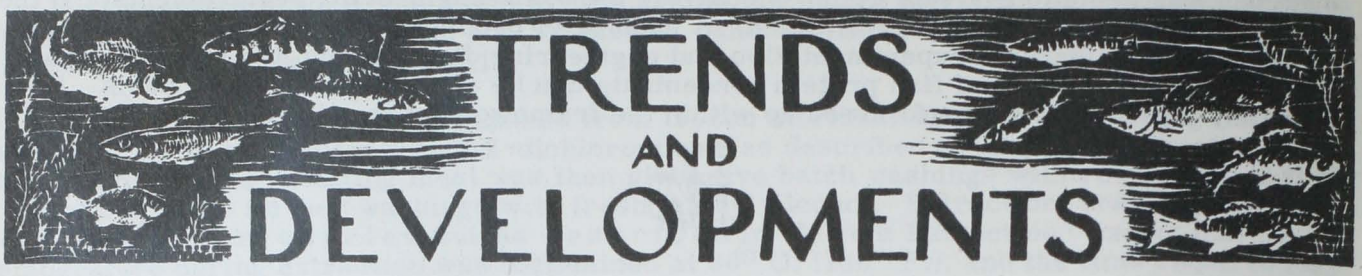


Alaska

FOREIGN FISHING ACTIVITIES IN WATERS OFF ALASKA AS OF AUGUST 1963:

Soviet trawl-fishing operations in the Gulf of Alaska increased to more than 150 vessels this year. All observations by U. S. Bureau of Commercial Fisheries personnel indicate the Soviets are fishing primarily Pacific ocean perch with very little halibut or other incidental species included in the catches, according to an August 27, 1963, news release from the Bureau's Alaska Regional Office at Juneau.

Additionally, the Soviets operated three king crab fleets in the Bering Sea from March until June, when they shifted operations of two of the fleets into the Gulf of Alaska about 100 miles southeast of Kodiak Island. After fishing there briefly with excellent success, the fleets returned to waters off Siberia and engaged in the saury fishery off the Kurile Islands.

Four Soviet whale fleets have operated intermittently in waters off Alaska during the summer. The swift whale killer vessels have been reported in violation of Alaska territorial waters several times in pursuit of whales. The four whaling fleets constitute the largest Russian whaling effort in the North Pacific and Gulf of Alaska to data.

The total Japanese fishing effort in the eastern North Pacific is somewhat reduced from last year. In 1962 the Japanese in the eastern Bering Sea operated four factoryships and an estimated 112 trawlers, catching fish for reduction and processing fish meal and oil. It is believed that dwindling catches and high costs of operation have caused the Japanese to reduce the fish-meal operation to the August level of a single factoryship and 30 trawlers.

The Japanese shrimp operations in 1962 consisted of three factoryships and 38 trawlers operating within a radius of 100 miles of the Pribilof Islands. The three fleets took almost 40 million pounds of shrimp. In 1963, two shrimp factoryships and 26 trawlers returned to the same general area north of the Pribilofs and are enjoying excellent shrimp fishing.

A Japanese king crab fishery has operated for the past several years in the eastern Bering Sea off Port Moller. Efforts in 1963 were reduced to two factoryships accompanied by four trawl-type tangle-net setting vessels. Last year, the Japanese operated four factoryships and 19 trawler-type vessels. A proposal to shift king-crab operations to the Gulf of Alaska apparently has been abandoned by the Japanese this year.

Whaling activity in 1963 by the Japanese remained at the same level as last year. Three factoryships, each accompanied by seven killer vessels, operated in waters off Alaska. One fleet remained in the western Aleutian area throughout the season. However, the other two fleets moved south and east as far as the vicinity of Prince of Wales Island, representing the farthest south and east penetration of any large foreign fleets to date. Like the Russians, the Japanese whale killers have been reported in violation of the three-mile territorial sea limit on a number of instances.

The 1963 fishing season has marked a new high in patrol efforts of the U. S. Coast Guard and U. S. Bureau of Commercial Fisheries in waters adjacent to Alaska. Joint Coast Guard and Bureau enforcement responsibilities for several International Treaties coupled with increasing foreign fishing activities in waters off Alaska have prompted a substantial increase in patrol and surveillance efforts over previous years.

* * * * *

BRISTOL BAY SALMON SEASON:

Bristol Bay with a catch of 2.5 million red salmon during the 1963 season experienced the lowest catch ever recorded for that area, according to a July 1963 report. The previous low was in 1958, when the catch totaled 2.9 million fish. The escapement for the entire Bristol Bay area was estimated at 3.2 million reds for a total run of approximately 5.7 million fish. The run produced 203,700 cases of canned salmon as compared to 926,400 cases in 1961 (the largest pack during the last 10 years).

The salmon fishing industry in Bristol Bay supports practically the entire economy of the villages of Dillingham, Naknek, King Salmon, and others. Approximately 3,500 persons are affected. Alaska's Governor and congressional delegation asked the President to declare Bristol Bay a disaster area. The U. S. Department of the Interior has instructed the Alaska Field Committee to cooperate with the State in exploring means of helping the people of the area.

* * * * *

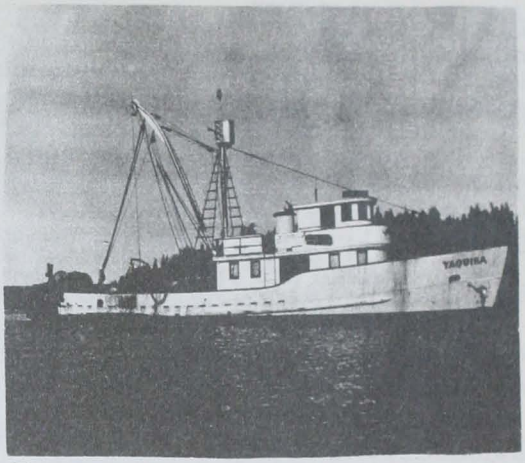
KODIAK FISHERIES:

The Kodiak area at the end of July 1963 was about to break production records again. The catch of king crab for the 1962/63 season (July 1-June 30) totaled 36,793,000 pounds as compared with the 1961/62 total of 28,649,000 pounds. The Dungeness crab catch last fiscal year was reported to have totaled 545,800 pounds, about the same as the previous year. The razor clam catch this season was up 100,000 pounds over last year with a total of 424,000 pounds reported.

Alaska Exploratory Fishery Program

M/V "YAQUINA" BEGINS SHRIMP EXPLORATIONS:

The M/V Yaquina is under charter to the U. S. Bureau of Commercial Fisheries for the second consecutive year for exploratory fishing in the Gulf of Alaska. Primary emphasis during the 1963 season is to be on shrimp explorations in the North Central Gulf of Alaska. One cruise started operations in the Montague Island (Prince William Sound) area. Through July 1963, trawling was carried on westward to Nuka Bay (near Seward). Shrimp were not taken in commercial amounts at any of the areas fished. Results of test fishing to that date indicated a widespread dispersal of side-stripe and pink shrimp with neither species evident in dense concentrations at any location sampled. The Seward-based commercial shrimp vessels continued to take large catches (60,000-100,000 pounds) during short trips to Kodiak Island. The Yaquina was expected to continue working to the westward with port calls scheduled for Seldovia and Kodiak during August 1963.



The 75-foot Yaquina chartered by the Bureau of Commercial Fisheries to conduct exploratory fishing surveys in Alaskan waters.

Alaska Fisheries Investigations

NAKNEK RED SALMON SMOLTS HIGHEST ON RECORD:

About 14.5 million red salmon smolts left the Naknek River by July 23, 1963, constituting the greatest number since the smolt enumeration project started eight years ago, according to the U. S. Bureau of Commercial Fisheries Auke Bay Biological Laboratory. The two-check fish produced from the 1960-brood spawning escapement constituted 64 percent of this year's smolt migration. Only 35 percent were one-check fish from the 1961 escapement. This is the first time that the two-check smolts have been in greater numbers than the one-check fish for the Naknek system. The Karluk red smolt migration was about 1,540,000 fish, or about the same as for the previous two years. The Ugashik outmigration is estimated to have been 33 million smolts. The production from the large escapement of 1960 (2.3 million adults) now totals 30 million smolts.

* * * * *

AUKE LAKE ADULT RED SALMON RUN GOOD:

The 1963 Auke Lake spawning escapement of red salmon is about 6,400 fish with almost half of them being females. This large return to such a small lake (100 acres) supports the high but very gross estimate of 90,000 smolts leaving Auke Lake in 1961. These few years of salmon population statistics for Auke Lake are encouraging insofar as using the system for research.

* * * * *

SALT-WATER TEMPERATURES AFFECT PINK SALMON GROWTH:

Growth rates of captive juvenile pink salmon in Auke Bay were much different in July 1963 than in July 1962. In 1962, growth declined after early June, corresponding with rising salt-water temperature. In 1963, water temperatures were lower and a high growth rate continued into July.

Buffalofish

CERTAIN ANTIOXIDANTS LENGTHEN STORAGE LIFE OF FROZEN BUFFALOFISH PRODUCTS:

By retarding the development of rancidity, certain antioxidants are more effective in lengthening the cold-storage life of frozen buffalofish products. This finding is based on studies by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Ann Arbor, Mich. The frozen reconstituted product had been in storage for 27 weeks. Samples containing the antioxidant Tenox 2 had not developed detectable rancidity; those containing nordihydroguniretic acid were on the borderline of acceptability. Control samples were unacceptable after 12 to 13 weeks of storage.

The smoked buffalofish rib product had been in storage 13 weeks. Ribs treated with propyl gallate had developed no rancidity, but the development of mold could prove to be a limiting factor. Controls stored at approximately 37° F. became rancid within four weeks. The same products stored at 0° F. developed no rancidity. Pilot investigations along those same lines are being planned for frozen catfish.

California

STATE AGENCIES MOVE TO HALT FISH LOSSES FROM AGRICULTURAL PESTICIDES:

Recommendations for methods of preventing agricultural pesticides from killing fish were distributed in mid-August 1963 by the California State Department of Agriculture and the University of California Extension Service. The action followed a California Department of Fish and Game investigation of fish kills in the lower Sacramento Valley.

The California Department of Agriculture announcement warned persons using pesticides to avoid contamination of water in drains and streams in order to prevent possible injury to fish.

The University of California Extension Service released specific instructions for agricultural practices which will reduce the hazard to fish when endrin bait is used to control cutworms. Endrin is one of the pesticides which destroyed fish. (California Department of Fish and Game, August 17, 1963.)

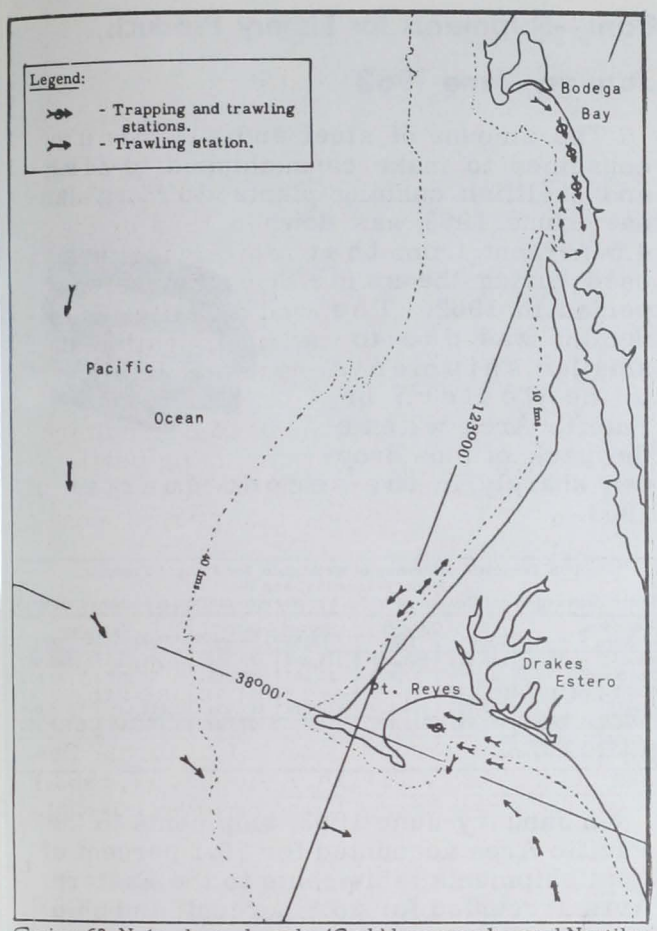
Note: See Commercial Fisheries Review, September 1963 p. 21.

* * * * *

GROWTH AND LIFE HISTORY OF DUNGENESS CRAB INVESTIGATED:

M/V "Nautilus" Cruise 63-N-1a, 1b, 1c, 1d, and 1e - Crab (January 7-12, 1963; February 4-9; March 4-9; April 1-6; May 6-11): To collect Dungeness or market crabs (Cancer magister) for growth studies and life history observations and to determine time of occurrence and relative abundance of crab year-classes were the objectives of this series of cruises by the California Department of Fish and Game research vessel Nautilus. The area of operations was in the coastal waters off central California from Bodega Bay to San Francisco.

Collections of crabs were made with a modified Gulf shrimp trawl with $1\frac{1}{4}$-inch mesh; 5 commercial-type crab traps; and seven 1-inch mesh crab traps. Trawling was done at each station. Tows lasted 20 minutes each and generally covered 0.75 miles. Crab traps were baited with squid and rockfish and fished overnight. Exploratory trawling was done where traps were not set. Stations were in 4 to 70 fathoms. Several stations were revisited each month.



Cruises 63-N-1a, b, c, d, and e (Crab) by research vessel Nautilus, showing some of the trawl and trap stations.

A total of 83 tows and 13 trap sets yielded 3,465 crabs--1,939 from Bodega to Point Reyes and 1,526 from Point Reyes to San Francisco.

Shoulder width measurements, taken in front of the 10th anterior-lateral spines, were made for all crabs. The 1961 year-class made up 81 percent (1,224) of the crabs sampled at Bodega and 50 percent (759) at San Francisco. The sex ratio at Bodega among the 1961 year-class was 1:1. At San Francisco, females made up 76 percent of the crabs measuring 86 to 145 millimeters (3.4 to 5.7 inches). Most crabs of the 1961 year-class remained in the 11th and 12th instars, 100 to 145 millimeters (3.9 to 5.7 inches), since September 1962. The 1962 year-class comprised 3 percent of the crabs at Bodega and 28 percent at San Francisco. Crabs 3 years old and older accounted for the rest of the sampling of those areas.

The crabs were also examined for hardness, for indications that females had carried eggs, and for mating marks on males. The mating marks result from close contact during the premating embrace and occur on the manus, carpus, and merus of the cheliped. The marks are such as might be made by a grinding wheel.

Mating activity was noted on the January cruise. A 166 millimeter (6.5 inches) male crab clutching a 109 millimeter (4.3 inches) female was taken in the net. Two males measuring 156 and 179 millimeters (6.1 to 7.0 inches) had two sets of mating marks. One set apparently made during 1962 and the second set during January 1963, indicated some of the crabs of that size do not molt for at least a year.

Leopard sharks (Triakis semifasciata) were noted as predators of small crabs. The stomachs of five leopard sharks 3 to 4 feet long were examined and one contained five crabs with a width measurement of 45 to 50 millimeters (1.4 to 1.8 inches).

In January and February, 45 percent of the females examined and carrying eggs or showed signs of having carried eggs. Of the egg masses examined in January, 75 percent had partly hatched.

Note: See Commercial Fisheries Review, March 1963 p. 20.

Canning

CAN-DRAINING DEVICE TO AID SAMPLE INSPECTION:

The Inspection and Certification Service of the U. S. Bureau of Commercial Fisheries has the responsibility for evaluating and passing upon the quality of fresh, frozen, and canned fishery products. To determine the amount of liquid present when sampling canned fish and shellfish, the inspector must drain the contents of the cans upon a screen and collect the liquid. Since a sample may consist of dozens of cans, draining several of them simultaneously would speed the work of sampling. Accordingly, a device to permit simultaneous draining was constructed. It has been used for several months and has been found (1) to speed up the work, (2) to be convenient, and (3) to be easily cleaned.

The purpose of this report is to describe its design.

The device consists of four main parts--a draining screen of No. 8 stainless steel

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 691

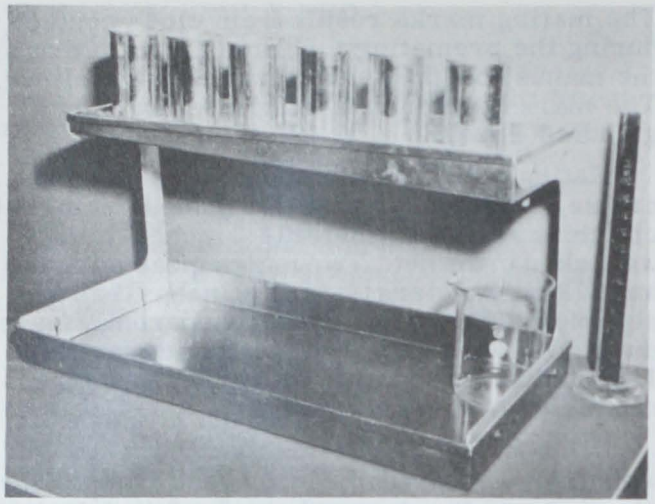


Photo of draining device assembled and ready for use.

mesh, a liquid collection tray of stainless steel, a base tray also of stainless steel, and two aluminum supporting brackets of $\frac{1}{8}$-inch plate. The brackets support the screen and the collection tray above the base tray. The collection and base trays are fitted at the ends with two brass buttons that drop into corresponding slots in the top and the bottom of the supporting brackets. The collection tray is sloped so that liquid flows toward a drain located at one end of the tray.

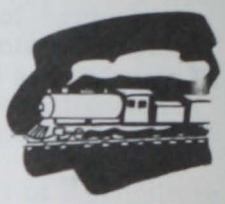
By lifting the liquid collection tray out of the slots in the top of the supporting brackets and removing the brackets from the base tray, the inspector can place all of the parts of the device in the base tray for storage.

The dimensions of the draining screen are $6\frac{3}{4}$" x $24\frac{3}{4}$". When assembled for use, the device is 12" wide, 26" long, and 12" high. When it is nested into the base tray, it is 12" x 26" x 2". The device as constructed will accommodate six No. 1 tall cans simultaneously. Dimensions may be altered if a different capacity of cans is desired.

--Lynne G. McKee, Food Technologist,
Technological Laboratory,
U. S. Bureau of Commercial Fisheries
Seattle, Wash.

Cans--Shipments for Fishery Products, January-June 1963

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-June 1963 was down 4.5 percent from that used during the same period in 1962. The decline was due to smaller shipments to the Western or Pacific Area where the pack of tuna dropped sharply in the second quarter of 1963.



U. S. Domestic Shipments of Metal Cans for Fishery Products, January-June 1963 and 1962
(Base Boxes of Metal Consumed in the Manufacture of Cans of Fishery Products)

Receiving Area	First Quarter		Second Quarter		Jan.-June	
	1963	1962	1963	1962	1963	1962
East[1/]	155,814	158,531	215,924	189,556	371,738	348,087
Southern	21,010	13,403	38,197	32,668	59,207	46,071
North Central	29	63	5	29	34	92
West[2/]	381,735	414,199	629,376	701,831	1,011,111	1,116,030
Total all areas	558,588	586,196	883,502	924,084	1,442,090	1,510,280

1/Includes Puerto Rico.
2/Includes Alaska and Hawaii.

In January-June 1963, shipments to the Pacific Area accounted for 70.1 percent of total shipments; shipments to the Eastern Area accounted for 25.8 percent; and shipments to the Southern Area accounted for most of the remaining 4.1 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 metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.

(2) See Commercial Fisheries Review, July 1963 p. 35.

Central Pacific Fisheries Investigations

DISTRIBUTION OF SKIPJACK TUNA AND OTHER LARGE FISH OF OPEN SEA:

M/V "Charles H. Gilbert" Cruise 67 (Boundary II) (July 1-August 4, 1963): To study the patterns of distribution of skipjack tuna and other large fish of the open sea in relation to water currents and water types

was the principal objective of this cruise by the research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

The study area was about 300 miles east of the island of Hawaii and was selected because it includes portions of two important central Pacific water types, California Current Extension and North Pacific Central waters. The boundary between those waters is believed to influence the distribution of the skipjack tuna (aku) on which Hawaii's largest commercial fishery depends. The vessel fished the study area with modified tuna long-line fishing gear and with live bait (tilapia). The catch of tuna and other species of fish was greater in California Current Extension water than in North Pacific Central water.

The effectiveness of modified 6- and 21-hook long-line gear for catching tuna was tested in the immediate vicinity of 150° W. longitude between 14° and 22° N. latitude. Four long-line stations were fished en route to and 12 in the designated study area; another station was fished on the return trip.

A total of 5 long-line stations were fished off the Kona coast of Hawaii to test the effectiveness of the modified tuna long-line gear. There were 20 baskets of 21-hook gear (2-fathom droppers) with 20-fathom floatlines, and 40 baskets of 6-hook gear (14-fathom droppers), 20 of which had no floatline and 20 with 10-fathom floatlines. There was an excessive amount of tangling (branch on mainline) when hauling the 21-hook gear. The fishermen also experienced some difficulty in setting the 21-hook gear. For the 5 stations off Kona, the 21-hook gear caught 0.23 fish per hundred hooks, while the 6-hook gear caught 0.58 fish per hundred hooks. Fish (Sciaenids and opelu) were used as bait on the 6-hook gear throughout the cruise, while squid and fish were alternately used on the 21-hook gear.

The association of skipjack and other fish with the northern boundary of the California Current Extension water was studied. In the study area of 150° W. longitude, 12 long-line stations were fished. These were located north and south of, and in the boundary between the California Current Extension water and North Pacific Central water. The boundary was identified from surface salinity observations made at about 30-mile intervals. The tuna catch in that area consisted of 1 albacore and 1 skipjack taken in Zone A (north of boundary); 8 big-eyed tuna, and 2 skipjack taken in Zone B (in the boundary); and 14 big-eyed tuna taken in Zone C (south of boundary). Mahimahi and large blue shark were caught in increasing numbers in going from north to south while the catch of Alepisaurus decreased. Of the 22 big-eyed tuna taken, 10 were caught on the 6-hook, 10-fathom floatline gear, 8 were taken on the 6-hook, 0-fathom floatline gear, and 4 were taken on the 21-hook, 20-fathom floatline gear.

Miscellaneous observations during Cruise 67 were as follows:

1. A total of 57 mahimahi (Coryphaena hippurus) were caught by pole-and-line using live bait (tilapia) under a floating log (Zone C). Twenty fish were sampled for length, weight, and sex. About 90 percent of the stomachs examined were empty (except for tilapia) and the remainder contained varying amounts of squid and flying fish.

2. Twelve surface plankton tows were made in the study area.

3. Five night-light stations were occupied during the cruise. One tuna postlarva was taken by dipnet at a night-light station off the Kona coast. Attempts to keep the larva alive failed.

4. All fish caught on the long-line and trolling gear were measured and their stomachs preserved.

5. A total of 15 samples of blood were collected from troll- and long-line-caught fish; 12 of those were from big-eyed tuna, 2 from skipjack, and 1 from a blue marlin.

6. A total of 20 bird flocks was sighted; 10 of those were sighted off the Kona coast. One was associated with a yellowfin school, but the species in the remaining schools were not identified. Of the 10 flocks sighted in the study area, 2 were associated with skipjack, 1 with yellowfin, and 1 with mahimahi. Species in the remaining schools were not identified.

7. A total of 1,000 drift cards was released in the study area and off the leeward coast of Molokai, Lanai, Maui, and Hawaii.

8. One skipjack, 3 mahimahi, and 2 wahoo were taken on the trolling lines.

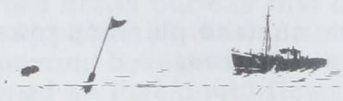
9. A canvas raft buoyed with four metal floats was attached to the end of the long-line. The raft was abandoned after being used at six long-line stations because it drifted considerably faster than the lines and caused the lines from several of the baskets at the end to become entangled. The raft did not increase the catch rate.

10. Two small-mesh gill nets, 12 feet long and 50 feet deep (mesh size $\frac{3}{5}$" and $1\frac{1}{2}$") were fished experimentally for the Albacore Ecology Program. Information on the setting and retrieving of those nets were relayed to the Chief, Albacore Ecology Program. No fish were taken in the nets. Fragments of jellyfish were found enmeshed in the $1\frac{1}{2}$" mesh gill net.

11. The theremograph and barograph were operated continuously whenever the ship was at sea.

12. Two mahimahi were brought back alive in the bait well and were transferred to shoreside-holding facilities.

Note: See Commercial Fisheries Review, May 1963 p. 25 and February 1963 p. 23.



Federal Purchases of Fishery Products

DEFENSE DEPARTMENT CHANGES PREAWARD INSPECTION PROCEDURES FOR OYSTERS:

The Defense Subsistence Supply Center (DSSC), Department of Defense, has issued a notice to the trade dated July 31, 1963, announcing a change in preaward inspection procedures for oysters.

Effective immediately, authority will not be granted for preaward inspection of oysters during the period June 1 through September 30, 1963, and until rescinded, during the same period in future years.

Preaward stocks packed prior to June 1 will be acceptable for delivery on DSSC contracts June 1 through September 30, 1963, and for that same period in future years. In addition, fresh-caught oysters will be acceptable during that period, with Veterinary Corps inspection performed after date of award, provided that laboratory analysis indicated that the Coliform Index does not exceed "most probable number (MPN) of 160,000 per milliliter."

* * * * *

DEPARTMENT OF DEFENSE DOES NOT BUY CANADIAN FOODS UNDER BUY AMERICAN ACT EXEMPTION AUTHORITY:

Recently there have been fishing industry inquiries regarding the relationship of Clause 14 (Buy American Act) on Standard Form 32 to purchases of food items of Canadian origin. A letter from the General Services Administration to the U. S. Bureau of Commercial Fisheries received in August 1963 explains as follows:

"Clause 14 on Standard Form 32 is designed, as you know, to implement the Buy American Act and Executive Order No. 10582, and is applicable to all executive agencies. The clause, as it currently appears on Standard Form 32, does not contain any reference to Canada.

"The Buy American Act confers authority directly on each agency to carry out the requirements of the Act. However, the Act also provides that purchases are exempt from the requirements of the Act where an agency head determines that the making of such purchases in accordance with the Act's requirements would be inconsistent with the public interest.

"The Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA) have exercised their exemption authority under the Act with respect to products of Canadian origin and, with certain exceptions, have exempted such products from the requirements of the Act. On the basis of these actions, DOD and NASA have supplemented the standard Buy American Act clause on Standard Form 32 by adding the words 'or Canada' to paragraph (a)(iii) of the clause following the words 'United States.' However, the General Services Administration and, to our knowledge, other executive agencies have not found it appropriate to make similar determinations.

"Although the Department of Defense has exempted most Canadian products, it has not extended the exemption to include food items. When food items are purchased by DOD, the language 'or Canada' is not included in the clause. On the other hand, while the National Aeronautics and Space Administration includes 'or Canada' in the clause when making purchases of food items, we understand that NASA's purchases of food items are very small.

"In the final analysis, with the exception of NASA, purchases of food items of Canadian origin by DOD, the General Services Administration, and other executive agencies, are not being exempted from the requirements of the Buy American Act and Executive Order No. 10582 and are being effected pursuant to the Buy American Act clause set forth in the September 1961 edition of Standard Form 32."

Fishermen

INTERIOR DEPARTMENT URGES RESTORATION OF PUBLIC HEALTH SERVICE BENEFITS TO SELF-EMPLOYED COMMERCIAL FISHERMEN:

The Department of the Interior in August 1963 recommended amendments to H.R. 3873 now before Congress which would permit certain owners of commercial fishing vessels to receive medical care and hospitalization without charge at hospitals of the Public Health Service.

The Department has submitted a draft bill to Congress aimed at restoring to self-employed seamen on fishing vessels the medical benefits they enjoyed prior to 1954.

Prior to 1954, self-employed fishermen were eligible for medical care in hospitals, out-patient clinics, and other medical facilities of the Public Health Service, but an administrative ruling by that agency in that year held

in effect that the term "employed" referred to services rendered in an employe status under a contract of hire. Subsequently, the regulations were changed to exclude the owner or joint owners of a vessel or the spouse thereof from receiving such medical benefits.

Interior's Assistant Secretary for Fish and Wildlife Frank P. Briggs informed Congress that the Department's draft bill would clearly provide that "seamen" include owners or joint owners of vessels and would include "self-employed" seamen among those eligible to receive medical benefits.

"Thus, the principal effect of our proposal . . . . . is to restore to all self-employed seamen the medical benefits enjoyed prior to 1954," Briggs wrote in a letter to Congress.

Briggs said that while the Department agrees "with the objectives of H.R. 3873, we believe that these can best be accomplished through our draft bill. Accordingly, we recommend enactment of H.R. 3873 in the form of our suggested draft bill."

H.R. 3873 would expand the authority of the Public Health Service Act to include commercial fishing vessel owners who accompany their vessels on fishing operations and substantially perform services comparable to seamen employed on such vessels or on vessels engaged in similar operations.

"We believe that the provisions of this bill (H.R. 3873) are too restrictive," Briggs wrote. "The bill would limit the benefits of the act to commercial fishermen alone and not include other self-employed persons who may be engaged on board a vessel in the care, preservation or navigation thereof. Further, it would require a finding that the self-employed person is engaged substantially in the care, preservation or navigation of a vessel before receiving the benefits of the act. We believe such a test would be difficult to meet in every instance and even more difficult to administer."

Briggs pointed out that generally owner-fishermen perform the same duties and engage in the same activities as do employe fishermen under a contract of hire. They face the same dangers and are subject to the same injuries and sicknesses as employe fishermen.

Frequently, he continued, adequate community hospital facilities are not available to them because of the transient nature of their work which takes them away from their home community health and welfare facilities.

"The legislative history of the hospital and medical care program for seamen suggests that the participation of the Federal Government in providing medical care to seamen rests primarily on a national interest in assuring an effective labor force which is necessary for an adequate merchant marine. Self-employed fishermen also add to this maritime labor force, since they have developed maritime skills necessary to all good seamen," Briggs said.

Fish Protein Concentrate

CONTRACT PROPOSAL FOR FISH PROTEIN CONCENTRATE RESEARCH IN INDIA:

"Studies on Nutritive Values of Fish Protein Concentrates," is the title of a contract proposal under Public Law 480. It was received in June 1963 from the India Council of Medical Research. The research is to be done by an Indian scientist at the Nutrition Research Laboratory in Hyberdad, India.

The work is to consist of animal and human feeding studies using fish protein concentrates manufactured by several different processes. The contract is to run for two years and the cost will about $49,000.

Contracts of this type are considered valuable from a research standpoint as data on fish protein concentrates is gathered from areas where there is a developing potential for a dietary protein supplement.

The contract proposal was the result of a visit to India by a technologist of the U. S. Bureau of Commercial Fisheries Technological Laboratory, Seattle, Wash.

Great Lakes Fishery Investigations

DEPTH DISTRIBUTION STUDIES OF CHUBS AND ASSOCIATED SPECIES IN LAKE MICHIGAN:

M/V "Cisco" Cruise 7 (August 13-27, 1963): The depth distribution of larval and adult chubs and associated fish species was studied during this cruise by the U. S. Bureau of Commercial Fisheries research vessel Cisco. The area investigated was in the Grand Haven-Saugatuck region of Lake Michigan.

Half-meter and meter plankton nets were towed at various levels from the surface to near bottom over 13 different bottom depths ranging from 3 to 50 fathoms. All larvae collected in those nets were alewives, except for three coregonids (chubs). Alewife larvae were caught in nearly all tows over bottom depths less than 40 fathoms, and in some tows out to 50 fathoms. They were most numerous in areas with bottom depths of 10 fathoms or less. In deeper water, most of the alewife larval were found in the upper levels. Coregonid larvae which were numerous in June, probably had grown large enough to escape the nets.

Five-foot and 9-foot square tow nets were fished at night at various levels over bottom depths of 10, 15, 25, and 40 fathoms. Both of those nets caught a few adult alewives, smelt, "bloater" chubs (Coregonus hoyi), and ninespine sticklebacks. None of the "bloater" chubs was

of the small size (1 to 7 inches) which was hoped might be taken with the nets. The 9-foot net also caught up to 30 alewife larvae per half-hour tow, but the 5-foot net caught very few of them.

Standard bottom trawl tows (10 minutes with a $\frac{3}{4}$-size North Atlantic whiting trawl) were made at 8 depths from 3 to 17 fathoms, and at 5-fathom intervals from 20 to 50 fathoms. From 2 to 6 tows were made at each depth sampled in the 3- to 17-fathom range (a total of 27 tows); single tows were made at 20 fathoms and deeper. Tows at 17 fathoms and deeper produced the usual summer catches for the area--mostly chubs (practically all "bloater" chubs), fair numbers of slimy sculpin, a few alewives, and, at 45 and 50 fathoms, rather large numbers of deepwater sculpin. The composition of catches at 15 fathoms and shallower changed during the cruise, probably because of pronounced changes in water temperature. Early in the cruise, with shallow-water temperatures mostly around 48° to 50° F., "bloater" chubs were fairly numerous in depths as shallow as 7 fathoms, and were present at 5 fathoms; yellow perch were common in depths as shallow as 5 fathoms, most abundant at 10 fathoms, and rare at 15 fathoms. Near the end of the cruise, after bottom temperatures at 10 fathoms and shallower had risen 10° to 15° F., "bloater" chubs and yellow perch were uncommon inside of 12 fathoms and 10 fathoms, respectively. Yellow perch were most numerous at 12 fathoms and common at 15 fathoms. Smelt, spottail shiners, and trout-perch also moved into deeper waters as the inshore water warmed.

The Bureau's Branch of Exploratory Fishing used the M/V Cisco during cruise 5 (July 2-16), and the vessel was under contract to the University of Wisconsin during cruise 6 (July 23-August 8). No reports on those cruises were issued by the Bureau's Biological Laboratory at Ann Arbor, Mich.

Note: See Commercial Fisheries Review, August 1963 p. 27.

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LAKE TROUT DISTRIBUTION STUDIES CONTINUED:

M/V "Siscowet" Cruise 5 (July 29-August 6, 1963): To compare the relative abundance of juvenile lake trout with previous years' catches at Isle Royale in Lake Superior, and to collect various forms of chubs from the north shore of Lake Superior for morphological and electrophoretic studies were the objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Studies during cruise 5 were at Isle Royale, Mich., and Thunder Bay, Black Bay, and Nipigon Bay, Ontario.

Small-mesh ($2\frac{1}{4}$-$3\frac{1}{2}$ inches) gill nets were fished north of Thompson Island, southeast of Menagerie Island, and south of Mott Island off Isle Royale. Juvenile lake trout appeared to be about as abundant as in 1958-61. A special set was made about 2 miles southeast of Mott Island, to collect biological data from a group of slow-growing lake trout which mature at lengths of 14-18 inches and spawn in mid-September, nearly a full month before the lean-trout spawning season. Blood samples for electrophoretic studies were collected from the various forms of lake trout taken at Isle Royale.

Other species caught in the gill nets during this cruise included "bloater" chubs (Coregonus hoyi) and two other species of chub (C. zenithicus and C. kiyi).

One 15-minute trawl tow in Siskiwit Bay yielded 175 pygmy whitefish and smaller numbers of sculpin, smelt, and yearling chubs.

A small gang of gill nets (2 nets each of $2\frac{1}{4}$- and $2\frac{1}{2}$-inch mesh) set at 20 fathoms between Pie and Welcome Islands in Thunder Bay caught 119 smelt, 1 lake trout, and 55 chubs. Most of the chubs were preserved for later study. The chub species Coregonus reighardi dymondi was believed represented in the chub collection from that area.

The work in Black Bay included the fishing gill nets (2 nets each of $2\frac{1}{4}$- and $2\frac{1}{2}$-inch mesh at 13-23 fathoms north of Irno Island, west of George Point, and west of Copper Point. Only small numbers of smelt, lake herring, and chubs were taken. The best catches of lake herring and chubs were made in the southern end of the Bay where the water was less turbid than in the more northerly locations. Two trawl tows at 15 fathoms between George Point and Copper Point yielded 150 smelt, 1 lake herring, and 1 yellow pike. Rough bottom prevented trawling in other areas.

Gill nets (mesh sizes, $2\frac{1}{4}$-$4\frac{1}{2}$ inches) were set in the Nipigon Bay region north of Anguros Island, north of Salter Island, Moffat Strait, and southwest of Simpson Island. The species and number of fish caught in each area are shown in the table on page 23.

Species Caught by Area, M/V Siscowet Cruise 5

Species	Location and Depth (Fathoms)			
	N. Anguros Island	N. Salter Island	Moffat Strait	S. W. Simpson Island
	15 Fm.	16-28 Fm.	16-17 Fm.	25-65 Fm.
	(No. of Fish)			
Chub	11	139	10	830
Smelt	22	48	2	-
Lake herring	7	22	27	-
Lake trout	5	5	5	8
Round whitefish	-	-	4	-
Burbot	-	1	-	-

Eighteen of the 23 lake trout caught were fin-clipped. Those hatchery-reared fish had been planted in the Rossport-St. Ignace Islands region in 1959-63. The physical characteristics of many of the chubs differed from those commonly taken on the south shore of Lake Superior. Many of the chubs were preserved for further study.

Two trawl tows at 27 fathoms, 3 miles north of Moffat Strait in Nipigon Bay, yielded 47 chubs, 123 smelt, 2 lake trout, and 4 sculpin. The lake trout caught in that area had been planted in the Rossport area in the spring of 1963.

Typical surface water temperatures at the various locations were: Isle Royale, 52° F.; Thunder Bay, 62° F.; Black Bay, 65° F.; Nipigon Bay, 61° F.; and Moffat Strait, 60° F.

Note: See Commercial Fisheries Review, September 1963 p. 28.

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SEA LAMPREY CONTROL BY CHEMICAL TREATMENT ENCOURAGING:

The sea lamprey at assessment barriers in Lake Superior at the end of May 1963 continued to show encouraging results from chemical treatments. The trend at that point near the end of the season, although 19 percent greater than the previous year's count, was 85 percent less than in 1961. The take of spawning-run sea lamprey was 9,952 compared with 8,369 in 1962 and 64,663 in 1961. The lamprey count at three "index" rivers in Lake Michigan was 7,425 as compared with 8,067 in 1962 and 12,886 in 1961. Comparison of lamprey catches with previous years in the three streams was nullified by the treatment of one of the streams during mid-May.

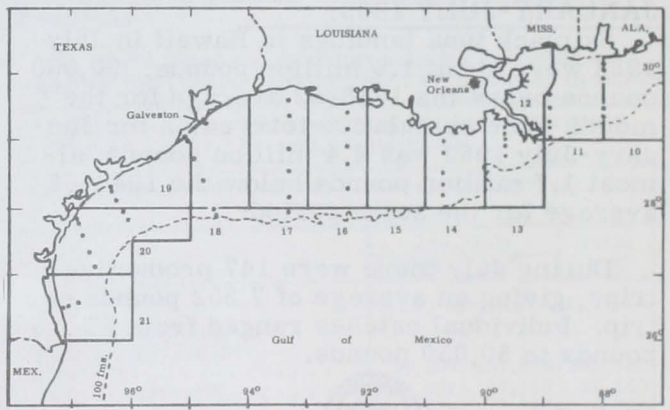
Note: See Commercial Fisheries Review, July 1963 p. 38.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-8 (August 16-31, 1963): The best brown shrimp catches were made in the 10-20 fathom depth range in 5 areas out of the 10 statistical areas worked during this cruise. The predominant size of brown shrimp caught was 15-20 (heads-off) count; white shrimp catches were relatively small, and sizes of these were variable from 15-20 count to very small shrimp counting over 68 to the pound.

Excellent fishing weather prevailed during this cruise by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Galveston, Texas. One 3-hour tow with a 45-foot shrimp trawl was made in each of the 3 depth ranges in all areas.



Shows the station pattern for the shrimp distribution studies in the Gulf of Mexico during Cruise 8 of GUS-III.

Shrimp catches were especially good in areas 16 and 18, each yielding about 125 pounds of mostly all brown shrimp principally from 10-20 fathoms, but with better than moderate catches from the other depth ranges.

The catch from area 10 totaled 91 pounds of 15-20 count shrimp, all of it from 2 depth ranges--up to 10 fathoms and 10-20 fathoms. In addition to brown shrimp, those depths also yielded 25 pounds of white and pink shrimp. The 3-hour tow made in the over 20-fathom range of that area was unproductive.

A total of 82 pounds was taken from area 20. All was brown shrimp except for 3 pounds of 15-20 count white shrimp from depths up to 10 fathoms. About 75 percent of the total catch in that area was in the 10-20 fathom depth range (60 pounds 21-25 count).

The only productive depth range in area 19 was 10-20 fathoms where 63 pounds of 21-25 count brown shrimp was caught.

Of the other 5 areas worked, area 17 yielded 44 pounds of large brown shrimp counting 12-15 to the pound caught in depths of 10 to over 20 fathoms, and 8 pounds of 21-25 count white shrimp from up to 10 fathoms. Shrimp catches in the remaining areas ranged from a low of only 3 pounds up to 30 pounds.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Sept. 1963 p. 29.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-JULY 1963:

Skipjack tuna landings in Hawaii in July 1963 were about 1.6 million pounds, 300,000 pounds below the 1948-62 average for the month. The cumulative total catch for January-July 1963 was 4.4 million pounds, almost 1.7 million pounds below the 1948-62 average for the same period.

During July there were 147 productive trips, giving an average of 7,352 pounds per trip. Individual catches ranged from 85 pounds to 50,050 pounds.

Industrial Fishery Products

STUDIES BEGUN ON PRODUCTION OF ANIMAL FEEDS FROM UNDERUTILIZED FRESH-WATER FISH:

Laboratory-scale studies on the production of fish and animal feeds from underutilized rice-fish farm species such as buffalofish, carp, and gizzard shad, were begun in August 1963 by the U. S. Bureau of Commercial Fisheries Technological Laboratory, Ann Arbor, Mich. Those coarse fish species contain the thiaminase (anti-vitamin B_1) factor, which is the subject of a study now in progress at the Laboratory. The thiaminase factor has caused considerable problems in the use of those coarse species in feeding work. Close coordination of the two studies will be maintained and will be aided by the procedure for quantitatively determining thiaminase activity recently developed by the Bureau's laboratory staff.

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U. S. FISH MEAL, OIL, AND SOLUBLES: Major Indicators for U. S. Supply, July 1963: United States production of fish meal in July 1963 was lower by 23.3 percent as compared with July 1962. Fish oil and fish solubles production also decreased by 38.3 percent and 14.0 percent, respectively.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, July 1963

Item and Period	1963	1962	1961	1960	1959
	(Short Tons)				
Fish Meal:					
Production 1/:					
September	-	31,165	28,642	36,239	36,874
August	-	38,955	57,031	49,709	47,364
July	40,317	52,574	62,586	55,696	52,132
January-June	90,156	114,375	109,140	90,939	91,473
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tot.	-	310,000	311,265	290,137	306,551
Imports:					
September	-	13,698	13,941	9,487	9,224
August	-	28,253	19,026	8,340	5,695
July	-	25,857	18,710	13,131	4,303
January-June	181,934	140,886	107,463	66,375	101,421
January-December	-	252,307	217,845	131,561	133,955
Fish Solubles:					
Production 3/:					
September	-	12,009	11,415	12,367	25,651
August	-	15,833	19,603	16,891	30,378
July	19,061	22,165	21,870	20,208	33,133
January-June	40,484	49,236	37,953	39,291	63,315
Jan.-Dec. prelim. totals	-	120,886	109,018	106,361	176,913
Jan.-Dec. final tot.	-	124,334	112,241	98,929	165,359
Imports:					
September	-	178	263	38	1,732
August	-	422	318	180	4,718
July	-	306	708	96	4,938
January-June	2,439	4,290	1,219	2,518	9,825
January-December	-	6,308	6,739	3,174	26,630
	(1,000 Pounds) 5/.				
Fish Oils:					
Production:					
September	-	30,723	24,988	30,530	22,383
August	-	33,526	50,749	38,052	30,043
July	28,744	46,608	58,533	41,362	32,108
January-June	69,788	92,864	87,298	53,101	62,077
Jan.-Dec. prelim. totals 4/	-	257,131	259,400	206,848	189,240
Jan.-Dec. final tot.	-	255,808	266,670	215,861	193,324
Exports:					
September	-	219	9,521	13,959	8,469
August	-	33,272	13,304	1,395	18,367
July	-	128	4,421	40,603	28,276
January-June	97,806	63,005	68,128	52,838	49,358
Jan.-Dec. totals	-	123,050	122,486	143,659	144,481

1/Does not include crab meat, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
5/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
Note: Data for 1963 are preliminary.

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Production by Areas, August 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for August 1963 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, August 1963 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized[3]
	Short Tons	1,000 Pounds	Short Tons	Short Tons
August 1963:				
East & Gulf Coast	38,442	29,638	16,141	762
West Coast[2]	4,894	2,862	2,485	-
Total	43,336	32,500	18,626	762
Jan.-Aug. 1963 Total	174,009	131,032	71,799	7,134
Jan.-Aug. 1962 Total	207,175	172,986	81,014	8,065

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.
Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

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Production, July 1963: During July 1963, 37,950 tons of fish meal and 29.4 million pounds of oil were produced in the United States. Compared with July 1962, this was a decrease of 17,652 tons or 31.7 percent in meal and scrap production, and a decrease of approximately 18.3 million pounds or 38.4 percent in oil.

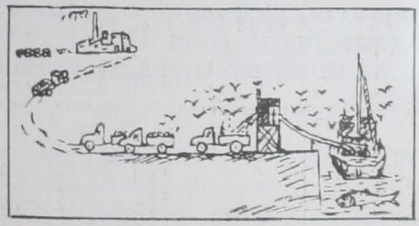

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, July 1963 1/with Comparisons

Product	July		Jan.-July		Total
	1/1963	1962	1/1963	1962	1962
	(Short Tons)				
Fish Meal and Scrap:					
Herring	2,111	1,555	2,726	2,696	5,095
Menhaden 2/	31,278	48,203	99,806	137,975	238,680
Sardine, Pacific	-	-	9	648	702
Tuna and mackerel	1,282	2,148	11,651	17,116	26,559
Unclassified	3,279	3,696	14,101	19,003	27,297
Total	37,950	55,602	128,293	177,438	298,333
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	12,899
Grand total meal and scrap	3/	3/	3/	3/	311,232
Fish solubles:					
Menhaden	13,188	18,234	39,924	48,509	84,885
Other	1,640	2,773	10,209	17,156	28,353
Total	14,828	21,007	50,133	65,665	113,238
Homogenized condensed fish	2,531	1,200	6,372	8,020	11,096
	(1,000 Pounds)				
Oil, body:					
Herring	2,064	1,717	2,426	2,602	5,255
Menhaden 2/	25,316	43,902	89,917	132,192	237,815
Sardine, Pacific	-	-	-	148	167
Tuna and mackerel	379	531	2,043	2,703	5,175
Other (including whale)	1,625	1,540	5,302	5,649	7,396
Total oil	29,384	47,690	99,688	143,294	255,808

1/ Preliminary data.
2/ Includes a small quantity of thread herring.
3/ Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Menhaden meal showed a decrease of 16,925 tons or 35.1 percent, while menhaden oil (25.3 million pounds) was 42.3 percent less than in July 1962.

A total of 14,828 tons of fish solubles was manufactured in July 1963--a decrease of 29.4 percent compared with the same month in 1962. Production of homogenized condensed fish amounted to 2,531 tons--an increase of 1,331 tons or 110.9 percent.

The quantity of fish meal processed during the first 7 months of 1963 amounted to 128,293 tons--49,145 tons less than in the same period of the previous year. Fish solubles and homogenized fish production totaled 56,505 tons--a decrease of 17,180 tons. Production of marine-animal oil amounted to 99.7 million pounds--a decrease of 43.6 million pounds.

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U. S. FISH MEAL AND SOLUBLES:

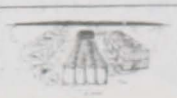
Production and Imports, January-July 1963: Based on domestic production and imports, the United States available supply of fish meal for January-July 1963 amounted to 353,450 short tons--9,269 tons (or 2.7 percent) more than during the same period in 1962. Domestic production was 128,293 tons (or 27.7 percent) less, but imports were 58,414 tons (or 35.0 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 167,542 tons.

The United States supply of fish solubles (including homogenized fish) during January-July 1963 amounted to 59,274 tons--a decrease of 19,007 tons as compared with the same period in 1962. Domestic production and imports dropped 23.3 percent and 39.8 percent, respectively.

U. S. Supply of Fish Meal and Solubles, January-July 1963 with Comparisons

Item	Jan.-July		Total
	1/1963	1962	1962
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	99,806	137,975	238,680
Tuna and mackerel	11,651	17,116	26,559
Herring	2,726	2,696	5,095
Other	14,110	19,651	40,898
Total production	128,293	177,438	311,232
Imports:			
Canada	30,752	27,232	42,806
Peru	167,542	123,859	186,249
Chile	19,088	7,157	9,247
So. Africa Republic	4,826	7,984	10,084
Other countries	2,949	511	3,921
Total imports	225,157	166,743	252,307
Available fish meal supply	353,450	344,181	563,539
Fish Solubles:			
Domestic production 2/	56,505	73,685	124,334
Imports:			
Canada	1,541	795	1,335
Iceland	-	2,205	2,332
Other countries	1,228	1,596	2,641
Total imports	2,769	4,596	6,308
Available fish solubles supply	59,274	78,281	130,642

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



Irradiation Preservation

ANOTHER IRRADIATED FISHERY PRODUCTS MARKET RESEARCH STUDY:

A market research study on the future orderly marketing of irradiated fishery products is to be made by the U. S. Bureau of Commercial Fisheries for the Atomic Energy Commission (AEC). The study stems from AEC's interest in low-dose radiation food preservation development and a determination of the conditions under which radiation-processed fishery products should be marketed in order to provide the greatest overall benefits to the fishing industry--from producer-processor-distributor to the consumer.

The new project with AEC, for which an agreement has already been prepared, will consist of a two-phased market research program. The objective of the first phase will be to elaborate further on a 1960 marketing feasibility study, and it is expected that the results of this phase will enable the Bureau to compare present losses involved in marketing fresh fishery products with the potentially fewer losses accruing from the advantages of the radiation-pasteurization process. In addition, this phase of the study should also help in an evaluation of the impact of radiation pasteurization on market supplies, methods of marketing, and structure of markets for certain fishery products.

The second phase of the program involves a pilot study of attitudes and reactions of potential consumers of irradiated fishery products. The results will enable the Bureau to determine the procedures and methods of presentation required for an effective consumer education program which will condition the public to radiation pasteurization of fishery products as a coming thing, and a forward step in food technology.

In 1960, the Bureau's marketing specialists completed a project for AEC called "Marketing Feasibility Study of Radiation Processed Fishery Products," which was quite successful, and provided much new and valuable information that contributed greatly to the advancement of the radiation-processed foods program. The Bureau's marketing specialists at that time discussed the feasibility of marketing fishery products with fish producers, processors, and distributors, along with retail food groups and consumer specialists such as newspaper food editors and extension people. A comprehensive analytical report giving the results of the study was submitted to AEC in November 1960.

Note: See Commercial Fisheries Review, December 1960 p. 37.

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RESEARCH ON FISHERY PRODUCTS SUPPORTED BY ATOMIC ENERGY COMMISSION:

Fishery products continue to play an important role in the Atomic Energy Commission's (AEC) program on radiation and pasteurization of foods. Technological laboratories of the U. S. Bureau of Commercial Fisheries at Gloucester (Mass.), Seattle (Wash.), and Ann Arbor (Mich.), are already conducting investigations on the application of radiation to fish and seafoods. But AEC's support of studies on fishery products is not, however, limited to work in the laboratories mentioned. It also includes the new Marine Products Development Irradiator facility at Gloucester which is located adjacent to the Bureau's technological laboratory there. The fishery products irradiator is being built to demonstrate the feasibility of extending the refrigerated storage life of fresh fishery products as a part of the AEC radiation-pasteurized food program. AEC also has awarded a contract to a New York Engineering firm for the conceptual design of a shipboard irradiator, and is sponsoring research on seafoods at the Massachusetts Institute of Technology, University of Washington, and Louisiana State University.

Some of the more significant research findings obtained by midyear of 1963 on the application of radiation to fishery products indicate that (1) the edible shelf life of haddock, ocean perch, clams, shrimp, king crab, and flounder can be extended to at least 30 days when irradiated to levels from 100,000 to 450,000 rads and stored at 33° F., (2) the amino acids and B vitamins of fishery products are not adversely affected by irradiation, (3) some strains of bacteria may be more resistant to irradiation than others and, (4) it may be possible to use gas chromatographic techniques to measure development of off-odors or flavors in long-stored irradiated seafoods. In addition to the above research program, the AEC is conducting toxicological and microbiological studies that will provide data for Food and Drug Administration (FDA) approval of radiation pasteurization.

Developmental work on the commercial acceptability or irradiated fishery products

is planned to begin on completion of the Marine Products Development Irradiator in the fall of 1964. Its completion will be marked by an International Conference on Irradiation to be held at Boston and Gloucester, Mass. That facility will process 1,000 pounds of fish per hour at a level of 500,000 rads and will provide those fishery products to industry and consumer groups for large-scale evaluation. It is anticipated that FDA approval of low-level radiation may be realized in a few years, and that industry will then start to gradually promote and market irradiated fishery products. At the same time, the Bureau of Commercial Fisheries will continue with more fundamental studies on irradiation designed to open up the use of this process to other fish species, and to establish methods of irradiating fish aboard vessels and re-irradiating them ashore for commercial distribution to inland areas.

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.

Note: See Commercial Fisheries Review, Sept. 1963 p. 33.

Michigan

PINK (HUMPBACK) SALMON EXPECTED TO REAPPEAR IN LAKE SUPERIOR STREAMS:

Sport fishermen in the State of Michigan may unexpectedly come up with pink salmon in their creels during this fall's extended trout season in Lake Superior streams.

Michigan's Department of Conservation is cooperating with other State and Federal agencies to collect information on runs of pink (humpback) salmon which were expected to follow their odd-year cycle of spawning runs in tributaries of Lake Superior this September and October. With the help of sport fishermen, who are urged to report any pink salmon caught, the agencies hope to learn whether this salt-water species has adapted itself to a new home in Lake Superior. In recent years, there have been growing signs that pink salmon are reproducing and extending their range in those waters.

A 13-inch "humpback" was caught at the mouth of the Falls River in Keweenaw Bay this past May--the first reported catch of a pink salmon from State of Michigan waters. Since 1959, nine other known catches of pink salmon have been made in Lake Superior streams in Minnesota and Ontario.

The origin of pink salmon in Lake Superior is linked to an accidental release in 1956 of young salmon from a hatchery at Port Arthur, Ont., Canada. Catch records indicate that the second generation of the escaped fish spawned successfully in 1961. Pink salmon mature and spawn in their second year, and then die. As a result, spawning runs occur only every other year. The third generation of the accidentally-released salmon should complete its two-year life cycle by spawning in Lake Superior's tributary streams.

The male pink salmon can best be identified by its prominent hump located just forward of the top or dorsal fin. This hump is less obvious in the female which might pass for an odd brown trout because of its color pattern. The tail of the male and female is usually marked with large rectangular black spots which measure up to one-half inch long. (Department of Conservation Official News Bulletin, August 22, 1963.)

Mussels

DECLINING HARVEST FROM TENNESSEE RIVER INVESTIGATED:

A full-scale investigation of the declining mussel harvest from the Tennessee River was started in mid-1963 by the Fish and Wildlife Branch of the Tennessee Valley Authority (TVA) in cooperation with other State and Federal agencies. The $80,000 study is aimed at preserving a small but colorful industry which provides employment for about 1,000 men. In 1962, the Tennessee River mussel harvest amounted to only 4,700 tons, down sharply from the average annual harvest of 10,000 tons between 1945-1955.

Since 1955, nearly all of the mussel shells have been shipped to Japan's cultured pearl industry, where a fragment of mussel shell inserted into an oyster forms the base of each pearl produced. The Japanese have found no satisfactory substitute for the Tennessee River mussel. Even the same species from the nearby Cumberland River are considered inferior. As a result, diggers have been paid as much as $180 a ton for Tennessee River shells.

There is considerable evidence that the harvest has been far greater than natural reproduction could replace. Pollution and dis-

ease also have been suspected. But more exact information is needed to guide an effective improvement program.

The current study was designed to learn the size and character of the Tennessee River mussel population, the number of species, age distribution, and what sort of bottom conditions they prefer. An attempt will be made to chart the life histories of the two most valuable mussel species. The young larvae, of microscopic size, undergo a metamorphic stage while attached as parasites to fish, then grow to useful size in about 10 years. Each mussel species has a particular kind of host fish, and the host fish for the most valuable species of mussel are still unknown.

The U. S. Bureau of Commercial Fisheries has agreed to examine Tennessee River mussels for evidence of disease or pollution damage, and for the condition of their reproductive organs. A water quality survey on Hales Bar and Guntersville reservoirs by the TVA Health and Safety Division, and data from four U. S. Public Health Service monitoring stations on the river, should indicate whether any fault in water quality is hampering mussel reproduction and growth.

Other organizations cooperating in the study are the Alabama Conservation Department, Kentucky Wildlife Resources Department, Tennessee Game and Fish Commission, and Tennessee Shell Company.

If the problem is simply overharvesting, then State regulation may be the only action needed, but if something has gone wrong with the mussel habitat the solution may be much more complicated. (Tennessee Valley Authority, Weekly News Letter, July 10, 1963.)

National Aquarium

SCIENTIFIC STUDY TEAM OUTLINES PLANS FOR NATIONAL FISHERIES CENTER AND AQUARIUM:

Age-old puzzles of why fish leap for a man-made lure one day and ignore it the next, how pollutants kill certain fish and permit others to survive, and how the temperature, salinity, and other conditions affect fish growth will be included in a wide range of scientific studies at the National Fisheries Center and Aquarium in Washington, D. C.

Such is the concept being developed by a group of leading marine scientists and aquarium experts who have made their first recommendations to Secretary of the Interior on features that should be included in an educational-scientific complex which will rank as the foremost laboratory of its type in the world. The eye-appealing surroundings will bring millions of visitors yearly to wonder at aquatic life.

The study group said the center as well as its equipment should feature the theme, "The Living World of Water," and that it should be designed to fill effectively a dual role of satisfying the general public demand while simultaneously encouraging educational and scientific advancement.

Members were enthusiastic about prospects for success of the project that is planned to repay the Federal Treasury its entire construction and maintenance cost over a 30-year period. They said aquariums throughout the world are enjoying increased popularity and agreed with the forecast that the new center in Washington should attract at least 3 million visitors a year.

Against a scientific background, the study group said, will be a series of carefully planned exhibits based on "The Living World of Water" theme and bringing to visitors a closeup view of hundreds upon hundreds of live specimens in near-natural surroundings. One such display, for example, would trace aquatic life in the Nation's largest river system, the Mississippi-Missouri from its birth in Yellowstone Park to full growth as it reaches the Gulf of Mexico.

Planners said visitors will be treated to a seemingly endless series of live displays featuring the antics of otters, porpoise, and sea lions; the horror of sharks, octopus, and great alligators; the charm and beauty of tropical fish; the great size of groupers and turtles; and the strangeness of lungfish, electric eels, four-eyed fish, and blind fish. One avenue of tanks will emphasize salt-water life, another fresh-water specimens.

Pointing out that Washington is the center of medical knowledge in the United States, the advisory group said studies at the national aquarium can be coordinated ideally with those at public health research facilities, including laboratories engaged in cancer research.

Many other fishery-based research projects are envisioned for the center. Typical ones would include the effect of water salinity and temperature on fish, the ability of certain fish to withstand pesticides and other harmful chemicals, the reaction of various fish to sudden changes in surroundings, types of food that promote growth and stamina, development of superior strains of commonly known sport and commercial fish, and more effective ways for tagging aquatic life to trace migrations and survival rates.

A center dedicated to "The Living World of Water," said the study team, "can be a unique institution that will provide opportunities for research that cannot be undertaken elsewhere; it will serve as a national and international center for research in marine and fresh-water biology."

The center is to be at Hains Point in East Potomac Park in Washington. It will be bounded by waters of the Potomac River on one side and the Washington Channel on the other.

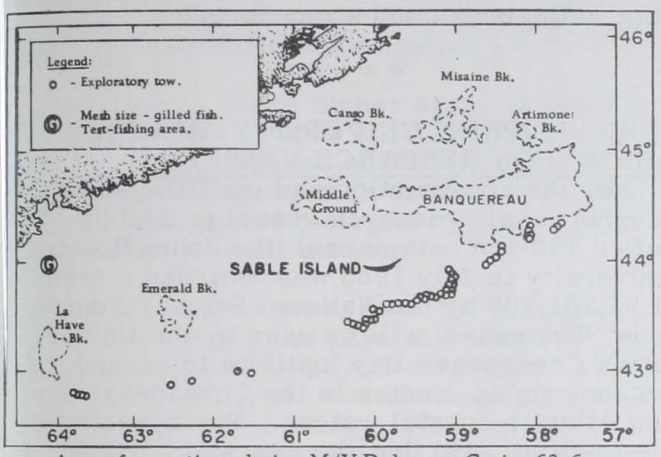
Note: See Commercial Fisheries Review, July 1963 p. 45.

North Atlantic Fisheries Exploration and Gear Research

OCEAN PERCH CONTINENTAL SLOPE EXPLORATIONS:

M/V "Delaware" Cruise 63-6 (July 9-20, July 29-August 9): Extending Continental Slope explorations for ocean perch off the New England coast was the principal purpose

of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The area fished extended the slope explorations to a point south of the easternmost portion of Banquero; dragging was discontinued just prior to reaching the "Stone Fence" area.



Area of operations during M/V Delaware Cruise 63-6.

The best catch-rate achieved during the cruise was 3,186 pounds of ocean perch in a 45-minute drag. The depths fished during this drag were from 215 to 245 fathoms. The position where the catch occurred was about 54 miles southeast (magnetic course) from East Point on Sable Island. (Loran positions for the drag were: Hook-up 1H1-2640, 1H2-3284; Knock-out 1H1-2642, 1H2-3272.) Fish in the catch were of excellent condition; no spots or "buttons" were observed. The average length of the fish were approximately 13 inches; the average weight was slightly under $1\frac{1}{4}$ pounds. The catch was very clean.

A total of 71 drags was made during the cruise. Of that number, 35 were 45-minute exploratory drags. An additional 10 drags were made for one hour and 6 others were made for longer than an hour in order to ascertain the size of the school of fish present. The remaining 20 drags comprised: 9 drags made to study mesh size and gilled fish ratios, 8 exploratory drags of durations other than those listed above, and 3 hang-ups.

A preliminary evaluation of the ocean perch exploration results to date indicate the absence of any large concentration of ocean perch in the slope area to the south of the Nova Scotian "Shelf;" however, small concentrations of fish are present which might sustain limited commercial fishing during periods when fish are scarce or unavailable on the regular commercial fishing grounds.

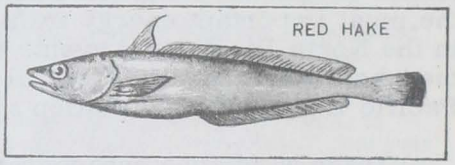
Note: See Commercial Fisheries Review, May 1963 p. 33.

North Atlantic Fisheries Investigations

FEEDING PERIODICITY OF GROUNDFISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 63-4 (June 19-25, 1963): To determine the feeding periodicity of several groundfish species and the possible changes in glycogen content of the liver was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. Trawling operations were conducted around the Block Island area on a 24-hour basis, and a total of 42 tows were made at 3-hour intervals. Over 2,000 stomachs from 8 species were examined and more than 500 fish livers were collected on this cruise.

Fishing stations were occupied in the Block Island area for 4 days to determine the periodicity of feeding, if any, and its relation to light or darkness, and tide. All of the species examined, including whiting (silver hake) and red hake, big and little skate, smooth and spiny dogfish, blackback flounder, longhorn sculpin, alewife, and several other species, appeared to have at least some degree of periodicity of feeding. All species collected in sufficient number throughout the day and night to enable preliminary statistical analysis of the data obtained showed clear signs of periodicity.



In addition, liver samples were obtained for glycogen analysis. Glycogen storage changes similarly indicated feeding periodicities.

The catch per-unit-of-effort significantly dropped at night to less than half that during daylight hours. Alewife, butterfish, whiting, and winter flounder were more vulnerable, or available, to the gear during the day. The first 3 species are known to migrate toward the surface at night but the winter flounder does not. It feeds most actively during the middle of the day at which time it is also most vulnerable to the net.

Oceanography

NORTH PACIFIC TRADE WIND ZONE OCEANOGRAPHY PROGRAM:

Although Hawaii is located within the North Pacific trade wind zone, the efforts in oceanography of the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries have hitherto not been specifically directed toward the study of the air-sea interactions and their effects on the sea in that region. Recent studies of the oceanographic climate of the Hawaiian Islands region has revealed that the southern boundary of the high salinity North Pacific Central water is seasonally displaced north-southward. These surface water displacements are believed to be associated with seasonal changes in the trade wind system.

Hawaii is located within the path of this seasonally-shifting water type boundary which also determines the success of the local skipjack tuna fishery. A study of the linkage mechanism between trade-wind system and surface-water movement is therefore of practical value to the Hawaiian fishery. Such a study, however, has much broader significance in that the trade wind zone is one of the most important energy transfer regions in the North Pacific and events there affect the whole North Pacific Central and North Pacific Equatorial circulation systems.

A trade wind zone oceanography program has been established at the Honolulu Laboratory to study the processes at the sea surface and their effects on the ocean. The new program in July 1963 was in the design and planning phase of an investigation which will lead to a two-year, multiple-ship field operation beginning in 1965. This is planned to become a cooperative venture of Government agencies concerned with the sea and others interested in trade wind zone problems. Preliminary cruises are planned for early 1964 by the Bureau's new research vessel now under construction.

As a result of the investigation, an understanding will be gained of the seasonally changing processes which govern the distribution of surface-water properties. Knowledge will be gained about the effects of the seasonally changing trade wind system on water motion, distribution of the surface mixed layer, and on the thermocline. Such new knowledge is, of course, basic to ecological studies, in addition to forecasting favorable or unfavorable fishing conditions with assurance in Hawaiian waters. Most far-reaching, however, the results will provide an important link in understanding the ocean-atmosphere heat engine mechanism which controls our climate and so will be a step closer to eventual forecasting of climatic trends both in the ocean and atmosphere.

* * * * *

JOHNS HOPKINS UNIVERSITY AWARDED GRANT FOR RESEARCH VESSEL:

For the construction and outfitting of an oceanographic research vessel (a double-hulled 150-ton catamaran), the Johns Hopkins University in July 1963 was awarded a grant of $1,291,200 by the National Science Foundation. The vessel will be used by the University's Chesapeake Bay Institute to expand its oceanographic studies in the Chesapeake Bay and Atlantic coastal waters. The Director of the Institute said that the new ship "will enable us to do work in the open bay itself in almost any weather conditions, and will also enable us to work offshore to the edge of the continental shelf.

"We plan to extend our operations up and down the coastline farther than is now possible."

The floating laboratory must be designed and built to exact specifications needed for Chesapeake Bay studies. In general, it will have an over-all length of 99 feet 5 inches, a displacement of 114 tons, and full load of 150 tons.

The six-foot shallow draft will allow operations in shallow inshore areas where conventional vessels cannot venture.

The research vessel will have a cruising speed of about 18 knots, and a range of 1,000 miles with 30 days' supplies and water aboard.

There will be space for a crew of 8 and adequate accommodations for 8 scientists.

The main deck laboratory, plus scientific office space, will be 500 square feet, with at least 700 square feet of open scientific working space.

Johns Hopkins scientists will spend the next year on detailed plans of design, and another year will be needed for construction

after tests have been made on the final design.

Explaining the need for construction of a vessel rather than the purchase of a conventional vessel, the Director of the Chesapeake Bay Institute said that the requirements for sea-keeping characteristics and roll stability for scientific investigation are critical.

In addition, much higher speed is required for coastal and inshore studies than for deep-sea research, because of the much more rapid time changes which occur in the physical, chemical, and biological properties of inshore and coastal waters.

Established 13 years ago, the Institute has been studying the physical, chemical, and biological oceanography of estuarine and inshore environments and has developed improved methods of using serial oceanographic observations to describe the physical and chemical properties of world oceans. In addition, the staff has carried out a program of graduate education and special training of oceanographers.

The Hopkins scientists now use their original research vessel, the Maury, only 65 feet long with a displacement of only 40 tons loaded.

The iron-hulled Maury is operated by a crew of 3 and accommodates only 4 scientists. The size and seaworthiness has limited the field operation of the staff, and weather limits its use on the Bay to approximately one-third of the year.

Oysters

MARYLAND SPATFALL OBSERVATIONS FOR 1963 CONTINUED:

Good sets of oysters generally continued in the Chesapeake Bay area through the mid-summer period, according to the August 22, 1963, "Oyster Report" from the Biological Laboratory of the State of Maryland, Solomons. The set in St. Marys River not only was the heaviest observed but was sustained over the longest period. Fair sets in Tar Bay and in Holland Straits, two important seed areas, occurred on test shells during the two weeks before August 22. In Eastern Bay and the Little Choptank a second wave of heavy setting occurred during the last week in July and first week in August. Upper Harris Creek and upper Honga River both received heavy sets during the last half of July and the first week in August.

The U. S. Bureau of Commercial Fisheries Laboratory at Oxford exposes test shells in Tred Avon River and in Broad Creek, Talbot County, the latter an important seed area. Their report shows that a good set occurred with two distinct waves of setting, one near the beginning of July and the second after mid-July. Test shells were first put out on June 13, 1963, in Tred Avon River and June 14, 1963, in Broad Creek. This year 24 shells were placed in each bag. The inner faces of 12 shells faced downward and the inner faces of the other 12 shells faced the surface. The bags were suspended just off the bottom in such a manner that this shell position was retained throughout the sampling period. New shell bags were suspended weekly and the counts recorded are the total spat found per 24 inner shell faces at each station.

In interpreting test-shell data it must be kept in mind that the figures show the potential set and not the commercial set on planted shells. The position of planted shells and the extent to which they become silt covered or fouled by growths of other organisms may greatly reduce the spat that can attach. Also the crowding of spat by one another as they grow will rapidly lower the count of heavy sets after they have attached.

Although the commercial set will not be evaluated until late fall it is apparent that quite high-count seed should be available in a number of areas in mid-summer. The week before August 22, observers of the Tidewater Fisheries Natural Resource Institute clam survey team brought in soft-shell clam (mannose) shells that were left on the bottom by hydraulic clam dredging in the Eastern Bay area. These were heavily encrusted with young oyster spat 1/4-inch or less in length. Quantities of these thin clam shells were reported on sandy shoal areas where they are likely to be buried by the first severe storm. If a way could be found of salvaging these they would make valuable seed.

In many regions seed oysters often are transplanted when only a few weeks old. Young spat crush easily and dry out quickly, but if handled carefully can be transplanted quite successfully at any time except just before or during the winter months when they are unable to make growth or adjust to their new positions. This year Maryland could make great gains in oyster production if some mechanism could be worked out for transplanting the heavily set young spat to good growing grounds at once or during early fall. If left in seed areas many will have died by spring and the survivors deformed by crowding.

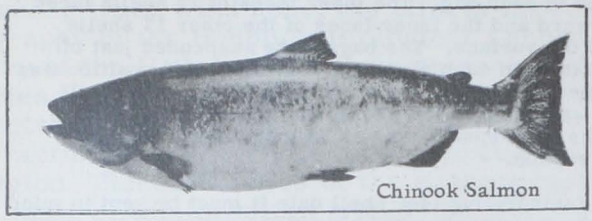
An advantage enjoyed by Maryland in using spat as seed is the lack of a drill problem except in parts of Somerset County and on the Seaside. Spat are so heavily fed upon by drills that it is useless to plant them where drills occur. The fact that most Maryland waters are drill free is one that should be capitalized upon through effective use of dense sets of young spat whenever they are available.

Salmon

COLUMBIA RIVER FISH HATCHERY EVALUATION PROGRAM:

Aerial-Ground Tabulation of Fall Chinook Sport Fishery: In mid-August 1963, the Columbia River fish hatchery evaluation program was expanded to include an aerial-ground tabulation of the sport fishery in the

Columbia River for fall chinook salmon. This is part of a 10-year evaluation program known as "Operation Fin Clip" being conducted by the U. S. Bureau of Commercial Fisheries and cooperating State agencies.



Chinook Salmon

The purpose of the program--which involves the marking of approximately 32 million fish over a 4-year period--is to evaluate the contribution made to the commercial and sports catch of fall chinook salmon by Columbia River hatcheries. The Federal Government, which contributes about $2 million annually for operation and maintenance of 22 State and Federal fish hatcheries on the Columbia and its tributaries, wants to find out how valuable they are to the total fish catch. State agencies cooperating in the program have trained observers stationed at key fishing spots along the Pacific coast from San Francisco, Calif., to Alaska to tabulate the marked fish as they are caught by commercial and sport fishermen.

Statistical sampling techniques used to study the Columbia River sport fishery during August and September 1963 included a count of fishermen in the following areas: (1) from the Interstate Bridge at Longview to Martin's Bluff, including the lower Cowlitz River; (2) from Martin's Bluff to the Lewis River mouth and up the Lewis River to the Lewis River Hatchery; and (3) the vicinity of Bonneville Dam.

Two observers in boats were assigned to each of the first two areas, and one to Bonneville Dam. In addition, an aerial observer in a chartered plane covered the three designated sampling areas and make a general survey of other areas of the Columbia River from Tongue Point to the Klickitat River above Bonneville.

The surface observers operating in boats distributed to fishermen in the sampling areas post card questionnaires issued by the Washington State Department of Fisheries. The questionnaires asked the fishermen to supply information regarding the time and location of their fishing activity and the numbers and kinds of fish caught.

Describing the study, a representative of the Bureau of Commercial Fisheries said, "Personnel of our Bureau and the State agencies have devised a statistically sound sampling schedule to determine the magnitude of the Columbia River fall Chinook salmon sport fishery and at the same time indicate the total number of fish which are being taken and the proportion of marked fish, so we can calculate the contribution made to this fishery by the various hatcheries."

In subsequent years, the survey will concentrate on additional areas of the Columbia River.

Note: See Commercial Fisheries Review, Sept. 1963 p. 45.

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MIDDLE SNAKE RIVER AREA FISHERIES IMPROVEMENT PROJECTS:

The construction of fishways, screening of irrigation canals, and clearance of stream obstacles in the Middle Snake River area in Idaho is an important part of the Columbia River Fishery Development Program of the U. S. Bureau of Commercial Fisheries. The Program is designed to improve salmon runs in the Columbia River and its tributaries under cooperative financial arrangements between the Federal Government and the States of Oregon, Washington, and Idaho. Salmon which are hatched in the Middle Snake region in Idaho make their way down the Columbia River to the Pacific Ocean and eventually return to their place of birth as adult spawners.

Major improvements in the Middle Snake River area include the Selway Falls fishway on the Selway River about 100 miles above Lewiston, Idaho, and the Lewiston Dam fishway on the Clearwater River at Lewiston, Idaho. At Lewiston Dam, a private power company, in cooperation with the Columbia River Fishery Development Program, is rebuilding outmoded fish ladders that were originally constructed in the 1920's. The total cost of the project is $200,000. At Selway Falls, a tunnel-type fishway is being constructed at a cost of about $250,000. It will pass fish around the falls which have been blocking the movement of Chinook salmon upriver. The two projects are expected to be completed in 1964.

The screening program in the Middle Snake area involves placing screens across irrigation canals to stop fish from entering the canals. The screens are equipped with either electrically-powered or water-driven scrapers

which operate like an automobile windshield wiper to keep the screens free of debris so water can flow through. A total of 166 screens have been installed in the Upper Salmon River Basin in Idaho since the program started 6 years ago. On the Lemhi River (a tributary of the Salmon River where 82 screens have been placed, the spring chinook run has improved from a meager handful of salmon a few years ago to at least 2,000 fish in 1962.

In the Clearwater River, there has been a vigorous clearance program to remove log jams and level minor falls which had impeded the progress of fish.

The over-all Columbia River Development Program has resulted in the construction of 56 fishways and 544 screens in Oregon, Washington, and Idaho. It has also provided financing for 21 fish hatcheries in the 3 states and led to the clearance of 1,500 miles of streams.

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, AUGUST 1963:

Item and Period	1963	1962	1961	1960	1959
	. . . . . (1,000 Lbs., Heads-Off)				
Total landings, So. Atl. and Gulf States:					
October	-	14,699	12,696	21,688	19,601
September	-	13,182	9,691	18,832	18,330
August	18,600	12,332	10,944	20,441	18,595
July	16,081	12,283	10,500	21,746	17,493
January-June . . .	39,000	32,111	31,030	36,775	35,511
January-December	-	105,779	91,396	141,035	130,660
Quantity canned, Gulf States 1/:					
October	-	4,454	2,065	2,480	2,324
September	-	1,727	598	2,222	1,936
August	2,900	1,333	1,090	4,427	2,228
July	4,244	3,551	2,793	5,802	2,833
January-June . . .	9,657	7,538	4,963	9,034	10,043
January-December	-	23,210	14,500	26,394	22,659
Frozen inventories (as of end of each mo.) 2/:					
October 31	-	21,315	17,811	31,209	33,057
September 30 . . .	-	12,843	13,361	24,492	26,119
August 31	3/	12,754	12,728	20,171	23,780
July 31	4/25,460	13,677	14,849	17,397	22,352
June 30.	4/24,047	13,796	19,416	15,338	19,283
May 31	4/25,114	13,904	24,696	17,540	21,137
April 30	4/24,954	15,637	27,492	20,502	23,331
Imports 5/:					
October	-	18,279	16,813	14,211	15,340
September	-	9,696	8,629	8,190	7,541
August	3/	7,381	6,743	6,406	5,107
July	11,002	8,265	6,635	7,319	7,861
January-June . . .	70,485	64,001	57,168	51,365	49,826
January-December	-	141,384	126,268	113,418	106,555
	. . . (¢/lb., 26-30 Count, Heads-Off). . .				
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
November	-	84.5	73.5	54.0	46.2
October	-	90.0	68.7	53.0	44.4

(Table continued on next column)

Item and Period	1963	1962	1961	1960	1959
	. . (¢/lb., 26-30 Count, Heads-Off) . .				
September	-	90.9	70.1	52.2	46.4
August	6/ 57-71	83.6	66.1	52.0	46.9
July	6/ 57-78	82.1	55.8	54.6	49.2
June	6/ 72-83	84.4	53.7	64.1	60.7
May	6/ 80-86	83.7	52.8	62.9	63.3
April	83.6	82.2	55.4	60.6	65.2
Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.:					
November	-	105-110	89-92	69-73	60-65
October	-	108-115	83-90	69-73	59-62
September	-	113-118	87-90	65-70	62-64
August	75-81	110-112	76-91	64-67	62-64
July	80-97	3/	70-75	72-77	62-74
June	95-102	102-104	67-72	76-77	73-74
May	98-103	96-103	67-69	74-77	70-76
April	100-105	94-97	69-70	74-75	75-82

1/ Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
2/ Raw headless only; excludes breaded, peeled and deveined, etc.
3/ Not available.
4/ Inventory of Apr. 30, 1963, includes 545,000 pounds; May 31, 1963, includes 553,000 pounds; June 30, 1963, includes 667,000 pounds; and July 31, 1963, includes 925,000 pounds for firms not reporting previously.
5/ Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
6/ Range in prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Texas, only.
Note: Data for 1963 are preliminary. August 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

Transportation

DIRECT RAIL SHIPMENT OF FROZEN FISH FROM SOUTHEASTERN ALASKA TO OTHER STATES:

Additional direct rail movements of frozen fish out of Alaska over the new car ferry linking Saxman (Ketchikan), Alaska, and the lower 48 states have been reported as of August 1963. A carload of frozen fish, which weighed over 61,000 pounds, moved from Saxman, Alaska, to Miami, Florida. Freight charges amounted to about 3.4 cents a pound. This is considerably lower than charges for shipments by water to Seattle and thence by rail to Miami.

Another car, containing over 82,000 pounds of frozen fish, also left Saxman bound for Cincinnati. This shipment was the second of its kind between those two points. Additional cars have moved to Chicago, Louisville, and other cities.

Tuna

BLUEFIN TAGGING PROGRAM OFF CALIFORNIA RESUMED:

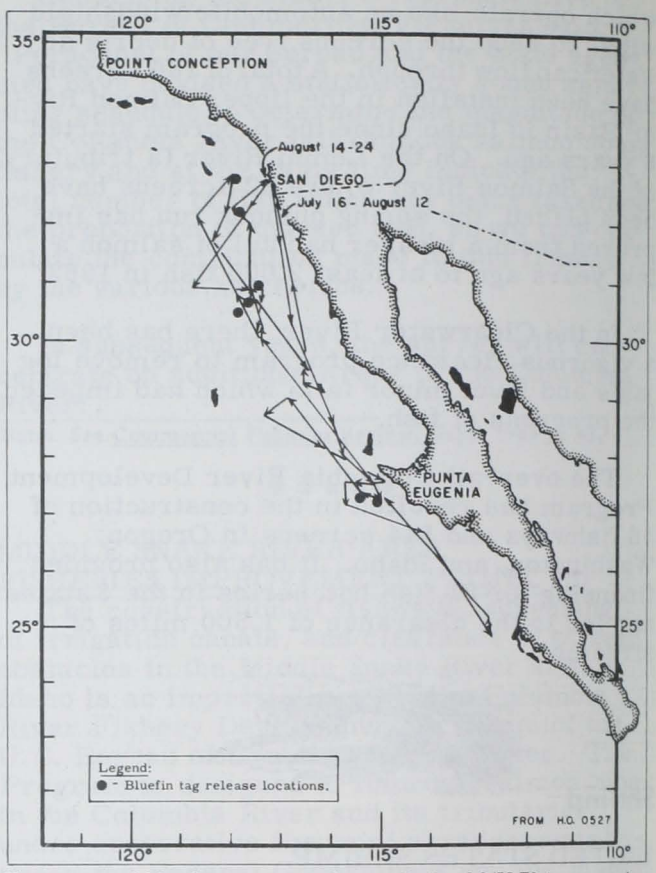
M/V "Elsinore" (July 16-August 24, 1963): The second of a series of annual tagging cruises designed to provide vitally needed information on the Pacific bluefin tuna (Thunnus thynnus), such as age, growth, movements, and vital statistics was completed by the chartered research vessel Elsinore. Specific objectives of this cruise included: (1) the tagging and release of bluefin tuna, (2) collection of serological materials for subpopulation analysis, (3) length-frequency samples of the individual catches, (4) collection of bathythermograph data relating catch success to thermocline depth and magnitude, and (5) collateral oceanographic and meterological observations. This latest cruise successfully extended the area of tag releases from Turtle Bay, Baja California, Mexico, to the Southern California offshore waters as shown in the chart.

The Elsinore was chartered by the U. S. Bureau of Commerical Fisheries Biological Laboratory at San Deigo in cooperation with the California Department of Fish and Game. It is a continuation of the pilot program carried out in August 1962 by the commercial purse-seiner West Point. That vessel was then chartered by the Bureau in cooperation with California's Department of Fish and Game.

A total of 543 bluefin tuna were tagged and released between July 19 and August 19, 1963, as shown in the table.

Blood samples (total of 342) were taken from individual bluefin tuna and transshipped to the Tuna Subpopulation Study group, the Bureau's Biological Laboratory, at Honolulu, Hawaii, for serological analyses.

Supplementary data obtained on this cruise included 69 bathythermograph casts at or near the time the purse seine was fished, length-frequency data from all catches, and daily synoptic marine meteorological observations at 0000, 1200, and 1800 Greenwich Mean Time.



Shows area of bluefin tuna tag releases during M/V Elsinore cruise, July 16-August 24, 1963.

Of particular interest this year was the difficulty encountered by the purse-seine fleet in successfully stopping schools of bluefin tuna once they were surrounded by the net. The Elsinore's experience on this cruise was typical of the commercial tuna-fishing fleet's experience--of 33 sets on schools which were known to be bluefin tuna, only 7 were successful in stopping the fish and holding them until

Bluefin Tuna Tag Release Data from M/V Elsinore Cruise, July 19-August 19, 1963

Date	Time (PDST)	Position		No. of Fish Released
		Latitude	Longitude	
July 19	6:34 - 6:55 p. m.	27° 10' N.	115° 10' W.	76
July 26	4:55 - 6:45 p. m.	27° 14' N.	115° 32' W.	112
August 10	2:30 - 5:50 p. m.	30° 43' N.	117° 43' W.	55
August 10	10:10 p. m. -12:10 a. m.	30° 27' N.	117° 47' W.	77
August 11	11:50 a. m. - 2:50 p. m.	31° 03' N.	117° 35' W.	122
August 12	7:55 -11:00 a. m.	32° 10' N.	117° 52' W.	37
August 19	3:00 - 5:55 p. m.	32° 48' N.	118° 03' W.	64
Total				543

the purse rings were hoisted aboard. All large schools of bluefin in the southern area of this year's fishery frequented very clear water, having such transparency that the fourth 5-fathom-deep strip of seine webbing could be seen below the surface when the net was fished. The schools appeared exceedingly wary and swerved away from the boat upon approach, requiring towline distances varying from 50 to 300 yards to close the gap between net and skiff (the M/V Elsinore fishes a net measuring approximately 485 fathoms long by 40 fathoms deep). Even when the towline was hauled and the fish were still inside the net, over half of the schools were lost as the fish sounded and went under the leadline during the pursing operation.

Of additional scientific interest were the following species taken by the purse seine: a pelagic sting ray (family Dasyatidae), hammerhead shark (Sphyrna lewini), silvertip shark (Carcharhinus platyrhynchus), blue shark (Prionace glauca), broadbill swordfish (Xiphias gladius), striped marlin (Makaira andax), dolphin (Coryphaena hippurus), sunfish (Mola mola), and frigate mackerel (Auxis thazard).

Scientific personnel aboard the M/V Elsinore during this cruise consisted of 2 fishery biologists from the Bureau's San Diego Biological Laboratory and 2 marine biologists of the California Department of Fish and Game.

Note: See Commercial Fisheries Review, December 1962 p. 50.

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BLUEFIN TUNA TAGGED IN NORTH ATLANTIC OFF CAPE COD RECAPTURED NEAR RHODE ISLAND COAST:

The second tag return from bluefin tuna tagged and released in the North Atlantic by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware was taken August 23, 1963, by a tuna purse-seine vessel operating off Block Island, R.I. The tuna was tagged and released 150 miles southeast of Cape Cod on June 8, 1963, along with 28 others of the same species, and traveled 145 miles to the northwest before its recapture 77 days later. In addition, three more tagged bluefin tuna are believed to have been recaptured by purse-seine vessels operating in the same area. Canning plants were alerted to watch for those fish in an effort to recover the tags.

The first tag return from the bluefin tuna released by the Delaware was found in a purse-seine catch 20 miles off Ocean City, Md., on June 27.

Note: See Commercial Fisheries Review, August 1963 pp. 36-40 and p. 53.

U.S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JULY 1963:

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, July 1963 with Comparisons

Area (Home Port)	July 1963	July 1962	Jan.-July 1963	Jan.-July 1962	Total 1962
	(Number)				
Issued first documents 2/:					
New England	4	5	14	20	28
Middle Atlantic	4	-	12	2	3
Chesapeake	9	2	31	23	43
South Atlantic	11	4	44	21	47
Gulf	20	9	135	62	110
Pacific	28	13	136	100	130
Great Lakes	-	-	3	1	5
Puerto Rico	-	-	3	-	2
Total	76	33	377	229	368
Removed from documentation 3/:					
New England	7	1	33	12	24
Middle Atlantic	12	-	39	26	39
Chesapeake	2	5	12	13	23
South Atlantic	3	4	37	22	38
Gulf	14	10	76	69	104
Pacific	9	3	60	72	111
Great Lakes	-	-	9	12	22
Hawaii	-	-	1	3	3
Puerto Rico	-	-	-	1	1
Total	47	23	267	230	365

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, July 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	16	17
10-19	19	16
20-29	6	4
30-39	6	1
40-49	11	3
50-59	2	2
60-69	3	1
70-79	8	1
80-89	1	-
90-99	1	1
100-109	1	-
130-139	-	1
140-149	1	-
150-159	1	-
Total	76	47

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes 5 redocumented vessels in July 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 52 in 1963; 1 in 1962; 1 in 1958; 1 in 1951; 20 prior to 1951; and 1 unknown.
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.

During July 1963, a total of 76 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 33 in July 1962. There were 47 documents cancelled for fishing vessels in July 1963 as compared with 23 in July 1962.

U.S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1963:

United States imports of edible fishery products in 1963, in general, reflect the comeback of the Maine sardine fishery this season by the drop in imports of canned sardines in-oil; the sharp drop in demand for canned tuna in the second quarter of this year by the substantial decline in imports of frozen tuna; and the strong United States demand for shrimp by the higher imports of frozen shrimp.

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in July 1963 were up 14.1 percent in quantity and 17.0 percent in value from the previous month. In July, imports were much higher for groundfish fillets (increase mostly from Canada), fresh swordfish from Canada, and canned tuna in brine from Japan. Imports were also up for halibut and salmon fillets from Canada, canned crab meat from Japan, canned oysters from Japan, frozen frog legs from Japan, and frozen shrimp. The increase was offset partly by a sharp drop in arrivals of frozen tuna, and lower imports of northern lobsters from Canada.

Compared with the same month in 1962, imports in July 1963 were down 7.7 percent in quantity, but about the same in value. This July there was a heavy cutback in imports of frozen tuna. Imports were also down for cod fillets, canned sardines (in-oil and not-in-oil), and canned salmon. But imports were up for fresh swordfish, canned albacore tuna in brine, frozen shrimp, sea scallops, and groundfish fillets (other than cod fillets).

In the first 7 months of 1963, imports were down 5.4 percent in quantity and 2.5 percent in value. Fluctuations in individual import items were much greater than the over-all totals indicate. Imports were down sharply in 1963 for canned tuna in brine, frozen tuna, canned sardines in oil, frozen spiny lobsters, and canned salmon. On the other hand, there was a large increase in imports of canned sardines not-in-oil (mostly from South Africa Republic) and frozen shrimp, as well as heavier shipments of ocean perch fillets, blocks and slabs, fresh swordfish from Canada, canned crab meat from Japan, and frozen frog legs from India.

U. S. Imports and Exports of Edible Fishery Products, July 1963 with Comparisons

Item	Quantity				Value			
	July		Jan.-July		July		Jan.-July	
	1963	1962	1963	1962	1963	1962	1963	1962
	(Millions of Lbs.)				(Millions of $)			
Imports:								
Fish & Shellfish:								
Fresh, froz. & processed 1/	96.0	104.0	627.5	663.7	35.1	35.0	220.5	226.1
Exports:								
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen	1.8	2.1	18.4	19.5	1.0	1.0	7.6	7.9

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

Exports of processed fish and shellfish from the United States in July 1963 were down 10.0 percent from those in the previous month, but the value of the exports was the same in both months. The decline in quantity affected all the leading canned fish items exported by the United States except the higher-priced canned shrimp which showed a considerable gain in July.

Compared with the same month in 1962, the exports in July 1963 were down 14.3 percent in quantity, although the value of the exports was again the same in both months. A sharp drop in exports of canned sardines (not in oil) and canned mackerel this July was offset by larger shipments of canned shrimp and canned squid.

Processed fish and shellfish exports in the first 7 months of 1963 were down 5.6 percent in quantity and the value dropped 3.8 percent from the same period in 1962. The drop in value was due to a general decline in the price of canned fishery products in 1963. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of canned salmon and canned squid and in particular canned shrimp which increased 48.6 percent from the same period in 1962. Although not covered in the table, exports of frozen shrimp were up sharply in the first 7 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

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IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, JULY 1963:

United States imports of fish meal and scrap in July 1963 totaled 43,223 short tons, a gain of 134.2 percent from the 18,452 tons imported in the previous month, and an increase of 67.2 percent from the 25,857 tons imported in July 1962.

About 77.2 percent of the fish meal and scrap imports in July 1963 entered through the Customs Districts of Georgia, Mobile

U. S. Imports of Fish Meal and Scrap by Customs Districts, July 1963

Customs Districts	July 1963
	Short Tons
Maine and New Hampshire	352
New York (N. Y.)	1,102
Philadelphia (Pa.)	100
Maryland	661
North Carolina	772
Georgia	4,964
Mobile (Ala.)	4,961
New Orleans (La.)	1/1,488
Sabine (Tex.)	557
Galveston (Tex.)	2,579
Los Angeles (Calif.)	2/4,295
San Francisco (Calif.)	6,013
Washington	4,892
Hawaii	8,262
Dakota	257
Duluth (Minn.) and Superior (Wis.)	1,538
Michigan	188
Other Customs Districts	3/ 242
Total	43,223

1/Includes 1,488 tons of fish meal classified as fertilizer.
2/Includes 833 tons of fish meal classified as fertilizer.
3/Includes 30 tons of fish meal classified as fertilizer.

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free of charge by writing to the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20233.

(Ala.), Los Angeles (Calif.), San Francisco (Calif.), Washington, and Hawaii.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, AUGUST 1963:

Wholesale price trends moved downward in August 1963 for the third month in a row starting in June in accordance with the usual seasonal trend. The 4.1-percent drop from July to August was due largely to lower prices for processed fresh and frozen fish and shellfish, and somewhat lower prices for canned fish products. Prices this August were generally lower than those in July in all of the subgroups except those under drawn, dressed, or whole finfish which were substantially higher. Compared with a year earlier, the index this August at 105.5 was down 13.2 percent. Supplies of a number of the major fishery products were more plentiful this August than a year earlier with fresh and frozen shrimp in the forefront, followed by several of the canned fish items.

At New York City, lighter August supplies of fresh dressed western halibut and king salmon resulted in higher prices for those products. Because of those higher prices (halibut up 7.0 percent and salmon up 5.6 percent), the subgroup index for drawn, dressed, or whole finfish jumped 5.5 percent from July to August. Prices this August also were higher for ex-vessel large haddock at Boston (up 1.4 percent) and Great Lakes fresh-water fish at Chicago and New York. But compared with the same month a year earlier, a more plentiful supply of most products caused the subgroup index this August to drop 11.9 percent. Prices for all items in the subgroup were sharply lower than in August 1962 except Great Lakes whitefish and yellow pike which were up 25.6 and 28.0 percent, respectively.

As in the previous month, there again was a sharp drop from July to August in fresh shrimp prices at New York City (down 23.2 percent) because of better supplies from the South Atlantic States. These lower prices contributed significantly to the 13.5-percent drop during the same period in the subgroup index for processed fresh fish and shellfish. Prices this August also were lower for shucked standard oysters at Norfolk (down 5.9 percent) and fresh haddock fillets at Boston (down 2.6 percent). As compared with the same month in 1962, the subgroup index this August was down 11.1 percent chiefly because of lower prices for fresh shrimp. A year earlier, shrimp supplies were very light and wholesale prices were about 40 percent higher than this August.

The lower price index for processed frozen fish and shellfish (down 8.3 percent) from July to August also was influenced principally by sharply lower shrimp prices. At Chicago, frozen shrimp prices dropped 15.1 percent (from 93 to 79 cents a pound). Compared with the same month a year earlier, frozen shrimp prices this August were 27.3 percent lower because of more liberal supplies. From July to August there was a slight decline in prices for frozen flounder fillets (down 1.2 percent), but small haddock fillets were up

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Aug. 1963	July 1963	Aug. 1963	July 1963	June 1963	Aug. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					105.5	110.0	114.4	121.6
Fresh & Frozen Fishery Products:					108.0	114.3	120.5	124.3
Drawn, Dressed, or Whole Finfish:					116.0	110.0	109.7	131.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.11	84.6	83.4	97.9	109.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.39	.36	113.8	106.4	106.4	138.9
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.93	.88	129.2	122.3	118.8	146.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.66	.59	98.5	88.0	84.3	78.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.64	.62	104.8	100.7	76.2	81.9
Processed, Fresh (Fish & Shellfish):					104.5	120.8	135.1	117.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.38	.39	91.1	93.5	100.8	89.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.70	.91	82.0	106.7	133.0	114.3
Oysters, shucked, standards	Norfolk	gal.	8.00	8.50	134.9	143.3	143.3	126.5
Processed, Frozen (Fish & Shellfish):					98.9	107.9	113.1	117.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	98.9	100.1	100.1	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.36	.35	105.5	102.6	102.6	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.33	115.7	116.6	117.5	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.79	.93	93.1	109.7	118.6	128.1
Canned Fishery Products:					101.6	102.8	104.1	117.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.00	24.00	104.6	104.6	104.6	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.88	11.15	96.6	99.0	99.9	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.75	5.90	97.5	2/100.0	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.11	8.11	104.0	104.0	113.0	119.4

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/ One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/ Based on Calif. sardines and not directly comparable with replacement (jack mackerel) for January-August 1963.

2.8 percent. August prices for ocean perch fillets declined only fractionally from those of the previous month, but they were up 10.0 percent from August 1962. The subgroup index this August was 16.0 percent below the same month a year earlier principally because of the substantially lower shrimp prices.

Prices for canned Maine sardines and canned pink salmon this August were unchanged from the previous month. The slight drop from July to August in the canned fishery products subgroup (down 1.2 percent) was due to lower prices for canned tuna and canned jack mackerel. The California canned tuna pack as of the end of August 1963 was substantially below that of the same period a year earlier but did not create any supply shortage as the carryover from the 1962 pack was liberal and the demand during the second quarter of 1963 was below normal. Compared with August 1962, prices this August were sharply lower (down 13.5 percent) because of still liberal stocks of all canned fishery products.