TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITIES IN BERING SEA, JUNE 1964:

There was an increase in foreign fishing activity off Alaska during June 1964. By the end of that month, some 400 Soviet and Japanese vessels were fishing in the area.

U.S.S.R.: KING CRAB FISHERY: A tangle-net fishery for king crab was the only major Soviet effort in the eastern Bering Sea during June--an area of intense Soviet fisheries during the winter and early spring periods. The factoryships Pavel Chebotnyagin, Konstantin Sukhanov, and Vasiliy Blyukher, each accompanied by at least two tangle-net setting trawlers, were concentrating on the Continental Shelf north of the Alaska Peninsular from Unimak Pass to near Port Heiden. The limited Soviet fishery for shrimp located northwest of the Pribilof Islands during May 1964 had apparently been abandoned.

TRAWL FISHERY: The major Soviet fishery off Alaska had their trawling fleet fishing primarily for Pacific ocean perch in the Gulf of Alaska. That fishery, which began near Yakutat in March, shifted to the west with the major concentration during June centered on Albatross Bank south of Kodiak Island. About 90 trawlers, 15 freezerships, 3 factoryships, and associated support vessels were included in the Albatross fleet. A smaller Soviet trawling fleet of about 25 trawlers and 4 freezerships was operating on Portlock Bank east of Kodiak. Frequent observations of the catches by the Soviet trawling fleet near Kodiak continue to indicate they were taking large quantities of Pacific ocean perch, with very little incidental catches of other species such as halibut and king crab.

WHALING: In mid-June, the massive whale factoryship Sovetskaya Rossiya, accompanied by at least 11 whale killer vessels, was observed actively engaged in whaling off Cape Spencer in southeast Alaska. The Rossiya was built in 1961, is over 700 feet lon of 32,000 gross tons, and carries a helicop aboard. It was believed she was returning from the whaling season in the Antarctic, t ing additional whales en route to her home port of Vladivostok.

Fig. 1 - Soviet trawler operating in North Pacific and Bering S Vessel under way with all nets aboard.

Japan: SHRIMP FISHERY: The Japane factoryship Chichibu Maru, with 12 accom

nying trawlers, which was engaged in a rimp fishery generally north of the Pribilof lands throughout the year was reported to ve returned to Japan for repairs. She is heduled to return to the eastern Bering Sea ring August. A second shrimp factoryship, Einin Maru, also with 12 trawlers, was l in the area generally north of the Prib- s during June.

KING CRAB FISHERY: King crab fishing he Japanese involving the factoryships ei Maru and Tainichi Maru was centered he area off Port Moller during June. Each he factoryships was accompanied by 6 wler-type vessels for handling the tangle s.

LONG-LINE FISHERY: The Japanese long- fishery, specifically for halibut in the stern Bering Sea, apparently was abandoned to disappointing catches. At last report Kotoshiro Maru No. 25 with one accom- nying long-liner shifted its operations to r the Siberian coast. The factoryship Fuji ru No. 3 was reported to have returned to pan. The 5 long-line fishing vessels ac- mpanying the Fuji Maru No. 3 were to be signed to the Seifu Maru fleet.

2 - Cleaning and packing compartment aboard a Japanese toryship.

FISH-MEAL FISHERY: A total of 4 Japa- e fish-meal and oil producing fleets were rating in the eastern Bering Sea during e. The factoryships Hoyo Maru and Gyo- ei Maru, with 30 trawlers assigned to each, re operating on the "flats" of outer Bristol y from Unimak Pass to the area east of the ibilof Islands. The factoryship Tenyo Maru h 28 trawlers was joined by another fish- al and oil fleet of the factoryship Soyo aru, also with 28 trawlers. Throughout st of June those 2 fleets have operated in the general vicinity of Unimak Pass on the Bering Sea side. The factoryship Seifu Maru licensed with 28 trawler vessels also appeared near Unimak Pass in late May. Officials aboard the Seifu told members of a United States boarding party that their catches had been poor and that they were moving to the Siberian coast. The shift to other waters apparently had been made as the Seifu fleet was not sighted in the eastern Bering Sea during June.

WHALING: Whaling operations were conducted by 3 Japanese fleets near Alaska during June. The factoryship Kyokuyo Maru was believed to be operating near Amchitka Pass in the mid-Aleutians with another fleet, possibly the Nitto Maru, further eastward near Amukta Pass, west of Umnak Island. A whale killer, which in 1963 was assigned to the Kinjo Maru fleet, was sighted several times during June off southeast Alaska in the region generally west of Baranof Island.

EXPLORATORY FISHING: The Japanese trawlers Taiyo Maru No. 81 and Tenryu Maru "exploratory" fishing in the Gulf of Alaska during the month were joined by 2 others, the factory stern trawler Akebono Maru No. 51 and the smaller side trawler Kohoku Maru No. 2. Those 4 of 6 such vessels to engage in Gulf of Alaska "exploratory" fishing were concentrated in the area east of the Trinity Islands, southwest of Kodiak. The factory trawlers Akebono No. 51 and Taiyo No. 81 were reported seeking Pacific ocean perch primarily, while the side trawlers Tenryu and Kohoku No. 2 were mainly looking for shrimp.

* * * * *

KODIAK FIRM PROCESSES DUNGENESS CRAB:

It was reported that a cold-storage plant in Kodiak would employ from 40 to 50 women to help process Dungeness crab at that plant. During June, 12 women were working at the shaking tables. The firm has been shipping large quantities of fresh cooked Dungeness crab meat to other states where the supply is limited.

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SOUTHEASTERN ALASKA SALMON PURSE-SEINE SEASON OPENED JULY 1:

The Alaska Department of Fish and Game announced in June that Districts 4, 12, and 14 were to be open for purse seining on July 1

for two days' fishing beginning at 6:00 a. m., July 1, and ending at 6:00 p. m., July 2. Test fishing had indicated that southeastern Alaska may have one of the best chum salmon seasons in recent years. Chum were the dominant species in almost all of the test fishing areas from Ketchikan to Icy Strait.

* * * * *

HALIBUT PRICES RISE IN JUNE:

Halibut ex-vessel prices continued to rise in June at Ketchikan. Late ex-vessel sales were as high as 24.5 cents a pound for medium and large fish, and 12 cents for chicken halibut.

* * * * *

PINK SALMON OFF SOUTHEAST ALASKA COAST:

High-seas fishing and tagging by Canadian and United States vessels indicated that a large concentration of pink salmon were lying off the coast of southeastern Alaska on June 10. Whether those fish were bound for southeastern Alaska or points farther south was not known at the time.

* * * * *

BUTTER CLAM DIGGING FEASIBLE DESPITE EARTHQUAKE:

A 2-week survey of the effect of the March 27 earthquake on shellfish resources showed in part that in spite of the beds subsiding 4 feet and a substantial reduction of exposed clam beach, commercial digging for butter clams was still feasible in Kasitsna Bay. Indications were that there was little harmful effects generally upon king crab, Dungeness crab, or shrimp. Although some crab pots for both species were lost because of siltation, razor clam beds on the Kenai Peninsula and the Alaska Peninsula did not seem to be severely damaged. The amount of loss of razor clam beaches on the Copper River flats caused by a 6-foot rise in land elevation had not yet been accurately determined, but it was not expected to be of major proportions.

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DUNGENESS CRAB REPORTED PLENTIFUL OFF CAPE FAIRWEATHER:

A fishery firm in Douglas sent 5 vessels to the Cape Fairweather area during June. Heavy catches of large Dungeness crab were taken throughout the month. It was reported that by the end of the month, 200,000 pound of "prime" crab had been produced from th area. One vessel reportedly landed over 50,000 pounds.

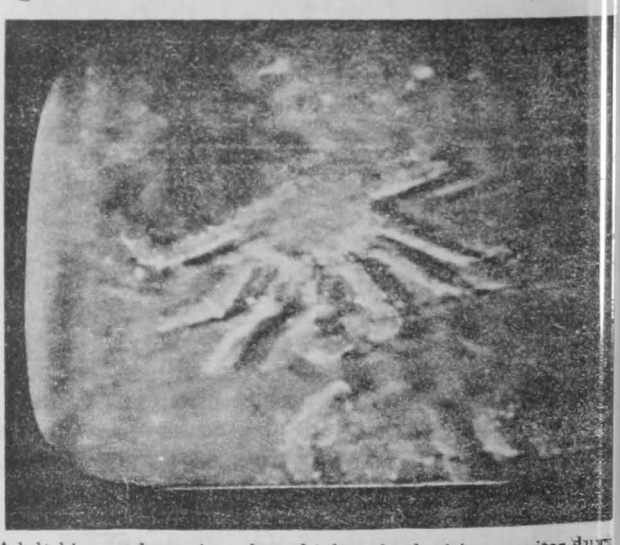
Alaska Exploratory Fishery Progr

UNDERWATER TELEVISION USED FOR LOCATING KING CRAB:

M/V "Paragon" Cruise 64-1 (May 25-J 15, 1964): Underwater television (UTV) e ment was tested as a method for locating c centrations of king crab off Kodiak Island, laska, during this cruise by the U. S. Bure of Commercial Fisheries chartered explo tory fishing vessel Paragon. Specialized e quipment included a compact (18-inch by 3 inch diameter) UTV camera and 1,000-watt mercury vapor light mounted within a prote tive frame, 500-feet of cable, and a 17-inch monitor from which 16 millimeter movies and still photos were taken.

To make observations, the UTV camera light, and cable were suspended from a tra wire and the vessel was allowed to drift. T apparatus was lowered to within 3 to 6 feet the bottom at most stations. When visibilit through the water was good, the camera co be raised to obtain an increased field of vi At 6 feet, an area about 3 feet by 4 feet wa included in the field of view.

The length of time spent at each station was determined by weather conditions, con figuration of the bottom, water clarity, and



Adult king crab as viewed on shipboard television monitor dur M/V Paragon Cruise 64-1 (May 25-June 15, 1964).

ber of crabs seen. At some locations, 3 hours were spent viewing the bottom. ough the speed of drift varied because of and wind conditions, distances up to one were surveyed between the starting and ng points of individual stations.

variety of stations were observed with m types ranging from mud to large boul- in depths from 4 to 60 fathoms. During stigations at 44 individual locations ad- t to Afognak, Raspberry, and Kodiak Is- , significant quantities of king crab were ved at only 2 stations. On June 4, in berry Straits, numerous king crab were ved at depths of 8 to 10 fathoms. An es- ted concentration of 50 adult crabs was on the screen at one time. Off Uganik , Kodiak Island, a concentration of adult crab was observed in 18 fathoms. One p of at least 50 closely-packed individu- was seen as were lesser aggregations. stimated total of 200 king crab was seen at station.

t least one crab was seen at most of the r stations and as many as 30 to 40 scat- d crabs were viewed at a station in the k Bay area.

Dungeness crab, shrimp, cod, flatfish and r marine life were observed frequently ng the experiments. Plankton and sus- ed matter in the water limited the effec- field of view. Conditions during other ons with plankton less abundant would nce the potential of underwater television rospecting for crabs. Bottom resources de areas of the continental shelf off A- are only poorly known. The demon- ed ability of UTV for locating king crab, mp, and other marine life indicates its ible application in future exploratory eys.

ska Fisheries Exploration

Gear Research

LLFISH EXPLORATIONS STARTED BY EARCH VESSEL "PARAGON":

On June 16, the U. S. Bureau of Commer- Fisheries chartered exploratory fishing el Paragon started shellfish explora- s from Kodiak westward. As a warm-up, haul of 1,200 pounds of 16-21 count (heads-on) sidestripe shrimp was taken in Marmot Bay, off Kodiak. In addition, a near- by drag with an 8-foot scallop dredge yielded 4 bushels of up to $7\frac{1}{2}$-inch scallops.

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KING CRAB TAGGING:

The king crab fishery began to operate in June in the Kodiak area after a 2-month period of inactivity. The first research charter cruise of the season by the Bureau of Commercial Fisheries started in late May and continued until June 15. Fishing for crab with trawls and conventional crab pots at 11 locations in the Portlock Bank area yielded 3,560 king crab. Over 3,000 of those crabs were tagged and released.

Botulism Research

FEDERAL GOVERNMENT COMMITTEE FORMED TO COORDINATE RESEARCH:

A permanent Federal Government committee, called the Interagency Botulism Research Coordinating Committee (IBRCC), was formed recently as a result of a meeting held in February 1964 of officials of various Federal Government agencies in Washington, D. C. Members of IBRCC are from the Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, Public Health Service, Atomic Energy Commission, and the Food and Drug Administration.

The purpose of the committee is to (1) coordinate exchange of information, (2) coordinate to the degree possible interagency research programs, and (3) to serve as consultants in the field on current and projected Government research programs on Cl. botulinum. Although the scope of interest of the agencies represented are applicable to all food products, priority attention was being given to fishery products. The coordinated reports of this committee will provide an up-to-date review of the botulism research field and its direct application to the fishing industry.

California

COMMERCIAL SHRIMP QUOTA OFF CRESCENT CITY-EUREKA AREA INCREASED:

The shrimp quota in Area A, off the coast of the Crescent City-Eureka area, Calif., was raised to one million pounds at a special meeting of the California Fish and Game Commission in Sacramento July 13, 1964. The quota, which affects landings, was raised from the 500,000-pound limit set June 26 in San Francisco, and was in accordance with a survey of the Area A shrimp grounds made by the Department of Fish and Game and representatives of the commercial shrimp industry.

The survey showed there was about 2.2 million pounds of shrimp in the Area A grounds, which is about 50 miles square. Although the 2.2 million pounds is more than was found during the preceding preseason survey, the Department pointed out that it is only half the shrimp population of last year (1963).

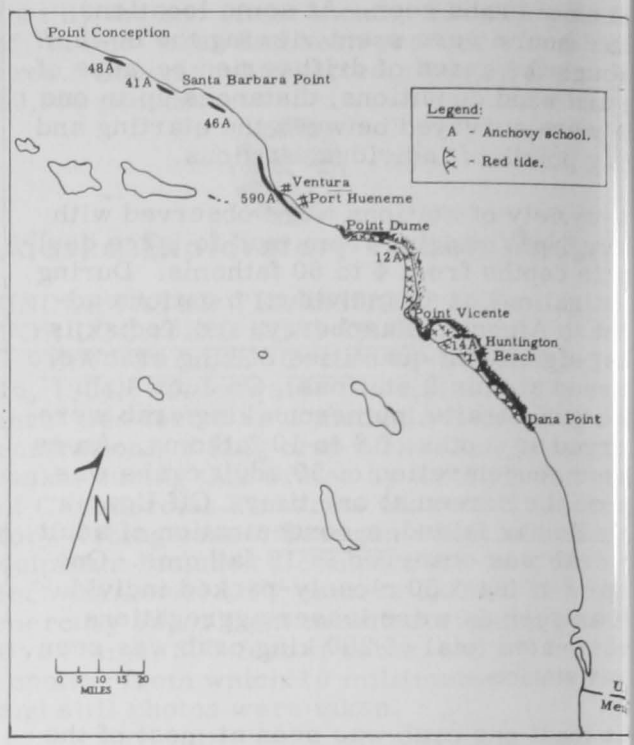
The Commission asked the Department to continue monitoring the shrimp population in Area A and to report the latest findings to the Commission at its August 28, 1964, meeting scheduled in Sacramento. The Commission indicated that should the findings be different from those of the last survey, the quota might be raised or lowered, depending on the evidence presented. (California Department of Fish and Game, July 18, 1964.)

* * * * *

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 64-11-Pelagic Fish (June 15-17, 1964): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Point Conception to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game Cessna "182" N9042T.

On June 15 the area from Point Vicente to Huntington Beach was scouted but visibility was very poor and no fish schools were sighted. The following day, the area from Point Vicente to the United States-Mexican Border was covered. It was observed that "red tide" conditions prevailed along the shoreline from the western Los Angeles-Long Beach harbor area to Dana Point. Only



Pelagic fish survey Flight 64-11, June 15-17, 1964.

10 northern anchovy (Engraulis mordax) schools were sighted.

On the last day of the survey the area from Point Conception to Dana Point was scouted. Large concentrations of anchovies (638 small schools) were sighted between Point Dume and Santa Barbara Point, mainly in the Ventura-Port Hueneme area. From Santa Barbara Point to Point Conception 89 small anchovy schools were seen. "Red tides" prevailed between Dana Point and Point Dume. A total of 26 anchovy schools were sighted in that area.

Note: See Commercial Fisheries Review, June 1964 p. 11.

Cans--Shipments for Fishery Products

January-May 1964: A total of 1,100,953 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-May 1964, a decrease of 8.7 percent from the 1,205,362 base boxes used during the same period in

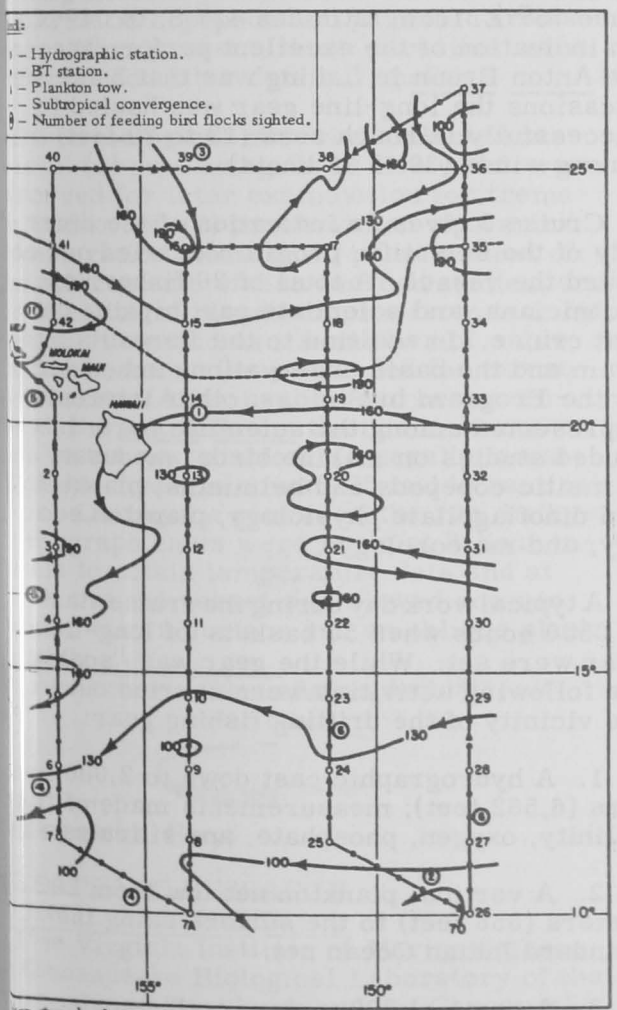
3. The decline was due partially to a drop the canning of jack mackerel and Maine dines.

Statistics cover all commercial and captive plants known e producing metal cans. A "base box" is an area 31,360 are inches, equivalent to 112 sheets 14" x 20" in size. Tonge figures for steel (tinplate) cans are derived by use of the tor 23.5 base boxes per short ton of steel. (In the years 1962 1963, tonnage data were based on the factor 21.8 base boxper short ton of steel.) The use of aluminum cans for packfishery products is small.

tral Pacific Fisheries Investigations

A DE WIND ZONE OCEANOGRAPHIC DIES CONTINUED:

M/V "Townsend Cromwell" Cruise 4 (May June 5, 1964): This was the fourth in a es of oceanographic cruises to determine s of change in the distribution of properin the trade wind zone of the central North Pacific. The research vessel Townsend Cromwell, of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, operated in an area of the Central North Pacific Ocean bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W. during this cruise.



e track chart of M/V Townsend Cromwell Cruise 4 (May 14- 5, 1964) showing contours of 20° isotherm depth.

A total of 43 oceanographic stations were occupied along the cruise track (chart) during this cruise. At each station temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters.

Bathythermograms (BT) were obtained at 30-mile intervals along the cruise track. Between stations 19 and 21, 26 and 28, 35 and 37, BT casts were made at 10-mile intervals. The BT data were coded and transmitted four times daily to Fleet Numerical Weather Facility, Monterey, Calif. Surface bucket temperatures and water samples for salinity analysis were obtained at each BT observation.

At station 33, subsurface currents were measured at depths of 10, 25, 50 and 75 meters, using an Ekman meter, while drifting relative to a parachute drogue set at 1,200 meters.

Ten plastic enclosed drift cards were released at 30-mile intervals along the entire cruise track. Drift cards also were released hourly along the track between Kahului and 18°30' N. latitude and between oceanographic station 42 and Honolulu.

Standard marine weather observations were made and transmitted daily at 0000, 0600, 1200 and 1800 GMT.

Colored photographs of cloud formations were taken each day. No solar radiation measurements were taken because the pyrheliometer was inoperative. One-half hour surface plankton tows were made using a 1-meter net at 2000 daily. Flyingfish collected from the vessel's deck were preserved in formalin.

A standard watch for bird flocks and fish schools was kept by vessel personnel during daylight hours. In addition, observers aboard the vessel from the Smithsonian Institution kept their own watch for birds.

Preliminary inspection of the vertical temperature profiles during this cruise indicated that, in general, a relaxation of the current flow and a warming of the surface waters had

been taking place shortly before the beginning of this cruise. The eddies in the area were less pronounced than in the previous cruises and the general westward flow-pattern was weaker and more regular as deduced from geostropic interpretations of the 20° isotherm depths. The warming effect was seen as a gradual northward creeping of surface isotherm and a shallowing of the mixed layer depth. Surface temperatures ranged from 27° C. (80.6° F.) in the southern portion of the cruise area to 22° C. (71.6° F.) in the northeastern portion.

A feature which became more pronounced during this cruise was the rapid southward rise in surface temperature of 0.5° C. (32.9° F.) or more per 30 miles beginning at 15° N. latitude. Coresponding with that temperature rise was the formation of a sharp near-surface thermocline which deepened rapidly and finally merged with the main thermocline. Numerous feeding birds were seen in association with those features.

Note: See Commercial Fisheries Review, August 1964 p. 17.

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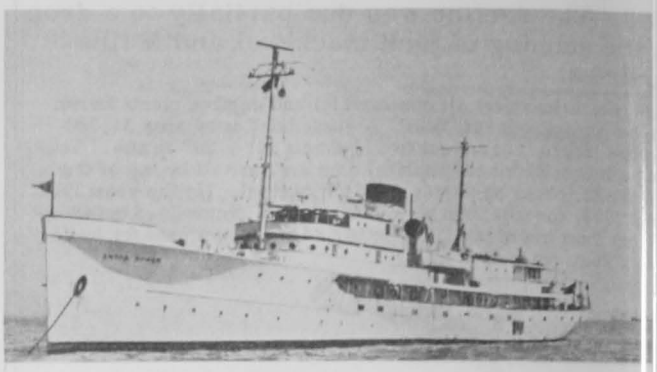
"ANTON BRUUN" PARTICIPATION IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

With the completion of Cruise 5 of the oceanographic research vessel Anton Bruun in June 1964, the U.S. Bureau of Commercial Fisheries Biological Laboratory in Hawaii completed the field aspects of its participation in the International Indian Ocean Expedition. The Laboratory's program was carried out in conjunction with and as part of the United States Program in Biology as coordinated by the Woods Hole Oceanographic Institution.

The Laboratory was responsible for the planning and execution of four cruises of the Anton Bruun that included studies of the demersal fish and invertebrate resources in the Bay of Bengal from March to May 1963 (Cruise 1), and in the Arabian Sea from November to December 1963 (Cruise 4B); and studies of the pelagic fish resources in the central and western Indian Ocean from May to July 1963 (Cruise 2), and from January to May 1964 (Cruise 5).

In the survey of the demersal fish and invertebrate resources of the Bay of Bengal (Cruise 4B), a total of 86 successful hauls was made with the Gulf of Mexico shrimp trawl. On Cruise 2, long-line fishing was carried out at 33 stations which were spaced at intervals along longitude 70° E. between latitudes 18° N. to 37° S. and along longitude 80° E. from latitudes 30° S. to 02° N. On Cruise 5, a total of 38 long-line fishing stations was occupied along longitude 55° E. from latitudes 10° N. to 36° S. and along longitude 75° E. from latitudes 43° S. to 04° N. An indication of the excellent performance of the Anton Bruun in fishing was that on several occasions the long-line gear was hauled in successfully in rough seas (12 to 20 feet) and strong winds (30 to 35 knots).



Oceanographic research vessel Anton Bruun, participating in the International Indian Ocean Expedition, in Bombay Harbor, India

Cruise 5 gives an indication of the diversity of the scientific program carried out on board the vessel. A total of 26 fishermen, technicians, and scientists participated on that cruise. In addition to the Bureau's program and the basic observations scheduled by the Program in Biology, other interests represented among the scientific party included studies on marine birds, medusae, parasitic copepods and helminths, plankton and dinoflagellate physiology, plankton ecology, and meteorology.

A typical work day during the cruise started at 0500 hours when 50 baskets of long-line gear were set. While the gear was "soaking", the following activities were carried out in the vicinity of the drifting fishing gear:

1. A hydrographic cast down to 2,000 meters (6,562 feet); measurements made of the salinity, oxygen, phosphate, and silicates;

2. A vertical plankton net tow from 200 meters (656 feet) to the surface using the standard Indian Ocean net;

3. A vertical 200 meters to the surface micro-plankton net tow for phytoplankton studies

. Water samples from various depths for poses of primary productivity studies and oplankton pigment studies;

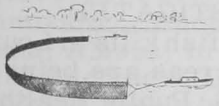
. A multiple plankton net tow using the ets which permit sampling simultaneous- e zooplankton fauna at various depths ing from the surface down to 2,000 me- .

. High-level weather observations made Radiosonde balloons.

he hauling-in of the long-line gear com- ced at about 1300 hours. Depending on size of the catch, hauling took from 2 to urs. Because of the high freeboard of Anton Bruun, the large fish were hoisted oard in a 8 x 4-foot rectangular net. sting of the net was done with a hydraulic m. Each fish when landed was identified length and weight measurements taken. external body surfaces were examined parasitic copepods and parasitic trema- s. When present, those parasites were served for later detailed studies.

Other biological material collected in- ed: (1) guts and gills of fish which were served for later examination for trema- parasites, (2) preservation of ovaries maturation studies, (3) preservation of nach contents of fish for food studies, and collection of blood samples from tuna for population studies. A number of whole imens were also preserved for taxono- studies. After hauling had been com- d, the Anton Bruun then commenced on n to the next station. Generally, an at- pt was made to cover 135 to 140 nautical s. During the course of the run, bathy- mograph casts were made at 3-hour in- als to obtain temperature data and at hours the vessel was slowed down in r to take a surface and an oblique plank- haul.

See Commercial Fisheries Review, April 1963 p. 16.



sapeake Bay

ESAPEAKE RESEARCH UNCIL ORGANIZED:

The Virginia Institute of Marine Science, Chesapeake Biological Laboratory of the versity of Maryland, and the Chesapeake Institute of Johns Hopkins University have organized the Chesapeake Research Council. In discussing the purpose of the Council, the Director of the Virginia Institute of Marine Science said, "This organization of the three primary research institutions concerned with the estuarine waters of Chesapeake Bay and the ocean waters off the coast of Virginia and Maryland will allow for a coordinated approach to common problems. It provides a framework within which we can effectively cooperate in programs concerning all three agencies."

The Chesapeake Research Council will hold its first full meeting in January 1965. At that time staff members of the three research institutions will summarize their present research programs and consider matters of mutual interest. The Chesapeake Biological Laboratory has been conducting research on Maryland's marine resources since 1927, and the Chesapeake Bay Institute has been engaged in studies of marine waters throughout Maryland and Virginia for the past 16 years. The program of the Virginia Instititue of Marine Science was started in 1940.

The three institutions have always worked closely together on common problems in the past. Scientists from the three institutions established the Atlantic Estuarine Research Society in 1949 for the express purpose of exchanging ideas and reporting their research programs. That organization, however, has become so large, embracing members from Maine to Florida, that it seemed wise to create another smaller organization for specific work around Chesapeake Bay. Because of the unified nature of the Chesapeake Bay and the Virginian sea portion of the Atlantic, and because many of the problems in the area are of a long-term nature, scientists have sound reasons for approaching their investigations in a cooperative manner. (Virginia Institute of Marine Science, Gloucester Point, July 21, 1964.)

Clams

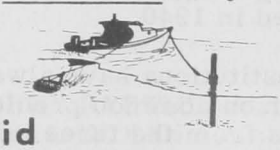
RESEARCH BY UNIVERSITY OF RHODE ISLAND:

Nine bushels of the world's most expensive quahogs (clams), valued at about $1,750, have been placed at the bottom of Narragansett Bay, R.I., with a University of Rhode Island "brand" on them. In the middle of each of the

3,500 quahogs is a red plastic disk with the notation on the perimeter: "Narragansett Marine Lab., Kingston, R.I." The center of the half-inch disk carries the word "Reward" and an identifying number. If returned to the University of Rhode Island with the half of the shell to which they are attached, the disks will be worth 50 cents each.

Thus, the total value of the quahogs is based on the return of each of the 3,500 specimens with a 50-cent reward for each individual return.

The recovered quahogs will help in developing some definite information about harvesting and growth rates of shellfish under varying underwater conditions around Narragansett Bay. An Associate Professor of Oceanography at the University urges the public to return the shell-half with the tag on it, but not to send the entire quahog through the mail. (Source: University of Rhode Island--reprinted from National Oceanographic Data Center Newsletter, May 31, 1964.)



Federal Aid

PACIFIC NORTHWEST STATES RECEIVE FUNDS FOR FISHERIES PROGRAM:

Pacific Northwest States will receive $1,915,000 in Federal aid funds for construction, operation, and maintenance of fishery facilities, stream improvement, and operational studies in 1964/65 fiscal year under the Columbia River Fishery Development Program, the U.S. Bureau of Commercial Fisheries announced July 17, 1964. The States of Washington, Oregon, and Idaho will share the Federal money as part of the program aimed at improving anadromous fish runs of the Columbia River and its tributaries, said the Bureau's Regional Director at Seattle, Wash.

The major portion of the total is an allocation of $989,000 for operation and maintenance of 8 salmon and steelhead hatcheries in Washington and 7 in Oregon which were either built or remodeled with Federal funds but are operated by the states. This allotment includes $412,000 for 6 salmon hatcheries operated by the Washington Department of Fisheries; $145,000 for 2 steelhead hatcheries operated by the Washington Department of Game; $380,000 for 6 salmon hatcheries operated by the Oregon Fish Commission; and $52,000 for the Oregon Game Commission's Gnat Creek steelhead hatchery near Astoria.

Those three States also will receive $48,0 for stream improvement and $98,000 for fis screen maintenance, plus $181,000 for the i work in cooperation with "Operation Fin Cl the Bureau's massive appraisal program which is being conducted over a 10-year p iod to evaluate the contribution of the hatc eries to the fish runs.

A total of $198,000 is allocated for construction, of which $75,000 will be contract to Idaho for 26 fish screens on the Salmon River and its tributaries; $67,000 to Orego for a new pipeline and rearing pond at Big Creek hatchery near Astoria; and $28,000 e to Oregon and Washington for facilities to r move log jams and debris from various streams.

A sum of $300,000 is being earmarked b the Bureau for operational studies by the fis ery agencies of the three States and their r spective universities. Included in that phas of the program are a study on selective bre ing of salmon and steelhead by the Universi of Washington, an investigation by Oregon State University of factors involved in the transition which takes place in young salmo as they move from fresh to salt water, and search by the University of Idaho on develo ment of a toxic material which would elimi trash fish and predators without harming s on. The various State fishery agencies are also planning a number of other research pr jects.

Fish Kills

MORE FISH KILLS IN LOUISIANA INVESTIGATED:

A series of new fish kills in Louisiana's s ar-cane growing areas are being investiga announced the U.S. Public Health Service, partment of Health, Education, and Welfare (HEW) on July 10, 1964. The State of Louis ana water-pollution control agency reporte fish kills in 5 bayous and canals in Souther Louisiana during a single week this past Ju and Public Health Service scientists were a tempting to determine the cause of those ki

State officials had previously requested Public Health Service to give technical sistance in the lower Mississippi to locate, ntify, and abate all sources of pesticide lution. The team investigating the later kills was operating under that agreement. request for technical assistance was de in April 1964 after the Public Health vice and the State of Louisiana announced toxic synthetic organic materials appear- have caused the large fish kills in the r Mississippi River.

A four-State water-pollution enforcement ference called by the Secretary of Health, cation, and Welfare, in New Orleans in found that the pesticide endrin was the se of the massive fish kills during the fall winter of 1963 and that industrial opera- s at Memphis, Tenn., were sources of rin discharge into the Mississippi River.

HEW officials pointed out that the water n the bayous and canals involved in the r Louisiana fish kills does not flow into Mississippi or the Atchafalaya Rivers re the massive fish kills took place last and winter.

The bayous and canals involved were: nd Bayou, Bayou Blach, Theriot Canal, ou Chevreuil, and Company Canal. (Pub- Health Service, U. S. Department of Health, cation, and Welfare, July 10, 1964.)

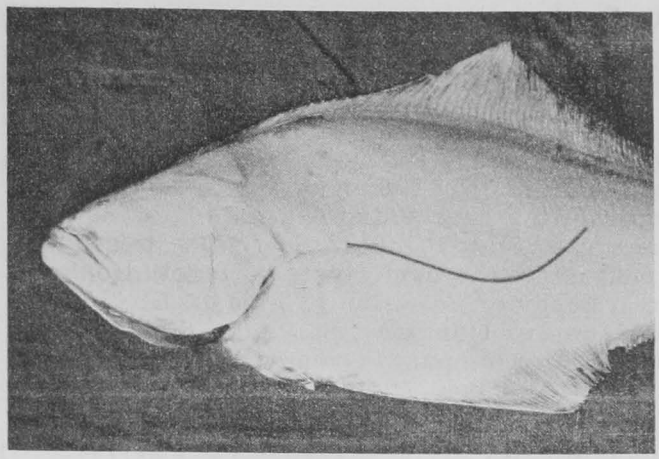
See Commercial Fisheries Review, January 1964 p. 74.

fish

RTH PACIFIC MIGRATIONS HALIBUT AND SOLE:

halibut tagged near Kodiak, Alaska, in 1951 was recovered over 1,400 miles off Tillamook Rock in northern Oregon rs in August 1952, according to the Ore- Fish Commission. Another halibut tag- off Unalaska, Alaska, in May 1959 was vered off the southern Oregon coast in vicinity of Cape Arago in September 1961, r traveling a minimum distance of 2,000 es. That distance indicates an average of movement of about 75 miles a month.

The 2 halibut are among the more than ,000 that have been tagged since investiga- s were begun under the sponsorship of International Pacific Halibut Commission



A dart tag in position on a North Pacific halibut.

in 1925. The movements of halibut and other species have important implications in fisheries management.

Tag recoveries have also indicated extensive migrations by other flatfish. In February 1960, the Oregon Fish Commission released 5,026 tagged petrale sole near Heceta Bank off the central coast of Oregon. Through April 1964, a total of 340 of those fish had been recovered. The fish were recaptured from such widespread spots as southern Vancouver Island (British Columbia), Canada, about 360 miles northward, to Trinidad Head, Calif., approximately 215 miles south of the tagging area. Slightly over half of the recoveries were within 30 miles of the tagging area, while the remainder were spread along 570 miles of the coastline of northern California, Oregon, Washington, and British Columbia.

English sole are also wanderers, according to the Oregon Fish Commission, travelling about the same distances as petrale sole, but with an apparent tendency to move toward northern waters.

Dover sole apparently have a more limited range than English or petrale sole. In April 1955, for example, some 2,406 Dover sole were tagged and released by the Oregon Fish Commission west of Grays Harbor, Wash. Of the 284 recoveries as of mid-1964, only 10 were picked up at distances greater than 30 miles from the point of tagging. The maximum migrations were by 2 fish captured off Vancouver Island, a distance of from 110-140 miles, and 1 off northern California, a distance of about 360 miles. (Source: Notes on Movements of Tagged Sole and Halibut, Oregon Fish Commission.)

Fur Seals

PROCESSING CONTRACT NEGOTIATIONS BY U.S. DEPARTMENT OF THE INTERIOR:

The U.S. Department of the Interior announced July 17, 1964, the start of negotiations late in July 1964 with firms seeking a contract for processing Alaska sealskins for the United States Government. The three firms invited to participate in negotiations are: Superior Seal, Inc., Chicago, Ill., Pierre Laclede Fur Company, St. Louis, Mo., and Fouke Fur Company, Greenville, S.C.

Each of the companies has been required to submit with its proposal to the Government, samples of processed furs for use in a three-phase evaluation program: (1) evaluation of the sealskins by a panel of experts from various Federal agencies, (2) physical and chemical tests conducted by the National Bureau of Standards, and (3) a marketability study based on garments manufactured from the sample sealskins.

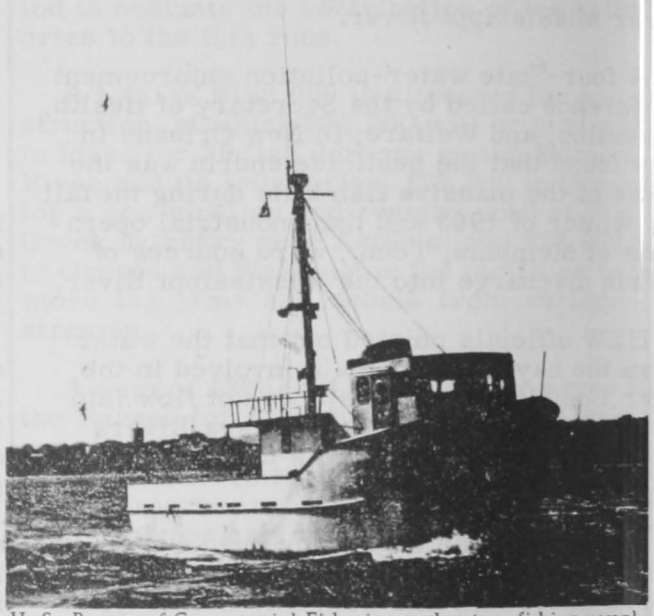
Each year the U.S. Bureau of Commercial Fisheries harvests some 80,000 fur seals on the Pribilof Islands in Alaska. The surplus animals are taken from a herd of about 1,500,000 animals which is managed under the terms of an international agreement with Canada, Japan, and the U.S.S.R. The agreement provides that Canada and Japan shall each receive 15 percent of the sealskins harvested on the Pribilof Islands.

Following curing of the sealskins on the Pribilofs by the Government, the skins are shipped to a processor who dresses and dyes them under contract. The furs are then sold at semiannual auctions for the account of the United States Government. At the last auction held in April 1964, the 2 types of furs into which Alaska seal are processed brought average prices of $90.60 and $48.82 per skin.

Great Lakes Fisheries Exploration and Gear Research

SCHEDULE OF FISHERY EXPLORATIONS IN LAKE SUPERIOR:

The Lake Superior fisheries exploration and gear research program of the U.S. Bureau of Commercial Fisheries for Fiscal Year 1965 will include basic seasonal fishing surveys timed to significant production periods. This is one phase of the "Technical Assistance Project for Providing Assistance and Other Services to the Commercial Fisheries Sector of the Lake Superior Economy." This is an Area Redevelopment Administration Project and that agency provided funds to the U.S. Bureau of Commercial Fisheries for an 18-month study involving technology, economics, marketing, and exploratory fishing.



U.S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho.

Lake Superior operations of the Bureau's exploratory fishing vessel Kaho, based at Saugatuck, Mich., will be confined for the most part east of Keweenaw Peninsula in Lake Superior and will consist of surveys to be made during three critical production periods in the Lake Superior commercial fishery. The surveys will be confined to a limited area so as to assure thorough enough coverage to permit an accurate evaluation of methods used.

Cruise 18 by the Kaho (May 25-June 10, 1964) was made during the time of year when the inshore smelt-spawning-run fishery had just about finished and prices for chubs and lake herring (cisco) were declining while chub production in the lower lakes increased. The objectives of that cruise were:

1. Assessing area bottom conditions for suitability to otter (bottom) trawling.

2. Determining vertical and horizontal distribution of fish concentrations as shown on depth sounder recordings.

3. Determining practicability of using ot- trawls for economical production of smelt, ubs, and lake herring during that period.

4. Testing midwater trawl for capturing dwater concentrations of fish if located.

M/V Kaho cruise scheduled for August 4- 1964: At this time of year smelt report- interfere with gill-net fisheries at 15- om depths off the east shore of Keweenaw insula which may indicate smelt are avail- e to otter trawls in significant quantities. jectives of this cruise will include:

1. Determining midsummer availability of elt, chubs, and lake herring to trawls.

2. Following through on leads in areas t of Keweenaw Peninsula if time is avail- e.

M/V Kaho cruise scheduled for November 5, 1964: At this time of year heavy pro- tion of lake herring with traditional gear experienced. However, glut conditions soon elop and human food markets are quickly mped. Although animal food markets will ept lake herring, traditional fishing gear not produce them profitably because of the ited landed value of animal food fish. Ob- tives of this fishing survey will include:

1. Attempting to improve quality of lake ring produced during spawning season by hing with trawls or seines and utilizing roved holding systems--in cooperation technological assistance.

2. Determining the practicability of uti- g otter trawls, midwater trawls, or lam- seines for economical production of lake ring for animal food markets.

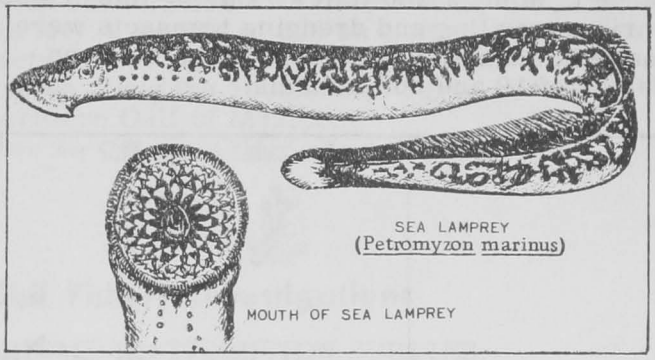
ruise reports on these surveys by the eau's exploratory fishing vessel Kaho be published on completion of each.

See Commercial Fisheries Review, August 1964 p. 23.

eat Lakes Fishery Investigations

LAMPREY CONTROL OF JUNE 1964:

The sea lamprey 1964 catch at Great Lakes essment barriers continued at a somewhat er level than in the previous 2 years. The take of spawning-run lampreys was 10,664 by June 26, 1964, compared to 9,948 in 1963 and 8,276 in 1962. The Brule River, Douglas County, Wis., contributed 58 percent of the total sea lampreys this season compared to 32 percent last year. The index barriers operated on 3 Green Bay streams have captured a total of 4,569 compared to 7,425 a year earlier. The index barrier in Pere Marquette River was shut down on June 14. The total number of sea lampreys was 678 for the season. The Ocqueoc River barrier on Lake Huron captured 2,671 lampreys compared to 4,673 in 1963.



The successful treatment of the Big Manistee River, Manistee County, Mich., added the largest river yet to the growing list of streams to be treated in the United States. The stream discharge was 1,844 cubic feet per second (c.f.s.) and it required 31,392 pounds of lampricide (TFM) to complete the treatment. During the latter part of June the Ford River system, which drains into Green Bay, was treated. Sea lamprey ammocetes were distributed 90 miles upstream. However, flows in the main stream and tributaries were sufficiently satisfactory to complete the treatment successfully. Chemical treatment of Cedar River, Menominee County, Mich., had to be stopped after 4 days of treating in the headwaters when low-water discharge and high storage capacity of the main river pools prevented maintenance of lethal concentrations of TFM between access points to the river. It will be necessary to treat the main river between 100 and 200 c.f.s. of stream flow.

Note: See Commercial Fisheries Review, February 1964 p. 62; October 1963 p. 23; July 1963 p. 38.

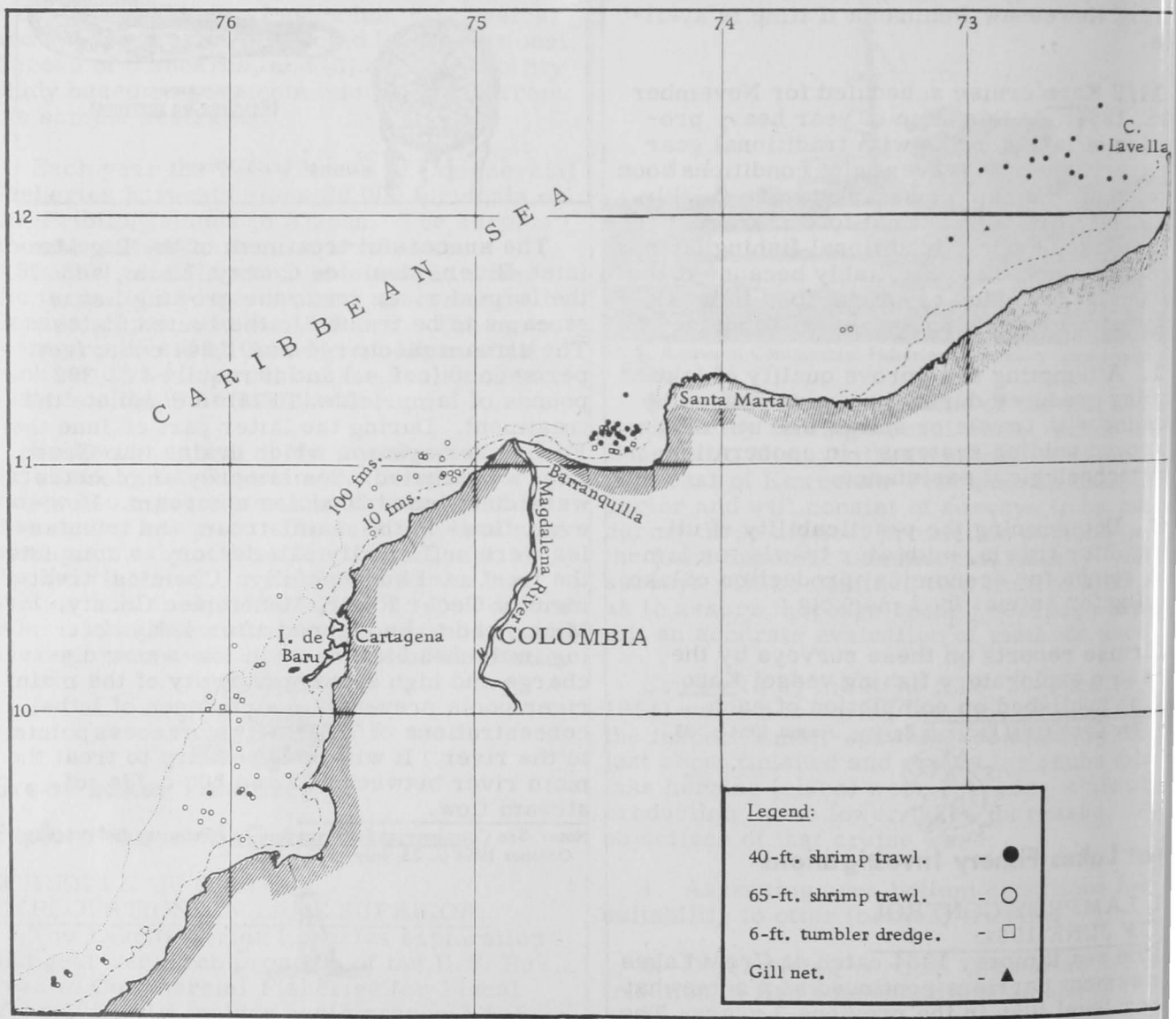
Gulf Exploratory Fishery Program

TRAWLING SURVEY OFF THE CARIBBEAN COAST OF COLOMBIA:

M/V "Oregon" Cruise 92 (May 4-June 17, 1964): An exploratory trawling survey off the Caribbean coast of Colombia was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. This cruise completes the Bureau's preliminary survey of the outer Continental Shelf and Slope zones of the Central Western Atlantic mainland between Cape Hatteras, N. C., and Fortaleza, Brazil--a linear distance of some 7,200 miles. During this cruise shrimp trawling and dredging transects were made in all major trawlable areas between depths of 10 and 500 fathoms.

The survey gear used was 40- and 65-fo flat shrimp trawls fished on 6- and 8-foo trawl doors, and 5- and 6-foot tumbler dredg Trolling lines were out during all daytime running, and monofilament gill-net sets we made on surface indications of Spanish ma erel and tuna.

Shrimp and other Crustaceans: Potenti fishing grounds for brown-grooved shrimp (Penaeus aztecus) were located in the area between Pta. San Bernardo and the Gulf of Darien. An estimated 700 square miles of good trawling bottom was found in depths o 10 to 40 fathoms and nighttime dragging yie ed varying catches of that species on all d Working time in that area was limited, but two nights of double-rig trawling using a 4



Areas investigated during Cruise 92 of the M/V Oregon (May 4-June 17, 1964).

and 65-foot trawl simultaneously produced about 540 pounds of heads-on brown shrimp with a few scattered Brazilian shrimp (braziliensis) mixed in the shallower ones. The 65-foot trawl yielded 350 pounds compared with 190 pounds for the 40-foot trawl. The shrimp were of mixed sizes, ranging from a heads-off count of 20 to 60 pound, and they averaged 36-40 count.

oyal-red shrimp (Hymenopenaeus robus-) were found in light concentrations be- 220 and 240 fathoms south of Santa a. A single catch of 50 pounds of royal- off Cape la Vela indicated a potential fish- round in that area, but extremely ad- sea conditions precluded further deep- work in the region. The shrimp size unusually large with the heads-off count ging about 22 shrimp to the pound.

atches of lobsterette (Nephrops bing-) during the cruise of about 15 pounds our with the 40-foot trawl were made in 70-190 fathom depth range.

napper: Unusually large numbers of sev- species of snapper were taken in the np trawling operation in depths less than thoms. Several commercially valuable es were observed--principally Lutjanus fordi and L. vivanus. Those observa- indicated good fish trawling possibilities nappers but no fish trawls were used on cruise.

una and Mackerel: Heavy seas and strong were encountered during most of the e and sea surface conditions were poor- ited to surface sightings. During the off Colombia, only one day of ideal er conditions was encountered. During ork in the area between Cape Aguja and la Vela, numerous schools of very small in tuna (estimated $\frac{1}{2}$- to 2-pound size) observed. A one-hour set with a 1,500- by 60-foot deep) 6-inch mesh monofila- gill net yielded nothing. All of the fish ved were obviously too small for that size. A single 4-pound blackfin was trolling. Several broadbill swordfish lue marlin sightings were made in the area.

a route to Pascagoula, one day each was tuna scouting in the St. Andrews Island ucatan Channel areas. A few small ols were observed around St. Andrews, he trolling catch was limited to a single wahoo. No schools were observed in the Yucatan Channel, but 30 blackfin (3 to 18 pounds each), 10 little tuna (Euthynnus alleterattus), and 20 runners (Elagatis bipinnulatus) were caught on trolling lines over a few hours at the south end of Arrowsmith Bank.

On this cruise, an apparently uncharted flat-topped sea mount was discovered about 30 miles east of Cozumel Island. The top leveled smoothly at 150 fathoms covering an area of more than 20 square miles. Extensive sounding transects were made of the area.

In cooperation with the National Geographic Society, a series of 500 on-bottom 35 millimeter color photographs were taken on this cruise along the 100-fathom curve in the northern Gulf of Mexico.

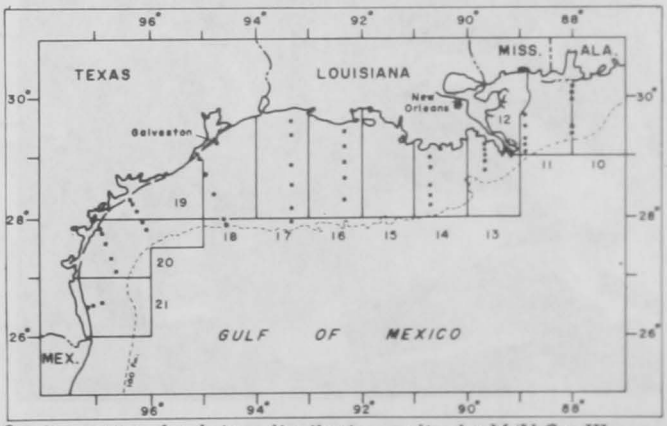
Note: See Commercial Fisheries Review, June 1963 p. 25.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-18 (June 17-28, 1964): Catches of brown shrimp were predominant during this shrimp sampling cruise in the Gulf of Mexico by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Eight statistical areas from off the Louisiana coast extending westward to Texas were covered, and standard 3-hour tows were made with a 45-foot shrimp trawl.

The best catches of large brown shrimp counting 12-15 to the pound were from the over 20-fathom depth of area 16 (46 pounds) and area 18 (14 pounds). Area 18 also yielded



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-18.

18 pounds of 15-20 white shrimp from the under 10-fathom depth, and 68 pounds of small (over 68 count) brown shrimp from 10-20 fathoms.

Area 19 yielded 83 pounds of brown shrimp (51-67 count) from 10-20 fathoms, and from the under 10-fathom range the yield was 16 pounds of 15-20 white shrimp and a small quantity of very small brown shrimp.

A total of 56 pounds of small brown shrimp (51-67 count) was taken from area 20, most of it from 10-20 fathoms, and a smaller quantity of the same size from over 20 fathoms.

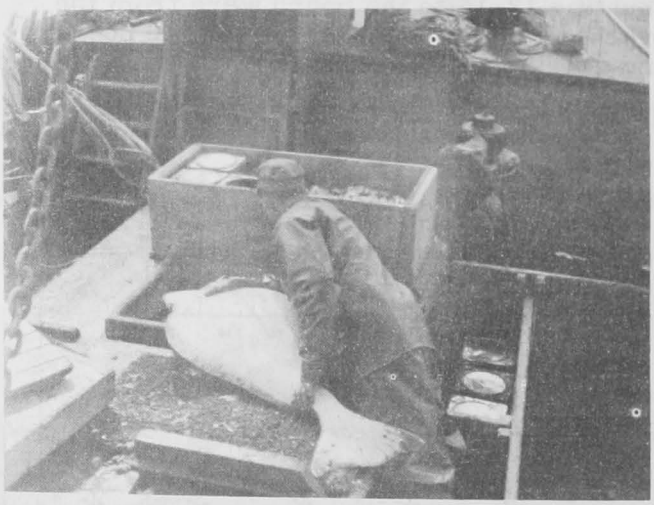
During this cruise, 34 tows with a 45-foot flat trawl were made, 50 plankton tows, 45 bathythermograph, and 41 nansen casts. One of the shrimp trawl tows was made in 150 fathoms, but no shrimp were caught at that depth.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, August 1964 p. 28.

Halibut

NORTH PACIFIC HALIBUT LANDINGS, 1964 SEASON TO JULY 20, 1964:

North Pacific halibut landings by United States and Canadian vessels during the 1964 fishing season to July 20, 1964, inclusive, totaled 13.1 million pounds in Area 2 and 22.2 million pounds in Area 3A, the International Pacific Halibut Commission announced July 21, 1964.



Loading a large halibut in the hold of a fishing vessel in the North Pacific. (Metal cans are used to save the livers.)

In Area 2, the halibut fishing season wil close at the time of the attainment of the ca limit of 25 million pounds or on September 1964, whichever is earlier. (The rate of la ings from Area 2 is expected to be lower di ing the final months of the 1964 season due the diversion of part of the halibut fleet to t fisheries for salmon and sablefish.)

In Area 3A, the halibut fishing season w close at the time of attainment of the catch limit of 34 million pounds or on October 1 1964, whichever is earlier. The closing d of Area 3A will be announced 18 days in a vance.

* * * * *

QUALITY EVALUATION OF EX-VESSEL PACIFIC LANDINGS CONTINUED:

The second phase of an ex-vessel halibu quality evaluation project was started in Sea Wash., and Ketchikan, Alaska, in June 196 the U. S. Bureau of Commercial Fisheries. The quality evaluation project during the 1 North Pacific halibut fishing season is bas on the following dual approach: (1) applica tion of a statistical sampling and quality e uation system for landed halibut; and (2) e perimental study of iced and frozen dresse halibut to relate quality changes to the tim and temperature factors in commercial pr ervation practices. At the end of the 1964 fishing season, the results from both quali studies will be analyzed in economic term with the halibut industry to determine the f sibility of applying a useful grade standard fresh and frozen dressed halibut.

The current quality evaluation study is a tinuation of an investigation begun in 1963. of the conclusions drawn as a result of the 1 halibut studies are: (1) dockside grading significantly influenced by economic, seas and industry factors that may not be related actual quality; and (2) the small price differ tial between dockside grades and the fact th grade 1 is a very broad quality designation does not encourage quality improvement.

Those and other conclusions were discus informally at meetings of halibut vessel o ers, fishermen, buyers, and processors. Buyers and processing firms recognize th the present system does not adequately re flect quality and are interested in a guide that will eliminate prejudice and impro quality at the grading table.

ustrial Fishery Products

MEAL, OIL, AND SOLUBLES:

roduction by Areas, June 1964: Preliminary data on U. S. production of fish meal, and solubles for June 1964 as collected e U. S. Bureau of Commercial Fisheries ubmitted to the International Association sh Meal Manufacturers are shown in the

Production[1/] of Fish Meal, Oil, and Solubles by Areas, June 1964 (Preliminary) with Comparisons

a	Meal	Oil	Solubles	Homogenized[3/]
	Short Tons	1,000 Pounds	....(Short Tons)....	
964:				
Gulf				
ts. ...	38,514	37,588	16,508	-
Coast[2/]	3,023	2,318	1,486	-
al. ...	41,537	39,906	17,994	-
une 1964				
al. ...	81,899	74,574	35,568	-
une 1963				
al. ...	90,156	69,788	36,643	3,841

1/ not include crab meal, shrimp meal, and liver oils.
2/ des American Samoa and Puerto Rico.
3/ des condensed fish.

* * * * *

roduction by Areas, May 1964:

Production[1/] of Fish Meal, Oil, and Solubles by Areas, May 1964 (Preliminary) with Comparisons

a	Meal	Oil	Solubles	Homogenized[3/]
	Short Tons	1,000 Pounds	....(Short Tons)....	
964:				
Gulf				
s. ...	26,450	28,890	11,088	-
Coast[2/]	2,077	232	1,487	-
....	28,527	29,122	12,575	-
May 1964				
....	41,585	34,123	18,413	-
May 1963				
....	55,656	42,158	23,056	2,500

1/ ot include crab meal, shrimp meal, and liver oils.
2/ es American Samoa and Puerto Rico.
3/ es condensed fish.

* * * * *

jor Indicators for U.S. Supply, May

United States production of fish meal

Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, May 1964

d Period	1/1964	1963	1962	1961	1960
	. . . . (Short Tons)				
eal:					
ction:					
	27,304	39,902	40,504	34,446	19,802
ary-Apr. 2/	13,058	16,287	20,161	13,657	16,118
3/	-	253,452	312,259	311,265	290,137

(Table continued on next column.)

Item and Period	1/1964	1963	1962	1961	1960
Imports:			(Short Tons)		
May	59,543	30,399	25,269	25,116	9,496
January-Apr.	162,371	133,083	89,164	63,393	45,701
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 4/:					
Production:					
May	11,736	16,997	16,786	13,629	7,370
January-Apr. 2/	5,838	10,398	9,976	8,799	8,841
Year	-	107,402	124,334	112,241	98,929
Imports:					
May	263	438	265	283	59
January-Apr.	1,539	1,678	3,153	729	2,310
Year	-	6,773	6,308	6,739	3,174
Fish Oils:			(1,000 Lbs.)		
Production:					
May	29,426	33,544	33,436	34,674	16,339
January-Apr. 2/	5,242	7,853	7,262	4,666	4,094
Year	-	185,827	250,075	258,118	209,143
Exports:					
May	9,329	22,150	6,491	3,192	2,427
January-Apr.	46,693	75,401	51,593	43,900	34,764
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.
2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.
3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
4/Includes homogenized fish.

in May 1964 was lower by 31.6 percent as compared with May 1963. Production of fish oil and fish solubles was down also by 12.3 percent and 31.0 percent, respectively.

* * * * *

Major Indicators for U. S. Supply, April 1964: United States production of fish meal in April 1964 was lower by 14.9 percent as compared with April 1963. Production of fish oil was down by 43.3 percent and that of fish solubles decreased 39.5 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, April 1964

Item and Period	1/1964	1963	1962	1961	1960
	. . . . (Short Tons)				
Fish Meal:					
Production:					
April	7,094	8,340	9,359	6,112	6,110
January-March 2/	5,964	7,947	10,802	7,545	10,008
Year 3/	-	253,452	312,259	311,265	290,137
Imports:					
April	55,953	26,607	26,390	19,060	10,397
January-March	106,418	106,476	62,774	44,333	35,304
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 4/:					
Production:					
April	3,045	5,031	4,305	2,965	2,870
January-March 2/	2,793	5,361	5,671	5,834	5,971
Year	-	107,402	124,334	112,241	98,929
Imports:					
April	457	218	323	220	134
January-March	1,082	1,460	2,830	509	2,176
Year	-	6,773	6,308	6,739	3,174
Fish Oils:			(1,000 Lbs.)		
Production:					
April	3,713	6,551	5,645	3,344	2,401
January-March 2/	1,529	1,301	1,617	1,322	1,693
Year	-	185,827	250,075	258,118	209,143

(Table continued on next page.)

Item and Period	1/1964	1963	1962	1961	1960
	(1,000 Lbs.)				
Exports:					
April	22,773	28,480	10,270	7,351	5,711
January-March	23,920	46,921	41,323	36,549	29,053
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.
2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.
3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
4/Includes homogenized fish.

* * * * *

FISH OIL PRODUCERS' VIEWS ON MARKET TRENDS:

A technologist of the U. S. Bureau of Commercial Fisheries Technological Laboratory, Seattle, Wash., made a trip through the Midwest and Atlantic Coast Regions this past summer to collect ideas and suggestions on fish oil research, exchange technical information, and to stimulate old and new interest in fish oil. Among his findings was a new trend in the thinking of fish oil producers in those regions. In spite of fish oil selling at a high price--higher than soybean oil--the fish oil producers were not apathetic about future markets for fish oil. They were aware that the existing high prices were due to the European demand and the disappointing catches in the domestic menhaden fishery.

First among the research interests of both fish oil producers and users who were contacted by the Bureau's technologist was the development of an economical commercial method for production of fatty acids from fish oil. A second interest was the development of a commercial method of fractionation of fish oil fatty acids or esters by separating saturates from unsaturates. Some interest was indicated in isolating individual fatty acids.

* * * * *

RAW MATERIAL SCARCE IN MAINE:

Fish meal producers in Maine reported the demand for fish meal and oil this summer was excellent, but with an almost total lack of supply due to the scarcity in Maine of fish fillet waste, as well as a scarcity of whole fish. Because of the drop in price of fish solubles, one Maine producer has been adding his entire output back to fish scrap.

* * * * *

FISH OILS:

U. S. Trends in Supply, Disposition, and Prices, 1946-1964:
SUMMARY: U. S. total supplies of marine oils have increased from a postwar low of 281 million pounds in 1947 to over 450 million pounds in recent years, mainly due to an uptrend in domestic production. But domestic output dropped sharply in 1963 because of a lower yield from menhaden, the leading source of marine oil produced in the United States.

U.S. marine oil exports have expanded greatly in the postwar era (from 15 million pounds in 1946 to 274 million pounds in 1963). Record U.S. exports in 1963 were attributed to the sharp reduction in world output of marine oils coupled with rising prices. Domestic use, which has fluctuated considerably in the postwar period, fell off sharply in 1963, apparently because of increased prices for menhaden oil.

DOMESTIC PRODUCTION AND USE: U.S. marine oil production in the postwar period has ranged from a low of 124 million pounds in 1952 to a high of 266 million pounds in 1961. During the 1950's, production increased rather steadily. However output in 1963 was cut back to only 186 million pounds.

U.S. domestic disappearance during the postwar period has been irregular, ranging from 185 million pounds in 1947 to a low of 83 million in 1954. Domestic use averaged 159 million pounds in 1960-1962, but in 1963 it dropped to 104 million pounds.

Thirty years ago, when sardine oil was more abundant, marine oils were used domestically in shortening manufacture. Use in nonfood products included paints, varnishes, linoleum and other industrial commodities. Today, use in surface coatings has become a major factor. Substantial amounts are used also in lubricant production, in animal feeds, fatty acids, and miscellaneous industrial purposes.

Manufacturers of exterior house paints use heat-bodied marine oils mixed with raw linseed oil. Those marine oils are used also in aluminum paints (exterior and interior), in barn and roof paints, rustproof coatings, and undercoat paints. In varnish manufacture, bodied fish oil is used in connection with tung oil. That outlet probably has been gaining in importance, since the varnish industry has been taking advantage of the lower cost of fish oil to replace some of the high-priced tung oil in varnish formulations.

FOREIGN TRADE: The United States accounts for around 10 percent of total world production of marine oils and ranks as a major country in world trade in marine oils. Basically U.S. marine oil trade involves exporting menhaden oil and importing the domestically-scarce marine items (mostly whale sperm oil, which is valuable as a lubricant for fine instruments; because it has few economical substitutes, it is stockpiled by the Government as a strategic commodity for defense purposes).

In 1950, the United States reversed a long-term trend by becoming a net exporter of marine oils for the first time. Since then, exports have grown markedly. During 1950-1963 exports averaged 85 million pounds or about 57 percent of domestic production. In 1963, exports totaled almost 275 million pounds, a record. Europe, the leading market, takes around 90 percent of U.S. exports. The Netherlands, West Germany, Norway, Sweden, and Canada have been the major buyers. However, in 1963, exports to the United Kingdom totaled 87 million pounds, the largest for any single country that year. A large part of the menhaden oil used abroad is for margarine, shortening, and other edible products. In those outlets the oils are refined, hydrogenated, and blended with other fats. Hydrogenation removes certain characteristics of marine oils, such as the odor and taste associated with fish oils.

In 1950-1954, U.S. imports of marine oils averaged 72 million pounds or equal to about one-half of U.S. production. Imports in 1963 were 83 million pounds. Japan, Peru, the Netherlands, Norway, and Canada have been the major U.S. suppliers in recent years.

PRICE TRENDS: Fish oil prices (menhaden, crude, tanks f.o.b., Baltimore) have declined sharply since the end of World War II, from an average of 18.6 cents per pound in 1947 to 4.6 cents in 1962. At the lower level, they were one of the lowest-priced oils on the world market. The relatively low price of fish oil in 1962 gave it a comparative advanta

Table 1 - U. S. Supply and Disposition of Marine Oils, 1946-1963

Year	Supply: Stocks Jan. 1	Supply: Production: Menhaden	Supply: Production: Total production 1/	Supply: Imports 2/	Supply: Total	Disposition: Exports & shipments 3/	Disposition: Domestic disappearance
	(Million Pounds)						
4/	5/182	168	186	83	451	274	5/104
	133	233	250	85	468	130	156
	84	243	266	77	427	126	168
	114	189	215	56	385	147	153
	126	160	195	50	371	147	109
	78	132	172	83	333	96	112
	103	122	165	60	328	120	129
	105	174	207	70	382	144	135
	64	164	191	90	345	143	96
	74	144	166	53	293	142	83
	94	138	155	69	317	108	135
	6/98	100	124	81	304	46	165
	7/90	97	140	84	314	51	166
	109	79	166	74	350	77	182
	134	64	136	46	316	40	167
	75	68	131	81	286	20	132
	118	66	128	35	281	21	185
	119	76	153	31	303	15	170

1/ menhaden, tuna and mackerel, herring, fish liver, whale, and seal oils.
2/ fish livers, vitamins, and drugs derived from marine animals.
3/ re-exports, fish livers, vitamins, and drugs. In 1947 and 1948, in- some exports under voluntary relief programs.
4/ ary data.
5/ consumption used for years in which factory consumption exceeds com- mestic disappearance.
6/ Government stockpile.
7/ stocks.

Table 2 - U. S. Domestic Utilization of Marine Oils, 1946-1963

Year	Use in Nonfood Products: Soap	Paint & varnish	Linoleum & oilcloth	Other drying oils	Lubricant & similar oils	Animal feeds	Fatty acids	Other	Total Domestic Utilization
	(Million Pounds)								
	-	16	-	8	27	23	12	18	3/104
	-	68	-	2	25	36	19	7	156
	-	62	2	10	38	27	13	17	168
	-	33	-	15	37	25	2	41	153
	-	3	8	10	25	22	14	27	109
	-	12	-	18	-	-	-	82	112
	2/	11	-	21	-	-	-	97	129
	2/	14	-	18	-	-	-	103	135
	-	13	-	21	-	-	-	62	96
	2/	20	2/	2	-	-	-	60	83
	2/	31	2/	2	-	-	-	102	135
	-	32	1	3	-	-	-	129	165
	-	22	2	5	-	-	-	135	166
	1	21	4	8	-	-	-	140	182
	10	15	4	7	-	-	-	131	167
	35	27	5	8	-	-	-	57	132
	43	34	5	8	-	-	-	95	185
	40	36	5	7	-	-	-	81	170

000 pounds.
ption used for years in which factory consumption exceeds domestic disappearance

of competing drying oils such as soybean, linseed, oils.

roduction of menhaden oil dropped sharply in 1963 hly prices have been moving up rapidly (from per pound in January 1963 to 8.5 cents in April Vorld output of marine oils declined sharply in e primarily to the reduced Antarctic whale catch, at the lowest level since 1960. Production prob- l be higher in 1964 than in 1963 and, if so, prices ecede somewhat.

Table 3 - Wholesale Prices of Menhaden Fish Oil Compared with Prices of Linseed, Soybean, Dehydrated Castor, Tung, and Oiticica Oils, 1961-1964 and Averages for 1956-60, 1951-55, and 1947-50

Year	Menhaden oil, crude, tanks, f.o.b. Baltimore	Linseed oil, raw, tank carlots Minneapolis	Soybean oil, crude, tanks, f.o.b. Decatur	Dehydrated castor oil, tanks, New York	Tung oil, domestic tanks, f.o.b. southern mills	Oiticica oil, liquid, tanks, New York
	(Cents Per Pound)					
1964:						
Jan.	8.1	13.3	8.1	25.1	29.1	32.0
Feb.	8.3	13.3	8.0	25.1	27.9	28.8
Mar.	8.4	13.3	8.1	25.1	26.5	19.0
Apr.	8.5	13.3	7.9	25.1	25.7	18.7
1963	6.2	12.7	8.9	25.1	36.9	28.4
1962	4.6	14.2	9.0	25.1	36.9	16.9
1961	6.2	14.2	11.5	25.0	27.6	14.1
Average:						
1956-60	7.9	13.5	10.7	25.9	22.4	16.8
1951-55	8.8	15.5	13.0	28.5	30.3	20.9
1947-50	13.2	25.2	17.6	26.2	23.8	22.6

OUTLOOK: The U. S. domestic marine oil industry (basically menhaden fish oil) still possesses considerable growth potential. Much depends upon research, both in maintaining a continued high menhaden catch and in better utilization of the oil and its derivatives. Utilization research efforts at present are mainly concerned with long-chained, polyunsaturated fatty acids in such areas as protective coatings, textile chemicals, lubricating oil additives, alkyd resins, plasticizers emulsifiers, aldehydes, and fatty alcohols.

Demand for fish meal probably will outweigh demand for fish oil as a consideration for a profitable fishing operation, although a favorable export market for the oil should exist. Domestic use of fish oil depends greatly upon maintaining a price advantage over that of competing vegetable oils. Finally, "new products" research offers possibilities in such fields as human food products, animal feeds, and other industrial uses. To a large degree, research in increased product utilization may hold the key to the future course of the industry. (Fats and Oils Situation, U. S. Department of Agriculture, May 1964.)

Maine Sardines

CANNED STOCKS, JUNE 1, 1964:

Canners' stocks of Maine sardines on June 1, 1964, were 37,000 cases less than those on hand June 1, 1963, but were 449,000 cases above stocks on hand two years ago on June 1, 1962 (the pack for the 1961 season was exceptionally small). On the other hand, distributors' stocks this June 1 were 39,000 cases more than on the same date in 1963.

On April 15, 1964, carryover stocks at the canners' level amounted to about 622,000 cases as compared with a carryover of 660,000 cases on April 15, 1963, and a carryover of only 33,000 cases on April 15, 1962, which was a short-pack year.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, June 1, 1964, with Comparisons 1/

e	Unit	1963/64 Season: 6/1/64	4/1/64	1/1/64	11/1/63	1962/63 Season: 7/1/63	6/1/63	4/1/63	1/1/63	11/1/62	1961/62 Season: 7/1/62	6/1/62	4/1/62	1/1/62
utors	1,000 actual cases	254	291	261	308	217	215	264	271	230	134	99	148	193
s	1,000 std. cases 2/	499	658	1,063	1,255	643	536	699	1,092	1,348	374	50	45	144

represents marketing season from November 1-October 31.
3-oz. cans equal one standard case.
4 U. S. Bureau of the Census, Canned Food Report, June 1, 1964.

This year's Maine sardine packing season opened on April 15, 1964. Canners were getting ready to start operations as soon as sardines were sighted and landed. Only several hundred cases were reported packed as of early June. By July 11, a total of 211,000 cases (100 No. $\frac{1}{4}$ cans) had been packed, according to the Maine Sardine Council. The pack was much smaller than in the same period in 1963, when 445,000 standard cases were packed. Ample carryover stocks from the 1963 season caused a later start of intense fishing for the 1964 season. As of mid-July, fishing continued spotty with the heaviest sardine catches in the Rockland-Portland area.

* * * * *

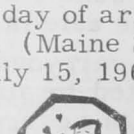
MAINE CANNED SARDINES SERVED AT NATIONAL BOY SCOUT JAMBOREE:

Maine sardines were again served to 50,000 Boy Scouts at their National Jamboree held at Valley Forge, Pa., during the week of July 20, 1964. It was the third consecutive time that they have been featured on the menu of this event which takes place every 4 years.

The cost of the sardines was shared by the Scout organization and the Maine Sardine Council. The Council furnished a specially designed can cover for the occasion.

The Council's Executive Secretary said, "We consider this an outstanding opportunity to sample Maine sardines to one of the largest gatherings of youngsters in the world and are gratified that the National organization again selected our product from the thousands of items available."

The sardines were used as a quick lunch item on both the day of arrival and departure for the campers. (Maine Sardine Council, Augusta, Me., July 15, 1964.)



Marlin

BILLFISH RESEARCH CRUISE BY UNIVERSITY OF MIAMI VESSEL:

To search the tropical Atlantic for the spawning grounds of the blue marlin was the objective of a group of about 10 scientists from the Institute of Marine Science, University of Miami, when they left on the Institute's research vessel John Elliott Pillsbury this past July. The biologists will work in the Gulf Stream and northeast into the Sargasso Sea surrounding Bermuda. Samples of planktonic and other marine life will be taken from the surface down to depths of two miles or more by means of plankton tows, midwater trawls, deep-water trawls, bottom trawls and bottom dredges. Specimens will also be captured by night-lighting (using a submerged light to attract organisms which are dipped out in nets).

The billfish research, part of a long-range study of the distribution, migration, and growth stages of marlin and sailfish, involves a search for eggs, larvae, and juvenile fishes. Stomach contents of various large fish species are examined and other forms of marine life including squid, octopi, flyingfish, and dolphin will be collected for various other Institute of Marine Science projects. The aims of the cruise include the capture of missing size stages of blue marlin, capture of larval white marlin, and the discovery of centers of spawning activity. Investigators of the Institute's Billfish Research Program have already examined over 600 specimens of young marlin ranging to less than a quarter-inch in length. (Institute of Marine Science, University of Miami, July 19, 1964.)

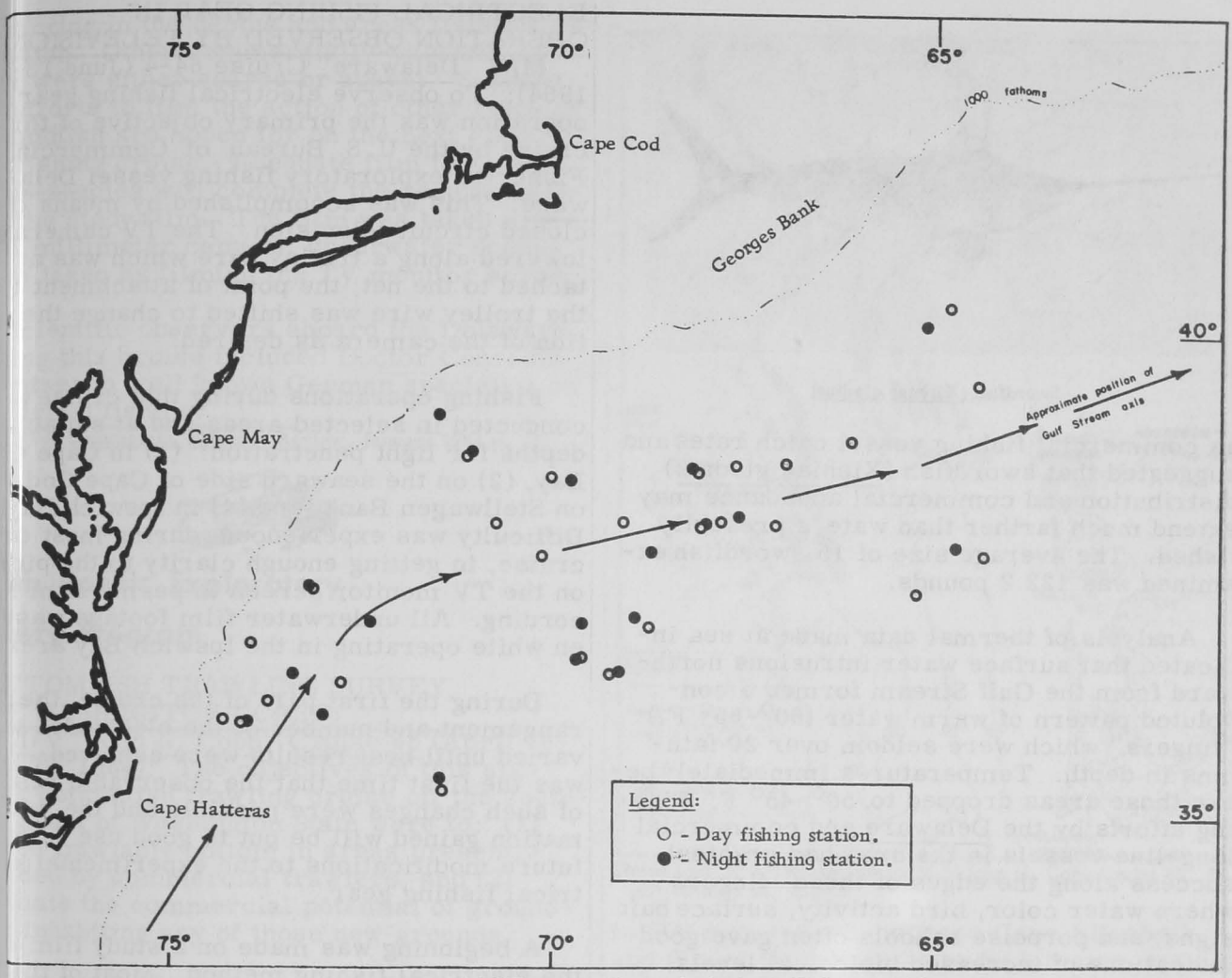
Note: See Commercial Fisheries Review, August 1964 p. 36; August 1963 p. 43.

North Atlantic Fisheries Exploration and Gear Research

TUNA AND SWORDFISH DISTRIBUTION STUDIES IN WESTERN NORTH ATLANTIC:

M/V "Delaware" Cruise 64-3 (April 17-June 4, 1964): The objectives of this cruise were to (1) continue a systematic survey of the seasonal distribution, abundance, and migration of tuna, and (2) investigate the occurrence of both tuna and swordfish in waters contiguous to those in which the annual appearances of those species support commercial fisheries. The exploratory fishing and gear research vessel Delaware of the U. S. Bureau of Commercial Fisheries operated in the western North Atlantic during this seven-week cruise south of New England and east of the Middle Atlantic States.

Night long-line sets were made at 13 stations, and day long-line sets at 26 stations



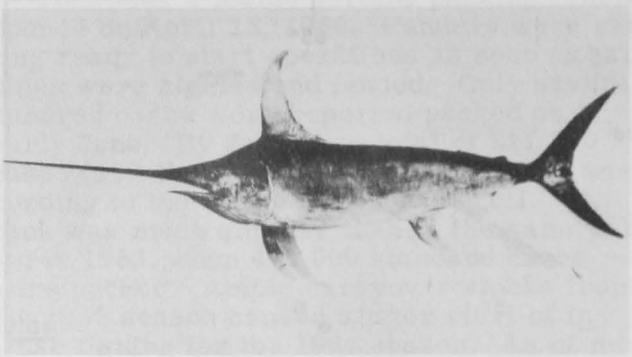
Area of operations during M/V Delaware Cruise 64-3, April 17-June 4, 1964.

ng the cruise. Surface trolling gear was between stations when weather and sea tions permitted. Thermal transects bathythermograph and surface thermo- h data were coordinated with hydrographic rmation from previous investigations to rmine positions of fishing stations.

ellowfin tuna (Thunnus albacares) catch- oth by the Delaware and commercial rdfish long-line vessels in the area, sug- d a commercial abundance of that spe- along the frontal edges of the Gulf am from Cape Hatteras to east of Georges k (65° west longitude). A catch rate of sh per 100 hooks 80 miles northeast of e Hatteras on May 19, 1964, is believed e the highest long-line catch rate for that ies in the western North Atlantic. In- ntal catches by swordfish long-line ves- in the Cape Hatteras area showed simi- high rates. Sightings of small groups of yellowfin tuna "finning out" at the surface were frequently seen and reported, and one 70-pound fish was caught on the vessel's troll gear. The average size of 147 yellowfin tuna examined during the cruise was 74.5 pounds.

Catches of bluefin tuna (Thunnus thynnus) were limited to very small numbers of medium and large fish (160-515 pounds). The few albacore (Thunnus alalunga) caught were also large (33-58 pounds); one 55-pound fish was caught on troll gear in 71° F. water. In addition, 27 big-eyed tuna (Thunnus obesus) (39-200 pounds), and one 14-pound skipjack (Katsuwonus pelamis) were caught on long-line gear.

United States and Canadian swordfish long-line fleets were fishing between the edges of the Continental Shelf and the Gulf Stream during much of the time. Swordfish catch rates during night long-line sets, both north and south of the Gulf Stream, were about the same



Swordfish (Xiphias gladius)

as commercial fishing vessel catch rates and suggested that swordfish (Xiphias gladius) distribution and commercial abundance may extend much farther than waters presently fished. The average size of 15 swordfish examined was 122.2 pounds.

Analysis of thermal data made at sea indicated that surface water intrusions northward from the Gulf Stream formed a convoluted pattern of warm water (60°-65° F.) "fingers" which were seldom over 20 fathoms in depth. Temperatures immediately below those areas dropped to 50°-45° F. Fishing efforts by the Delaware and commercial long-line vessels in the area had greatest success along the edges of those "fingers" where water color, bird activity, surface bait signs, and porpoise schools often gave good indications of increased biological levels.

In cooperation with other agencies, 110 tuna, 4 marlin, and 62 sharks were tagged and released with dart tags. Blood samples of tuna and other species were collected for serological analyses by the subpopulations program at the Bureau's Biological Laboratory in Honolulu. Other data collected and examined included lengths, weights, stomach contents, and sexual condition of all fish taken aboard the vessel. Dip net-night light collections and drift plankton tows were made as time allowed. Other long-line catches of particular scientific note were one specimen of the longbill spearfish (Tetrapturus pfluegeri) and one specimen of the gempylid (Lepidocybium flavo-brunneum).

The Delaware's three-part cruise was broken by port calls at Norfolk, Va., April 29 and May 14, to rebunker the vessel and exchange visiting personnel.

Note: See Commercial Fisheries Review, February 1964 p. 37; August 1963 p. 36; June 1963 p. 38.

* * * * *

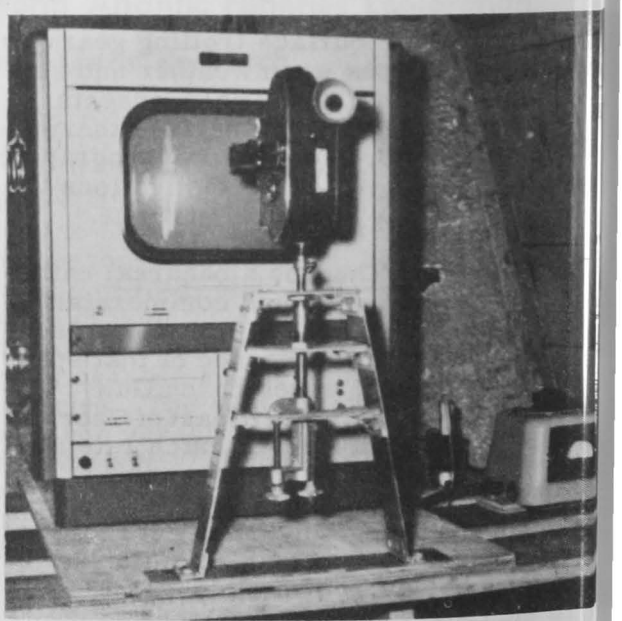
ELECTRICAL FISHING GEAR IN OPERATION OBSERVED BY TELEVISION

M/V "Delaware" Cruise 64-4 (June 18-3 1964): To observe electrical fishing gear i operation was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. This was accomplished by means of closed circuit television. The TV camera lowered along a trolley wire which was attached to the net; the point of attachment f the trolley wire was shifted to change the p tion of the camera as desired.

Fishing operations during this cruise w conducted in selected areas and at suitable depths for light penetration: (1) in Cape C Bay, (2) on the seaward side of Cape Cod, on Stellwagen Bank, and (4) in Ipswich Bay Difficulty was experienced, during most of cruise, in getting enough clarity to the pict on the TV monitor screen to permit film r cording. All underwater film footage was t en while operating in the Ipswich Bay area

During the first part of the cruise, the a rangement and number of the electrodes w varied until best results were achieved. It was the first time that the observable resu of such changes were possible and the info mation gained will be put to good use durin future modifications to the experimental e trical fishing gear.

A beginning was made on a study film o the electrical fishing method. Most of the



TV monitor and camera control unit used on M/V Delaware 64-4. A 16 mm. movie camera is positioned before moni screen to make kinescope recordings.

urring in the depths and areas fished were fish. Other commercially-valuable spe- s were either scarce or absent. Success- efforts to film the action of other types of undfish are hoped for on the next electri- fishing cruise. Adequate film footage of e species will complete the requirements the study film. The film was taken with millimeter camera; underwater scenes e taken by filming the TV monitor screen.

cientific observers aboard the Delaware ng this cruise included Doctor Conradin tzer, a well known German specialist on rical fishing.

See Commercial Fisheries Review, January 1964 p. 21.

th Pacific Exploratory

hery Program

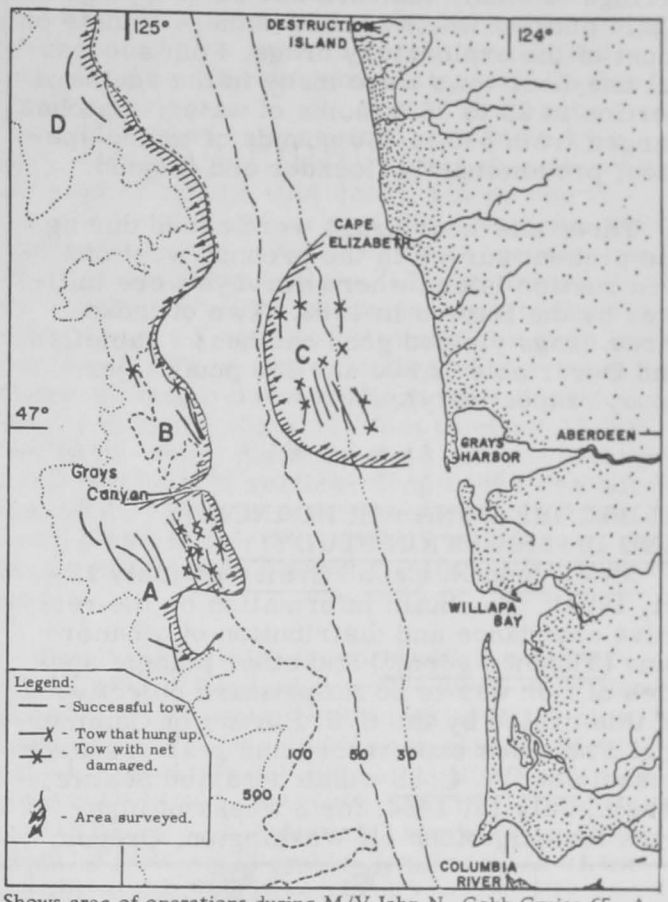
TTOMFISH TRAWLING SURVEY F WASHINGTON COAST:

M/V "John N. Cobb" Cruise 65 (April 16- 28, 1964): The objectives of this six- k bottomfish trawling cruise off the south- coast of Washington State were to: (1) te trawlable bottom in areas presently ded by commercial trawlers, and (2) uate the commercial potential of ground- inhabiting any of those new grounds.

The general region surveyed by the U. S. eau of Commercial Fisheries exploratory gear research vessel John N. Cobb dur- his cruise was along the Washington t from Destruction Island to Willapa Bay. in that region there are two areas that ot extensively fished by commercial trawlers due to the generally uneven or y nature of bottom. One of the areas in- s bottom at depths from 100 to 300 fath- throughout the entire region, and the is located between Cape Elizabeth and s Harbor in 25 to 50 fathoms of water.

oundings were first made over the areas recording echo-sounding equipment to rmine the feasibility of trawling. When and soft bottom were found, test drags made with a snag chain or a net rigged a snag cable.

our areas were surveyed on this cruise: outh of Grays Canyon from 80 to 380 oms, (2) north of Grays Canyon from 80



Shows area of operations during M/V John N. Cobb Cruise 65, April 16-May 28, 1964.

to 200 fathoms, (3) between Cape Elizabeth and Grays Harbor in 25 to 50 fathoms, and (4) west of Destruction Island from 100 to 360 fathoms.

The grounds surveyed south of the Grays Canyon were trawlable in waters deeper than 280 fathoms. Catches were dominated by sablefish which ranged from 364 to 612 pounds of fish per hour of trawling. Between 80 and 280 fathoms, many snags were encountered which resulted in badly torn nets. Two successful one-hour tows were made in 110 fathoms with one of them yielding 3,300 pounds of Pacific ocean perch.

Although the grounds north of Grays Canyon were mostly untrawlable as determined by echo-soundings and exploratory tows, four successful drags were made. The catches from those grounds were small, ranging from 490 to 740 pounds of mixed species (mostly rockfish and flounder) per hour of trawling.

The grounds between Cape Elizabeth and Grays Harbor were found to be flat with scat-

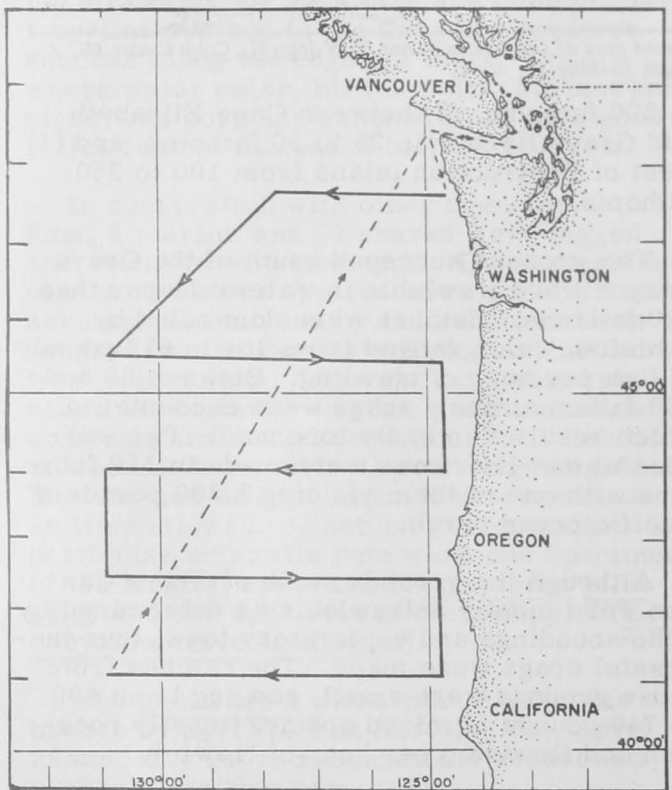
terings of small boulders and outcroppings of shale present which caused damage to nets on most of the exploratory drags. Four successful one-hour tows were made in the southern portion in 25 to 36 fathoms of water. Catches ranged from 530 to 680 pounds of mixed species, predominantly flounder and lingcod.

Three one-hour drags were added during the present survey to the grounds west of Destruction Island where surveys were initiated by the Bureau in 1962. Two of those three drags yielded good catches of sablefish and Dover sole (2,900 and 550 pounds per hour, respectively).

* * * * *

ALBACORE TUNA ABUNDANCE AND DISTRIBUTION STUDY:

M/V "John N. Cobb" Cruise 66 (July 13-31, 1964): To obtain information on the relative abundance and distribution of albacore tuna (Thunnus germo) and other pelagic species of fish was to be the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory and gear research vessel John N. Cobb which departed Seattle, Wash., July 13, 1964, for 3 weeks of high-seas investigations off Washington, Oregon, and California. The explorations were to extend from 40°-48° N. latitude in an area about 30 miles off the coast seaward to 131° W. longitude (see chart for trackline). Oceanographic data, including salinity, oxygen, and chlorophyl determinations were also to be obtained during the survey.



Shows scheduled trackline during Cruise 66 of the research vessel John N. Cobb, July 1964.

Trolling with tuna jigs was to be conducted along the trackline between oceanographic stations. When possible, captured albacore were to be tagged, measured, and released. Albacore unsuitable for tagging were to be prepared for biochemical and microbiological studies. Information on albacore catches were to be broadcast by radio daily to the commercial fishing fleet.

Night-light stations were to be occupied for observations of marine life and forage organisms. In cooperation with personnel from Scripps Institution of Oceanography (La Jolla) standard oceanographic stations were to be occupied daily along the trackline.

Nutrition

FISHERY PRODUCTS REAFFIRMED AS NUTRITIOUS AND HEALTHFUL:

A statement on fats and oils was issued by the American Heart Assocation. It reaffirms that Association's stand on the importance of polyunsaturated fats (such as found in fish) in human foods.

The Association's statement declared that reducing the amount of calories in the diet by decreasing the consumption of saturated fat will not only help prevent obesity but will actually lower blood cholesterol as well. This confirms statements such as those of Dr. Lawrence W. Kinsell, Institute for Metabolic Research, regarding "Fish Fats, Blood Fats and Atherosclerosis:" He said, "Since men are more prone to early development of the complications associated with atherosclerosis, such as heart disease and strokes, it behooves the good housewife, who wishes to help keep her husband's arteries in good condition, to plan new and intriguing ways of preparing fish and to serve seafoods frequently in the weekly diet."

Many factors influence the development of heart disease, and the American Heart Association has emphasized that people should seek medical guidance in making changes in the fat content of their diet. On the other hand, the Association has pointed out, "evidence from many countries suggest a relationship between the amount and type of fat consumed, the amount of cholesterol in the blood and the reported incidence of coronary artery disease."

As Dr. Fedrick Stare, Chairman of the Department of Nutrition, Harvard University, has emphasized, "Fish as compared with most other high-quality protein foods are generally low in fats, and the fat that is present in fish has a generous proportion of the polyunsaturated fats."

Fish and seafoods have always been considered excellent sources of complete and well-balanced protein and minerals - all of which are necessary to health and a feeling of well-

It is becoming increasingly evident that the polyunsat- fats in the foods from our oceans, rivers, and lakes wer blood cholesterol, the number one suspect in the hardening of the arteries responsible for most heart s and strokes.

nography

AN OCEAN INVESTIGATIONS BY EARCH VESSEL "PIONEER":

he world's steepest continental slope has discovered off the east coast of Ceylon e U. S. Coast and Geodetic Survey re- h vessel Pioneer, announced the Depart- of Commerce on July 12, 1964. The scientist aboard the research vessel re- d that the slope where Ceylon drops into the Bay of Bengal is over 45 de- s steep. The average continental slopes between 5 degrees off the west coast of pe, 1 to 15 degrees off the Pacific Coast e United States, and 4 to 7 degrees off merican east coast.

he Pioneer was completing a six-months, 00-mile voyage to the Indian Ocean, sci- ically one of the world's least known ocean s. The vessel, described as a complete- uipped "floating laboratory," left San ncisco, Calif., on February 11, 1964, to cipate in a 20-nation scientific explora- of the Indian Ocean. Scientists from the ppines, Malaysia, India, Indonesia, and ted States scientific agencies were a- d the vessel during the voyage.

e research vessel, which is manned by ficers and crew, was scheduled to reach lulu, Hawaii, about the end of July on its n trip to the United States and San Fran- -Oakland about mid-August. It will then ompleted the longest and farthest trip made by a vessel of the Coast and Geo- Survey in its 157-year history.

addition to discovering the steep con- al slope off Ceylon, other discoveries ctivities of the expedition included (1) nding of several previously unknown un- a mountains; (2) explored for the first two giant submarine canyons off Ceylon of which are larger than the Grand Can- (3) sent SCUBA divers down to search p of another undersea mountain; and (4) housands of color photos of the bottom sea.

The Coast and Geodetic Survey's chief oceanographer, who headed the scientific expedition and flew back to report on its findings, termed the continental slope off Ceylon "truly spectacular." He said, "The west coast of Ceylon is connected with India by a very shallow area. It was known that deep water existed off the east coast, but no one realized how precipitous was the drop from the continental shelf (which begins at the water's edge) to the ocean bottom." He explained that the continental slope is the connecting link between the shelf and the bottom of the sea. He continued, "From about 6 miles off the coast, where we began our soundings, the slope fell from a depth of about 180 feet to about 12,000 feet in the short distance of 18 miles. Nearly 4,000 feet of this vertical drop to the sea bottom off Ceylon was over 45 degrees." "The steep slope is located about 20 miles south of Trincomalee and is about 2 miles long", he said.

The 2 submarine canyons which were explored off the Ceylonese coast were near Batticoloa. The larger, just north of Batticoloa, was 7,800 feet deep and was named Mundeni Canyon for the river closest to it. It was said to be deeper and narrower than the Grand Canyon. The second undersea canyon is located south of Batticoloa and is 2 miles wide at the top and 4,570 feet deep.

According to the oceanographer, one of the most unusual aspects of the trip, was their exploration of an undersea mountain in the South China Sea about 36 to 40 feet below the surface of the ocean. Millions of brightly colored tropical fish swam around them as they made their way over the white coral which covered the top of the mountain. Rock was recovered from the top and sides of the mountain and numerous color photos made of the area with the expedition's underwater cameras.

During the remainder of the expedition, the research vessel Pioneer was slated to explore some of the Pacific's most mysterious phenomena, the huge trenches, such as the Java, Philippines, Marianna, Palau, and Yap Trenches, at the ocean bottom. "They are all much larger than the Grand Canyon," explained the vessel's chief oceanographer. "They are large narrow gashes in the bottom of the sea and their origin is still in the realm of theory. We do not know what caused them. There is nothing like them anywhere on land, so we can only study them at sea. Very possibly they represent areas where the earth's crust has

actually been pulled down by forces acting deep within the earth. We hope the expedition will be able to shed some light on the origin of these tremendous sea-floor trenches."

The great wealth of scientific material collected on the expedition, which included a study of the Indian Ocean's physical, chemical, meteorological, geological, biological, and geophysical aspects, will take scientists years to assimilate completely. A preliminary report of the expedition, is to be made available in early 1965. (U. S. Coast and Geodetic Survey, July 12, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 23.

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UNIVERSITY OF MIAMI RESEARCH VESSEL RETURNS FROM EQUATORIAL ATLANTIC OCEANOGRAPHIC INVESTIGATIONS:

Extensive oceanograph investigations were conducted by the research vessel John Elliott Pillsbury of the Institute of Marine Science (IMS), University of Miami, during the first part of this year. The 176-foot vessel returned to Miami in June 1964, from five months at sea, after covering 18,600 miles during a series of investigations along the equator and along the west coast of Africa.

With a crew of 19 and a scientific complement of 15, the vessel left Miami on February 1, 1964, and sailed through the Bahamas and south to St. Thomas, Virgin Islands, doing radiation studies. From St. Thomas she crossed the Atlantic to Monrovia, Liberia, arriving there on February 28. For the next $2\frac{1}{2}$ months she participated in EQUALANT III, a 10-nation oceanographic survey of the tropical Atlantic. The vessel's work was concerned with one of the major objectives of the survey--an attempt to track the equatorial undercurrent, a little-known current that flows east along the Equator, beneath the westward-flowing equatorial current. The scientists succeeded in tracking the underwater current for a distance of 1,320 miles to an area where the current dissipated itself along the African coast. The existence of the current, which is located about 150 feet below the surface, has been known to oceanographers for several years, but little or nothing has been known of its course, speed, or point of termination.

At the conclusion of the study of ocean currents in April, the Pillsbury took on a new group of IMS scientists at Lagos, Niger A study was made of the Gulf of Guinea, a unique ocean region where a combination o currents produces an area of high primary productivity near a fairly sterile region. T chemistry of the water and its plankton we studied--tiny plants, animals, and bacteria After all data have been analyzed the inves gators hope to reach conclusions concerni the reasons for the extraordinary growth o life in certain areas of ocean upwellings.

The next and last phase of the vessel's African cruise was a deep-sea biological e pedition. Using bottom trawls of various kinds, midwater trawls, dredges, and grab in depths of from 90 to 12,000 feet, and us over 6 miles of wire cable, thousands of sp imens of deep-ocean and continental-shelf were collected. Those will be studied to in vestigate the relationships of the fauna of t eastern and western tropical Atlantic. Ma species were taken that are new to science

Many unusual deep-water fish species we collected, including a black swallower (whi can swallow another fish twice its size); th famous fish with the "tricycle landing gear which was photographed a few years ago fr a bathyscape; a barreleye (a fish with eyes tubes pointed forward like headlights); othe known as fang-tooth, snipe-eel, and viperfi Six rare gulper eel also were caught--mor than are found in all the world's museums.

Among the invertebrates collected were number of species of the rare vampire squ the poisonous pancake urchin of deep wate numerous cuttlefish, squid and deep-water gelatinous octopods, strange deep-sea cru taceans, brittlestars, sea cucumbers, dee water tooth shells, and other kinds of anim The results of the expedition are being pr pared and will be a valuable contribution t knowledge already at hand of tropical and d water ocean life.

Commissioned in July 1963, the John E ott Pillsbury had logged 254 days and 36,0 miles at sea at the end of this equatorial A lantic trip. About mid-July, she was sche uled to depart on a cruise in the waters be tween Bermuda and the Bahamas. (News Institute of Marine Science, Miami, Fla., J 1, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 41

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AST GUARD CUTTER OCCUPIES EAN WEATHER STATION:

The long-range program of the U. S. Coast rd for the full utilization of the oceano- hic potential offered by the weather sta- s moved one step further towards reali- on when the USCGC Ingham occupied O- Station CHARLIE during June 13-July 964. The Ingham has been outfitted to routine oceanographic stations, and will e first of the 327-foot Secretary-Class rs to undertake a full-scale oceano- ic program. She was to be followed at RLIE by her sistership the USCGC Spen- in July and August 1964.

ean Station CHARLIE is located at 52° ., 35°30' W., or about 500 miles south- of Cape Farwell, Greenland, on the sum- shipping lanes between Cape Race, New- dland, and Bishop's Rock, England. More ificantly from an oceanographic point of , it is located in the transition zone be- n the warm waters of the North Atlantic rent and the cold outflow from the Arctic on.

s in the case of the first project at Sta- BRAVO, the first surveys will be large- ploratory, since there is very little his- al data available on which to base a pling plan. The initial program will con- of daily oceanographic casts to 1,500 rs, with a cast to the bottom (about 3,500 rs) about every 10 days.

he data will be processed by the Coast d Oceanographic Unit, Washington, D. C., he results published in the U. S. Coast d Oceanographic Data Report Series. final data will be deposited with the Na- l Oceanographic Data Center, as are the from all Coast Guard cruises. (U. S. t Guard Oceanographic Unit, Washington, , June 15, 1964.)

* * * * *

INSTRUMENT EFFECTIVE AID CEAN-BOTTOM STUDIES:

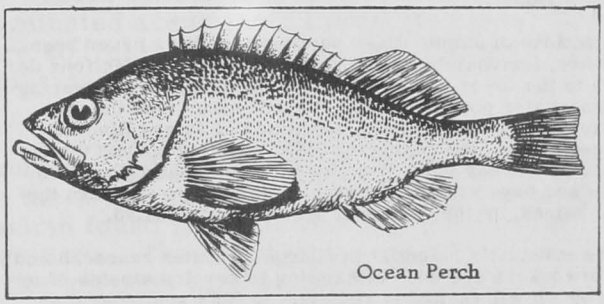
large bucket-type grab sampler is the ipal instrument used in collecting bot- dwelling animals and related bottom ments on the Continental Shelf off the h Atlantic seaboard. It is used in that in a bottom-dwelling fauna study being ucted by the U. S. Bureau of Commercial eries Biological Laboratory, Woods Hole, s., in cooperation with the Woods Hole Oceanographic Institution and the U. S. Geological Survey.

The instrument is made of thick steel plate, measures over 3 feet in its greatest dimension, weighs 550 pounds, and samples a 6-square-foot bottom area. A unique feature of the instrument is a camera and strobe light mounted within the bucket which takes a photograph of the bottom immediately before the device touches bottom. The combination of both photographs and bottom samples for the same spot has aided immeasurably in determining the abundance of animal life on various parts of the Continental Shelf, as well as mapping sediment types, and determining the living habits of various deep-sea creatures.

Ocean Perch

ANNUAL CHECK OF TAGGED OCEAN PERCH OFF MAINE:

A total of 400 fish were taken during the annual checkup in June 1964 of tagged ocean perch off Eastport, Me. The annual check is part of the North Atlantic fisheries investigations program of the U. S. Bureau of Commercial Fisheries on the growth rate of ocean perch. Of the 400 fish taken, 200 had been tagged previously and 16 were tagged in August 1956.



Ocean Perch

Some of the tagged fish taken in this year's check have been recaptured in the same place several times in past years. Out of the 16 fish tagged in August 1956, 15 were recaptured at least twice before, and 1 fish was recaptured 5 times. The average growth of those 16 fish for the 8-year period was barely 1.5 inches.

This project by the Bureau started as an investigation of the growth rate of ocean perch, and has been successful in providing scientific knowledge on ocean perch longevity and

their lack of movement away from even a very restricted locality.

Oysters

DEVELOPMENTS ON MSX DISEASE REPORTED BY SCIENTISTS:

Oyster grounds in the Chesapeake Bay area attacked by MSX have not yet recovered, and oysters planted on infected grounds continue to die. This is what the Senior Marine Scientist in charge of oyster research at the Virginia Institute of Marine Science, Gloucester Point, Va., told the members of the Oyster Institute of North America at their annual convention in New Orleans, July 10, 1964.

The scientist said that "For 5 years the protozoan disease (MSX) has been epidemic in saltier waters of lower Chesapeake Bay and our rivers, and it has not yet subsided. We have marked the areas invaded by MSX and the disease has not spread appreciably beyond the fringes of these boundaries during several years." He pointed out that MSX is inhibited by low salinities and disappears each spring from marginal areas due to freshening of the waters by runoff of the spring rains. Although the boundaries of the disease have not been widened, no clear evidence of recovery from the invasion can be detected.

Test plantings of seed oysters by Institute of Marine Science scientists indicate that oysters planted on MXS-infested grounds during the winter or early spring will become infected as the water warms up and will begin to die in late summer and fall with a few deaths occurring throughout the winter. Seed oysters planted in infested areas in late summer become infected immediately but do not begin to die until the following summer. About 40 percent of the oysters planted will die the first summer and 50 to 60 percent will die the second summer. Only about 10 to 20 percent of the original seed oysters planted will remain alive after 2 years. According to the Director of the Institute, Virginia's scientists hope to make use of those survivors in developing resistant strains.

Infections of James River seed oysters have never been extensive, fortunately for the oyster planters. Infections detected in the lower seed beds in the fall disappear by spring as fresh water pushes the salt content lower than the disease organism can tolerate. Plantings of James River oyster seed, even when carrying MSX, have not spread the disease to new areas since those seed were usually planted in rivers and bays where the water contains less salt than the lower James, so the causative organism was killed.

The Institute's scientist in charge of oyster research and his co-workers are busy attempting to develop strains of oysters which will be highly resistant to MSX and other diseases. Oysters which have survived the ravages of MSX for 5 years are being artificially spawned in the Gloucester Point Laboratory and if they show a resistance to the disease, they will eventually be made available to oyster farmers. Testing for resistance to MSX will require a minimum of 3 years even under present accelerated operations. (Virginia Institute of Marine Science, Gloucester Point, July 14, 1964.)

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BREEDING STOCK RESISTANT TO DISEASE:

Excellent progress is being made in spawning and raising oysters under controlled conditions, announced the Director of the Virginia Institute of Marine Science, Gloucester Point, Va., on July 20, 1964. He said, "This is an important step in our efforts to produce oysters resistant to disease. As further capabilities are developed, we can look to the day when improved stock, not only of oysters but also of clams, can be produced and manageable mariculture for seafoods will be a reality."

The oyster improvement program at the Virginia Institute of Marine Science is aimed specifically at breeding a special stock of oysters which will survive the protozoan disease MSX. Parents of those oysters are males and females which have survived 5 years in beds where 95 to 98 percent of their fellow oysters succumbed to the disease.

The Senior Marine Scientist in charge of oyster research at Gloucester Point obtained large oysters which have lived most of their lives in disease-infested waters to be the parents of what he hopes will become brood stock highly resistant to MSX. "During late winter we hired a commercial dredge boat and collected live oysters from Mobjack Bay and Egg Island beds which are assumed to have survived the ravages of MSX for 5 years he related. "Perhaps 95 to 98 percent of the oysters left on those grounds in 1959 have died from MSX infections. We hope these survivors have a natural immunity to the disease and we are testing to see if seed oysters spawned from these survivors will have higher natural resistance to MSX than James River seed," he added.

Laboratory and field work necessary for testing the survival value of these specially selected oysters requires a team effort. One of the Institute's oyster research scientists has devoted many months to studying techniques for caring for larval oysters and has incorporated the principles he has learned into the equipment of a new oyster research laboratory completed in June of this year. Even before completion of the new research laboratory, he began to successfully spawn oysters in early May and by mid-July had collected spat from many spawnings.

Another group of laboratory scientists is responsible for growing the algae (plankton) necessary to feed the young laboratory-reared oysters. A scientist of the Philadelphia College of Pharmacy and Science has been associated with the Institute this past summer in working out problems of the embryonic development of oysters. He is a visiting sci

ist at the Virginia Institute of Marine Sci-
e under the National Science Foundation
search Participation for College Teachers
ogram.

About 20 lots of surviving oysters from
X and Dermocystidium epidemics have
en collected for breeding. Nine lots of lab-
atory-bred progeny, about the size of a
all coin, were available for testing pur-
ses. It will require about 3 years to de-
mine whether or not this progeny is of a
ality suitable for commercial purposes. If
sistant stocks are obtained, breeding lots
a few bushels will be available to private
mmercial hatcheries for production. Se-
tion for size, growth rate, and fattness will
made concurrently with resistant studies.
tive stocks should be given strong prefer-
e in any breeding program, the Institute's
ster research scientists state. (Virginia
stitute of Marine Science, July 20, 1964.)

cific Northwest

PANESE FISHERY OBSERVERS
SIT UNITED STATES:

A Japanese Fishing Industry Goodwill
ssion to the United States and Canada ar-
ed in Seattle, Wash., on July 17, 1964, for
ix-day tour of Pacific Northwest fishery
ilities. The 12 members of the group rep-
sent both management and labor organiza-
ns in Japan's fishing industry.

The Regional Director, U. S. Bureau of
mmercial Fisheries, Seattle, Wash., said
Japanese group was scheduled to visit
umbia River fishery facilities in Washing-
and Oregon, and commercial fish opera-
s and other installations in the Seattle
a. After the United States visit, the Japa-
e mission was scheduled to go to Vancou-
, British Columbia, Canada. Before com-
to Seattle, the group had visited several
es in Alaska. The group had left Japan
July 1 and arrived in Anchorage, Alaska,
the same day. They were scheduled to re-
n to Japan on July 28.

Pollution

PESTICIDE ENDRIN BLAMED IN
MISSISSIPPI RIVER FISH KILL:

An official finding that the pesticide endrin was the cause of a massive fish kill in the lower Mississippi River last fall and winter and that industrial operations at Memphis, Tenn., were sources of the pollution was announced June 26, 1964, by the Secretary of the U. S. Department of Health, Education, and Welfare. The finding took the form of the Secretary's acceptance of the report of a conference held at New Orleans, La., May 5-6, 1964, under the enforcement provisions of the Federal Water Pollution Control Act.

On the two principal points involved--the specific cause of the fish kill and the source of the pollution--the report of the New Orleans conference stated:

"The conferees representing the States of Louisiana and Mississippi and the U. S. Department of Health, Education, and Welfare concluded that the pesticide endrin was responsible for the fish kill in the Mississippi and Atchafalaya Rivers, in Louisiana, during the fall and winter of 1963-64. The conferee representing Arkansas stated that endrin was at least a contributing factor. The conferee representing Tennessee stated that other factors might also be present.

"Industrial wastes and drainage from contaminated areas in and near Memphis, Tenn., are sources of the discharge of endrin into the Mississippi.

"The available data demonstrate that sources, not yet identified, other than those in the Memphis area, may contribute to the endrin found in the lower Mississippi drainage area. These other sources must be identified through further study."

The report stated that minute concentrations of endrin had been found in the treated water supplier of Vicksburg, Miss., and New Orleans, La. "While acute effects on humans of this pesticide in water have not been detected," the report said, "the effects of continued ingestion of even these minute quantities must be evaluated."

In transmitting the report to water pollution control officials of the four States involved, the Secretary of the U. S. Department of Health, Education, and Welfare endorsed

the recommendations of the conference that action be taken to bring known sources of endrin discharges from industry, land drainage, and mud deposits under control "immediately" and that "other sources of endrin pollution be identified and brought under control as soon as possible." The conferees also called for the establishment of a technical committee "to direct and advise in the identification and abatement of all sources of pollution affecting the main stem of the Lower Mississippi" and for a progress report to be prepared within a year. (Public Health Service, U. S. Department of Health, Education, and Welfare, June 26, 1964.)

Salmon

NEW FISH BEHAVORIAL FLUME BUILT IN PACIFIC NORTHWEST:

A fish behavorial flume on the Grande Ronde River five miles upstream from Troy, Oreg., was completed and operating successfully at the beginning of this past summer, announced the Regional Director, U. S. Bureau of Commercial Fisheries, Seattle, Wash., on July 1, 1964.

The flume was built by the Bureau as part of its fish-passage research program in an effort to preserve and enhance anadromous fish runs in the Columbia River and its tributaries. The program is being conducted in cooperation with the State fishery agencies of Washington, Oregon, and Idaho. Scientists hope the flume will help them find new ways to collect young salmon and steelhead heading downstream to the ocean so they can be passed around dams and other barriers.

The Grande Ronde flume is the largest of several the Bureau either has built or is building in the Pacific Northwest. Already constructed are flumes at Carson National Fish Hatchery in Washington State, Eagle Creek (near Estacada), Oreg., and on an irrigation diversion of the Umatilla River in Oregon. The Grande Ronde flume cost $378,000 to build and is a concrete and steel structure placed in the river to test various kinds of experimental fish guiding and collecting devices.

The research biologist and project leader for the research program in Portland said one of the devices likely to be tested in the flume is a velocity accelerator barriers. It would consist of a series of concrete weirs in the bottom of the flume which would cause the water to accelerate as it passes over each one, but also slow up in between each weir. As the young fish migrating downstream encounter the accelerated flow, they seek to avoid it. The weirs, placed on a long angle to the direction of flow, create a velocity barrier extending in the same direction. The fish (on rejecting this speedup in flow) will, it is hoped, be guided along the flow barrier into a bypass situated on the far side of the flume. There they can be collected for transportation around any manmade obstruction. This device was designed at the University of Washington hydraulics laboratory and was to be tested first at the smaller flume at Carson Hatchery. If it showed promise there, it was to be tested at Grande Ronde.

The research biologist at Portland said, "What we are looking for is a method of collecting fish that is less costly from the standpoint of maintenance as well as capital outlay than the traditional methods of louvers and traveling screens. One of the problems is to design a collecting device which will allow debris in the river to pass through it, yet will not harm the fish or allow them to escape. It is hoped the Grande Ronde flume will help provide an answer."

Also being tested in the flume were a louver structure and a perforated plate screen to determine their efficiency in guiding young migrant fish.

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, JUNE 1964:

Item and Period	1964	1963	1962	1961	1960
	. . . (1,000 Lbs. Heads-Off) . . .				
Total landings, So. Atl. and Gulf States:					
August	-	19,769	12,340	10,944	20,44
July	-	16,291	12,294	10,500	21,74
June	11,000	13,134	11,309	8,233	12,42
May	8,400	10,206	6,186	5,276	6,33
January-April	19,694	16,043	14,652	17,521	18,01
January-December	-	138,254	105,839	91,395	141,03
Quantity canned, Gulf States 1/:					
August	-	3,121	1,355	1,090	4,42
July	-	3,726	3,561	2,793	5,80
June	3,300	5,234	4,913	3,438	6,92
May	1,150	3,831	1,794	1,208	1,46
January-April	684	947	831	317	65
January-December	-	29,468	23,322	14,500	26,39

(Table continued on next page)

and Period	1964	1963	1962	1961	1960
			(1,000 Lbs. Heads-Off)		
en inventories (as of end of each mo.) 2/:					
gust 31	-	24,803	12,754	12,728	20,171
ly 31	-	25,460	13,677	14,849	17,397
ne 30	-	24,047	13,796	19,416	15,338
y 31	28,082	24,053	13,904	24,696	17,540
ril 30	28,950	24,954	15,637	27,492	20,502
rch 31	31,428	27,970	16,607	31,345	23,232
bruary 29	35,303	28,039	19,012	37,612	29,063
rts 3/:					
gust	-	8,598	7,381	6,743	6,407
y	-	11,002	8,265	6,635	7,319
e	-	9,439	9,397	8,065	8,932
y	-	11,110	11,020	8,278	9,902
ary-April	50,625	49,937	43,383	40,825	32,531
ary-December	-	151,530	141,103	126,268	113,418
		. .(¢/lb., 26-30 Count, Heads-Off). .			
ssel price, all species, So. Atl. and Gulf Ports:					
gust	-	59.0	83.6	66.1	52.0
y	-	63.5	82.1	55.8	54.6
e	4/60-72	77.0	84.4	53.7	64.1
y	4/58-68	80.9	83.7	52.8	62.9
ril	4/57-61	83.6	82.2	55.4	60.6
rch	4/57-61	85.5	80.9	56.0	56.3
bruary	4/57-62	85.7	78.9	53.5	51.8
lesale price, froz. brown (5-lb. pkg.), Chicago, Ill.:					
gust	-	75-81	110-112	76-91	64-67
y	-	77-97	-	70-75	72-77
e	80-85	95-102	102-104	67-72	76-77
y	72-83	100-103	96-103	67-69	74-77
ril	71-74	100-105	94-97	69-70	74-75
rch	72-75	102-106	94-95	69-71	65-68
bruary	73-82	102-106	93-95	69-71	65-67

is of headless shrimp determined by multiplying the number of standard cases by 13.
headless only; excludes breaded, peeled and deveined, etc.
dies fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
ge in prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, as, only.
June 1964 landings and quantity used for canning estimated from information publicly by the New Orleans Fishery Market News Service. To convert shrimp to on weight multiply by 1.68.

* * * * *

AL-RED SHRIMP FISHING OFF RIDA EAST COAST GOOD IN JUNE:

ishing for royal-red shrimp off the Floreast coast during June 1964 and the early of July was reported to have averaged t 50 boxes of shrimp a week per vessel. four-day trip by a commercial shrimp ng vessel was reported to have yielded e 83 boxes of royal-red shrimp.

oked Fish

TUS REPORT ON SMOKED FISH OCESSING STUDIES IN EAT LAKES REGION:

The progress on smoked fish processing dies to test the effects of certain process e / temperatures for the production of smoked fish is outlined in a report issued May 12, 1964, by the Regional Director, U. S. Bureau of Commercial Fisheries, Ann Arbor, Mich. The studies are being conducted at the Bureau's Great Lakes Technological Laboratory in Ann Arbor.

It has been evident for some time that industry lacked technical knowledge of the variables of existing smoked fish processing methods and the devices necessary to measure temperature of fish during smoking, as well as the equipment which would permit close control of the smoking operation. Data are needed to determine whether smoked chub processed and/or stored as specified by the various regulatory agencies would be an acceptable product. Processing studies are, therefore, being carried out to provide such information. An interim report on experimental smoking of chub has been released. This report was limited to results of current thermal processing studies. It did not include microbiological evaluations. Such research is in progress under contract and will be reported separately. The following tentative conclusions stemmed from current studies:

1. Chub can be heated to an internal temperature of 180° F. for 30 minutes in a direct smoking process and yield an acceptable product of good texture.

2. A large heat capacity (greatly in excess of existing commercial smokehouses in the Great Lakes area) is required to bring the internal fish temperature to 180° F. within a reasonable period of time. Rapid heating is necessary to insure a good yield and to avoid excessive drying of product.

3. Smokehouse temperature is not fish temperature. If rapid heating of the product is to be achieved (less than 3 hours), an initial temperature differential of at least 70° to 100° F. (of house over fish) is needed. This differential should not decrease to less than 50° to 60° F. at the end of a normal smoking period.

4. Slow, prolonged heating as a result of inadequate heat input will significantly reduce yield and result in an undesirable dry and salty product. Predrying at low temperatures does not appear to accomplish any useful purpose and reduces final yield. If a relatively high process temperature is required, e. g., 180° F., optimum conditions would appear to be rapid heating with simultaneous smoking,

instead of smoking separately as in past low-temperature smoking operations. Total time exposure to heat should be kept at a minimum to maximize yield.

5. Special "point-sensitive" temperature measuring devices (thermocouples) are absolutely necessary to give true internal fish temperatures, especially for small fish such as chub. Large temperature sensitive bulbs will probably give false readings, which may be 50° to 70° F. higher than internal fish temperatures.

6. Forced air circulation and baffling in the smokehouse are essential in order to avoid hot and cold spots. This should prove of concern to the processor insofar as regulations are concerned, and also because this problem will cause product nonuniformity and low yield due to overprocessing. Similarly, size grading should merit some consideration.

7. Chub vary widely in composition and in quality. Higher fat content is usually associated with the larger fish, although fish of uniform size are also quite variable. Size, quality, and composition of fish all affect salt uptake and product behavior during smoking.

8. Salt uptake during brining depends largely on time and concentration of brine. Two- to three-percent salt in the smoked product appears an acceptable range for most consumers. Brining chub overnight (16 to 18 hours) in 20° to 25° salinometer brine or for 2 hours in 40° to 50° salinometer brine will usually yield a satisfactory salt level in the smoked product.

9. A significant lowering of the pH of the smoked fish product by employing acetic, phosphoric, or lactic acids during the brining operation, was not found to be amenable to product quality. Severe texture and flavor changes were clearly evident, and product yield was significantly lowered. Decreasing pH of the smoked product to approximately 4.5 appears quite impractical.

10. Smoking of chub after packaging or reprocessing of presmoked chub to internal temperatures of 180° F. for 30 minutes yields inferior products.

11. The smoked product (chub) does not stiffen noticeably (i.e., "freeze") at 23° F., probably due to its relatively high fat and salt content. Thus, holding at 26° to 32° F. wou probably not harm quality (texture changes to freezing).

12. The finished smoked product should cooled and packaged rapidly to minimize fu ther loss of yield. Packaging should be fai loose to permit the product to "breathe" an thus to avoid excessive surface moisture (r tarding molding or slime formation).

Note: See Commercial Fisheries Review, February 1964 p. 4

South Atlantic Exploratory Fishery Program

SOUTH ATLANTIC FISHERY EXPLORATIONS CONTINUED BY RESEARCH VESSEL "OREGON":

The U. S. Bureau of Commercial Fisheri exploratory fishing vessel Oregon left Pasc goula, Miss., on July 1, 1964, for Brunswic Ga., to continue the Bureau's exploratory fi ing program initiated in 1960 along the Sout Atlantic coast. Exploratory cruises in the Caribbean Sea, conducted in the past by the Oregon, will be made from Brunswick until construction of a new Gulf of Mexico explor tory fishing vessel scheduled to start in 196 is completed.

U. S. Bureau of Commercial Fisheries exploratory fishing vess Oregon.

Under a Bureau program realignment, the artered exploratory fishing vessel Silver y has been returned to its owners. The lver Bay participated in the Bureau's Gulf Mexico and South Atlantic exploratory fishg and gear research programs over the past ven years. That vessel was used in locang and assessing the deep-water shrimp, allop, and bottomfish resources in the Gulf Mexico and along the Atlantic coast.

gging

.RLIN AND SAILFISH COOPERATIVE AGGING PROGRAM IN EASTERN PACIFIC: United States sport fishermen are achievg results in a game fish tagging program the eastern Pacific sponsored by the U. S. reau of Sport Fisheries and Wildlife, the International Game Fish Association, and the Woods Hole (Mass.) Oceanographic Institution. Four tagged marlin have been recovered within the past year by Japanese tuna longline vessels operating in the eastern Pacific. The recoveries included 2 marlin tagged off the east coast of Baja California, Mexico, which were recaptured 150 and 1,150 miles south of the point of tagging. In addition, a marlin was tagged and recovered in the mouth of the Gulf of California, and another tag was recovered in the same area from a marlin tagged off Acapulco, Mexico.

Within the past 2 years, over 1,500 striped marlin have been tagged off southern California, and off the west coast of Mexico in the area of southern Baja California, Mazatlan, and Acapulco.

Increased fishing by Japanese tuna longliners in the eastern Pacific should increase

Fig. 1 - Bilingual (English-Spanish) poster requesting tag returns in the Pacific Area Cooperative Tagging Program.

Fig. 2 - Bilingual (English-Japanese) poster requesting tag returns in the Pacific Area Cooperative Tagging Program.

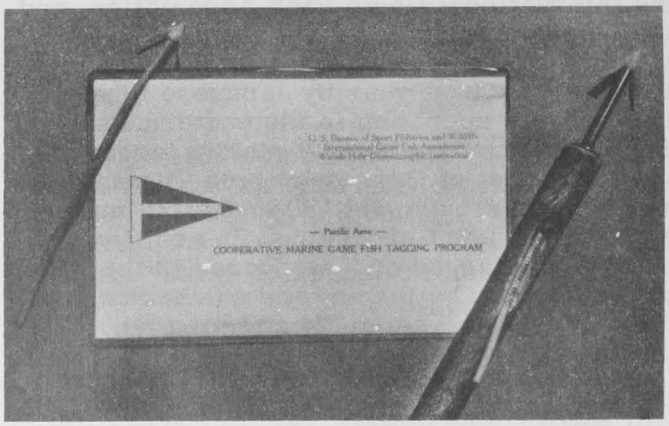
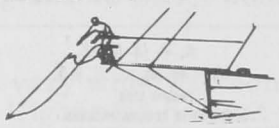


Fig. 3 - Shows the type of tag and tagging pole provided sport fishermen participating in the Pacific Area Cooperative Marine Game Fish Tagging Program.

tag recoveries and provide additional information on the migration of marlin and sailfish since long-line gear captures both those species in addition to tuna.



Tuna

ALBACORE EXPLORATORY CRUISE CONDUCTED BY OREGON FISH COMMISSION:

An exploratory 10-day cruise planned primarily to determine the movements of albacore tuna off the Oregon coast in early July 1964 was announced by the Oregon Fish Commission. The fishing vessel Chelan was chartered by the Commission for the cruise. The commercial fishing fleet was to be kept informed by radio of fishing success during the cruise.

The cruise plan called for operations 40 to 140 miles offshore where investigators were to collect basic oceanographic data, explore for albacore along a predetermined cruise track, obtain albacore for tagging as an aid in studying distribution and migratory habits of the species, and attempt to determine what relationship exists between oceanographic conditions and albacore occurrence. (Oregon Fish Commission, June 24, 1964.)

* * * * *

BLUEFIN TAGGED OFF BAJA CALIFORNIA RECAPTURED NEAR JAPAN:

A bluefin tuna tagged and released 70 miles northeast of Guadalupe Island, Baja California, was recovered 22 months later in the Sea of Japan off the northwestern corner of the island of Honshu.

The tuna was tagged and released on August 15, 1962, by a U.S. Bureau of Commercial Fisheries-California Department of Fish and Game research team, operating from the chartered purse-seiner West Point. The fish was recaptured on June 18, 1964, in a fixed trap net operated by Japanese fishermen near the coastal town of Fukaura, Nishi-Tsugaru County, Aomori Prefecture, Honshu. The bluefin traveled an estimated minimum Great Circle distance of 4,820 miles, growing from an estimated 23 pounds at the time it was tagged to 53 pounds at capture.

Fishery scientists of the Federal Government and California Department of Fish and Game initiated a cooperative bluefin tuna tagging program August 13-23, 1962. A total of 960 fish were then released. As of this past summer, a total of 168 tags had been recovered by California fishermen. This tag from the recaptured bluefin is the first to be returned from Japan.

One other tagged bluefin tuna has made a trans-Pacific migration. That fish was tagged by Inter-American Tropical Tuna Commission personnel in 1958 near Guadalupe Island, Baja California. It was recovered 5 years and 2 months later north of the Bonin Islands and had grown in weight from 30-35 pounds at tagging to about 265-267 pounds when captured.

Note: See Commercial Fisheries Review, August 1963 p. 53.

United States Fisheries

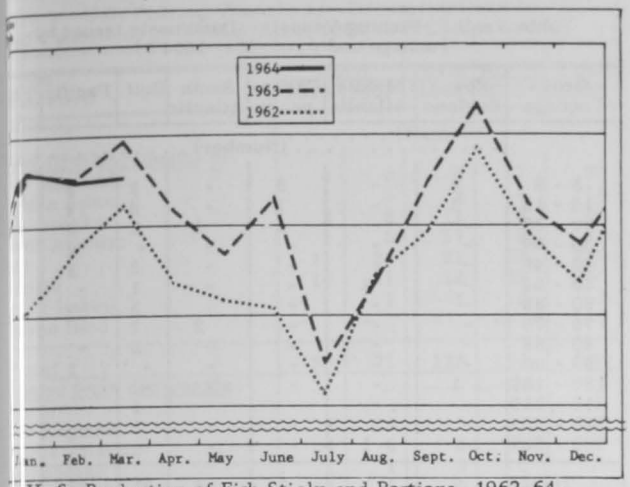
FISH STICKS AND PORTIONS, JANUARY-MARCH 1964:

United States production of fish sticks and fish portions amounted to 46.8 million pounds during the first quarter of 1964, according to preliminary data. Compared with the

Table 1 - U.S. Production of Fish Sticks by Months and Type, January-March 1964 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
January	6,710	516	7,22
February	6,597	464	7,06
March	6,419	544	6,96
Total 1st Qtr. 1964 1/	19,726	1,524	21,25
Total 1st Qtr. 1963 2/	22,683	1,165	23,84
Total 1963 2/	74,132	5,163	79,29

1/Preliminary.
2/Revised.



U. S. Production of Fish Sticks and Portions, 1962-64.

Table 2 - U. S. Production of Fish Sticks by Areas, January-March 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs
ntic Coast States . . .	23	16,746	23	19,163
nd & Gulf States . . .	5	2,347	7	2,460
fic Coast States . . .	11	2,157	11	2,225
Total	39	21,250	41	23,848

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ble 3 - U.S. Production of Fish Sticks by Months, 1960-64

nth	1/1964	2/1963	1962	1961	1960
			(1,000 Lbs.)		
nary	7,226	7,554	6,082	6,091	5,511
ruary	7,061	8,241	6,886	7,097	6,542
rch	6,963	8,053	7,658	7,233	7,844
il	-	6,546	5,719	5,599	4,871
. . . . .	-	5,750	5,643	5,129	3,707
. . . . .	-	6,125	5,117	4,928	4,369
. . . . .	-	4,870	3,740	3,575	3,691
ust	-	5,696	5,760	6,927	5,013
mber . . .	-	5,865	6,582	5,206	5,424
ber	-	8,128	6,698	6,133	6,560
mber . . .	-	6,471	6,305	6,288	6,281
mber . . .	-	5,996	6,027	5,618	5,329
Total	-	79,295	72,217	69,824	65,142

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ised.

ble 4 - U.S. Production of Fish Portions by Months and Type, January-March, 1964 1/

th	Cooked	Breaded Raw	Total	Un-breaded	Total
			(1,000 Lbs.)		
nary	1,536	6,733	8,269	257	8,526
ruary	1,739	6,238	7,977	420	8,397
rch	2,111	6,294	8,405	179	8,584
1st Qtr. 1964 1/	5,386	19,265	24,651	856	25,507
1st Qtr. 1963 2/	4,139	19,416	23,555	814	24,369
l 1963 2/	16,623	74,970	91,593	3,054	94,647

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Table 5 - U. S. Production of Fish Portions by Areas, January-March, 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	15,893	23	13,696
Inland & Gulf States	6	8,957	10	9,768
Pacific Coast States	10	657	8	905
Total	39	25,507	41	24,369

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1960-1964

Month	1/1964	2/1963	1962	1961	1960
			(1,000 Lbs.)		
January	8,526	8,173	5,077	4,303	3,632
February	8,397	7,361	6,360	4,902	3,502
March	8,584	8,835	7,036	5,831	4,706
April	-	7,919	6,408	4,484	3,492
May	-	7,293	5,818	3,879	3,253
June	-	8,774	6,137	4,039	3,995
July	-	4,524	4,679	3,962	4,088
August	-	6,684	6,687	4,963	3,558
September . . .	-	9,621	7,180	5,745	4,631
October	-	9,877	9,871	6,759	5,275
November . . .	-	8,136	7,406	5,789	4,790
December . . .	-	7,450	6,019	5,191	4,459
Total . . .	-	94,647	78,678	59,847	49,381

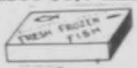
1/Preliminary.
2/Revised.

same quarter of 1963, this was a decrease of 1.5 million pounds or 3.0 percent. Fish portions (25.5 million pounds) were up 1.1 million pounds or 4.7 percent, while fish sticks (21.3 million pounds) were down 2.6 million pounds or 10.9 percent.

Cooked fish sticks (19.7 million pounds) made up 92.8 percent of the January-March 1964 fish stick total. There were 24.7 million pounds of breaded fish portions produced, of which 19.3 million pounds were raw. Unbreaded fish portions amounted to 856,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 16.7 and 15.9 million pounds, respectively. The Inland and Gulf States ranked second with 2.3 million pounds of fish sticks and 9.0 million pounds of fish portions. The remaining 2.8 million pounds of fish sticks and fish portions were produced by firms in the Pacific States.

Total production of fish sticks and fish portions during 1963 (173.9 million pounds) was 23.0 million pounds or 15.3 percent above 1962. Fish sticks (79.3 million pounds) were up 7.1 million pounds or 9.8 percent; and fish portions (94.6 million pounds) increased 16.0 million pounds or 20.3 percent.



U.S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

May 1964: During May 1964, a total of 78 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 86 in May 1963. There were 30 documents cancelled for fishing vessels in May 1964, as compared with 42 in May 1963.

Table 1 - U.S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, May 1964 with Comparisons

Area (Home Port)	May 1964	May 1963	Jan.-May 1964	Jan.-May 1963	Total 1963
	(Number)				
Issued first documents 2/:					
New England	7	3	13	10	23
Middle Atlantic	2	3	5	7	18
Chesapeake	7	8	18	17	66
South Atlantic	4	9	21	27	77
Gulf	31	31	92	97	239
Pacific	27	31	53	78	160
Great Lakes	-	-	1	2	5
Puerto Rico	-	1	-	1	2
Total	78	86	203	239	590
Removed from documentation 3/:					
New England	3	5	8	24	48
Middle Atlantic	-	1	4	22	47
Chesapeake	4	4	7	10	25
South Atlantic	1	8	10	27	53
Gulf	6	13	27	55	118
Pacific	15	9	54	43	87
Great Lakes	1	2	6	7	15
Hawaii	-	-	-	1	3
Total	30	42	116	189	396

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, May 1964 2/

Length in feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
26 - 26.9	1	-	-	-	-	-	1
27 - 27.9	-	-	-	-	1	-	1
28 - 28.9	-	-	-	-	-	6	6
29 - 29.9	1	-	-	-	-	3	4
31 - 31.9	-	-	-	-	3	2	5
32 - 32.9	2	-	2	-	1	-	5
33 - 33.9	-	-	2	-	2	4	8
34 - 34.9	1	-	1	-	-	-	2
35 - 35.9	-	-	-	-	-	1	1
36 - 36.9	-	-	1	-	-	3	4
38 - 38.9	1	-	1	-	2	-	4
39 - 39.9	-	-	-	-	2	-	2
40 - 40.9	-	-	-	-	-	3	3
41 - 41.9	-	-	-	-	1	-	1
44 - 44.9	-	-	-	-	1	-	1
45 - 45.9	-	-	-	-	-	1	1
47 - 47.9	-	-	-	1	-	1	2
49 - 49.9	-	-	-	-	-	1	1
50 - 50.9	-	-	-	-	1	-	1
53 - 53.9	-	-	-	-	1	-	1
55 - 55.9	-	-	-	-	1	-	1
56 - 56.9	-	-	-	-	1	-	1
59 - 59.9	-	-	-	-	1	-	1
60 - 60.9	-	-	-	-	1	-	1
61 - 61.9	-	1	-	-	-	1	2
62 - 62.9	-	-	-	-	2	-	2
63 - 63.9	-	-	-	-	1	-	1
64 - 64.9	-	-	-	-	1	-	1
65 - 65.9	-	-	-	3	6	-	9
68 - 68.9	-	-	-	-	-	1	1
85 - 85.9	1	-	-	-	-	-	1
135 - 135.9	-	-	-	-	2	-	2
168 - 168.9	-	1	-	-	-	-	1
Total	7	2	7	4	31	27	78

Note: For explanation of footnote, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, May 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
5 - 9	4	-	5	-	2	2	13
10 - 19	2	-	1	-	9	14	26
20 - 29	-	-	1	1	2	6	10
30 - 39	-	-	-	-	-	2	2
40 - 49	-	-	-	-	3	2	5
50 - 59	-	1	-	-	1	-	2
60 - 69	-	-	-	-	3	-	3
70 - 79	-	-	-	3	7	-	10
80 - 89	-	-	-	-	2	-	2
90 - 99	-	-	-	-	-	1	1
180 - 189	1	-	-	-	-	-	1
310 - 319	-	-	-	-	1	-	1
320 - 329	-	-	-	-	1	-	1
520 - 529	-	1	-	-	-	-	1
Total	7	2	7	4	31	27	78

Note: For explanation of footnote, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, May 1964 2/

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
60	-	-	-		1	-	1
73	-	-	-	-	1	-	1
80-89	-	-	-	-	2	-	2
90-99	1	-	-	-	-	1	2
110-119	-	-	4	-	2	-	6
130-139	1	-	1	-	2	8	12
150-159	-	-	2	-	2	-	4
165	-	-	-	-	2	12	14
170	-	-	-	-	3	-	3
188	1	-	-	-	-	-	1
190	-	-	-	-	-	1	1
216	-	-	-	-	-	1	1
220-229	2	1	-	1	8	-	12
235	-	-	-	-	1	-	1
240	-	-	-	-	-	1	1
250	-	-	-	-	-	1	1
280	-	-	-	-	-	1	1
290	-	-	-	-	1	-	1
300-309	-	-	-	3	3	-	6
315	1	-	-	-	-	-	1
330	-	-	-	-	1	-	1
495	-	-	-	-	-	1	1
765	1	-	-	-	-	-	1
914	-	-	-	-	1	-	1
1000	-	1	-	-	-	-	1
1350	-	-	-	-	1	-	1
Total	7	2	7	4	31	27	78

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes 1 redocumented vessel in May 1964 that was previously removed from the records. Vessels issued first documents as fishing craft were built: 63 in 1964; 4 in 1963; 1 in 1962; 1 in 1957; and 9 prior to 1956.
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.

* * * * *

April 1964: During April 1964, a total of 35 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 71 in April 1963. There were 47 documents cancelled for fishing vessels in April 1964, as compared with 56 in April 1963.

ble 1 - U.S. Fishing Vessels 1/--Documentations Issued nd Cancelled, by Areas, April 1964 with Comparisons

Area (ne Port)	April 1964	April 1963	Jan.-Apr. 1964	Jan.-Apr. 1963	Total 1963
	(Number)				
ed first documents 2/:					
w England	4	3	6	7	23
ddle Atlantic	1	2	3	4	18
sapeake	2	3	11	9	66
th Atlantic	1	5	17	18	77
lf	11	26	61	66	239
ific	16	31	26	47	160
at Lakes	-	1	1	2	5
rto Rico	-	-	-	-	2
otal	35	71	125	153	590
oved from documenta- n 3/:					
w England	3	14	5	19	48
ddle Atlantic	4	6	4	21	47
sapeake	2	1	3	6	25
th Atlantic	4	5	9	19	53
lf	13	19	21	42	118
ific	19	8	39	34	87
at Lakes	2	2	5	5	15
waii	-	1	-	1	3
otal	47	56	86	147	396

For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, April 1964 2/

gth eet	New England	Middle Atlantic	Chesa-peake	South Atlantic	Gulf	Pacific	Total
	(Number)						
27.9	1	-	-	-	-	1	2
28.9	-	-	-	-	-	1	1
29.9	-	-	-	-	-	1	1
31.9	1	-	1	-	-	-	2
33.9	1	-	-	-	2	-	3
34.9	-	-	-	-	-	1	1
35.9	-	-	1	-	-	-	1
36.9	-	-	-	-	-	3	3
38.9	-	-	-	-	1	-	1
39.9	-	-	-	-	-	1	1
40.9	-	-	-	-	-	1	1
41.9	-	-	-	-	1	-	1
42.9	-	-	-	-	-	1	1
43.9	-	-	-	-	-	2	2
46.9	-	-	-	-	-	2	2
47.9	-	-	-	-	-	1	1
48.9	1	-	-	-	-	-	1
49.9	-	-	-	-	-	1	1
60.9	-	-	-	-	1	-	1
62.9	-	-	-	-	1	-	1
63.9	-	-	-	-	1	-	1
65.9	-	-	-	1	3	-	4
68.9	-	-	-	-	1	-	1
168.9	-	1	-	-	-	-	1
tal	4	1	2	1	11	16	35

or explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, April 1964 2/

ss age	New England	Middle Atlantic	Chesa-peake	South Atlantic	Gulf	Pacific	Total
	(Number)						
- 9	2	-	2	-	-	3	7
- 19	1	-		-	4	4	9
- 29	-	-	-	-	-	4	4
- 39	1	-	-	-	-	2	3
- 49	-	-	-	-	-	2	2
- 59	-	-	-	-	1	1	2
- 69	-	-	-	-	3	-	3
- 79	-	-	-	1	3	-	4
- 549	-	1	-	-	-	-	1
otal	4	1	2	1	11	16	35

For explanation of footnote, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, April 1964 2/

Horse-power	New England	Middle Atlantic	Chesa-peake	South Atlantic	Gulf	Pacific	Total
	(Number)						
55	-	-	-	-	-	1	1
65	-	-	-	-	-	1	1
86	-	-	-	-	-	1	1
110	1	-	-	-	1	1	3
120	-	-	-	-	-	1	1
125	1	-	1	-	-	-	2
130	-	-	-	-	2	-	2
140	-	-	1	-	-	-	1
165	-	-	-	-	-	1	1
170	-	-	-	-	2	-	2
175	-	-	-	-	1	1	2
180	-	-	-	-	-	3	3
220	1	-	-	-	2	1	4
225	-	-	-	-	-	2	2
230	-	-	-	-	1	-	1
245	-	-	-	-	1	-	1
300	-	-	-	1	1	1	3
320	1	-	-	-	-	1	2
500	-	-	-	-	-	1	1
800	-	1	-	-	-	-	1
Total	4	1	2	1	11	16	35

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/There were no redocumented vessels in April 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 27 in 1964; 2 in 1963; 1 in 1962; 1 in 1954; and 4 prior to 1951.
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.

U. S. Foreign Trade

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 4, 1964, amounted to 17,793,706 pounds (about 847,300 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (20.7 percent) than the 22,414,914 pounds (about 1,067,400 standard cases) imported during January 1-June 29, 1963.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the $12\frac{1}{2}$-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, MAY 1964:

United States imports of processed edible fishery products in May 1964 were down 7.7 percent in quantity and 7.4 percent in value from those in the previous month. There was an increase in imports of frozen fish blocks this May, and those for frozen wolffish fillets (sea catfish) and fresh and frozen swordfish were up substantially. The May 1964 imports of all groundfish fillets were down from the previous month, as were those for fresh and frozen tuna, canned tuna in brine, canned sardines not-in-oil, and canned crab meat.

Compared with the same month in 1963, imports in May 1964 also were down 7.7 percent. Imports were generally low-

er for most of the leading items, including frozen groundfish fillets and fish blocks, lobster and spiny lobster, frozen shrimp, fresh and frozen swordfish, canned sardines, and canned crab meat. These were offset partly by some gain in imports of fresh and frozen tuna, mostly albacore.

In the first 5 months of 1964, imports were about unchanged in quantity from those in the same period a year earlier, but the value was up 2.7 percent. During January-May 1964 there were larger imports of frozen fish blocks and fresh and frozen tuna, but imports of canned tuna were lower as were canned sardines and canned crab meat.

U. S. Imports and Exports of Processed Edible Fishery Products, May 1964 with Comparisons

Item	Quantity				Value			
	May		Jan.-May		May		Jan.-May	
	1964	1963	1964	1963	1964	1963	1964	1963
	(Millions of Lbs.)				(Millions of $)			
Fish & Shellfish:								
Imports[1]	37.2	48.3	205.5	205.6	11.3	12.1	60.7	59.1
Exports[2]	2.6	2.0	17.5	14.6	1.2	0.7	7.6	5.6

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in May 1964 were down 13 percent in quantity and 30 percent in value from those in the previous month. In May there were fairly sharp decreases in exports of canned salmon (down 37 percent), canned mackerel (down 43 percent), and canned sardines (down 54 percent). The declines were partly offset by increased shipments of canned squid (up 342 percent), mostly all to Greece.

Compared with the same month of the previous year, the exports in May 1964 were up 30 percent in quantity and 71 percent in value. This May there were larger shipments of most of the leading canned fish export items except canned squid and canned sardines not-in-oil. Exports of canned salmon to the United Kingdom this May increased 282 percent from those in the same month a year earlier.

Processed fish and shellfish exports in the first 5 months of 1964 were up 20 percent in quantity and 36 percent in value from those in the same period of 1963. In January-May 1964 there were much larger shipments of canned mackerel (up 227 percent) and shipments of canned salmon and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.

Notes: (1) Prior to October 1963, the data shown above were included in news articles on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed edible fishery products are reported above. The above import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See Commercial Fisheries Review, August 1964 p. 43.

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VALUE OF U. S. FISHERY PRODUCTS EXPORTS UP SHARPLY IN 1963:

The total value of United States exports of fishery products (edible and inedible) was up sharply in 1963--58 percent higher than in 1962. The export value of edible fishery products increased 35 percent from the previous year and the value of inedible products was double that of 1962.

Value of United States Exports of Edible and Inedible Fishery Products, 1962-63

Product	1963	1962
	(U.S. Dollars)	
Edible:		
Salmon, fresh or frozen	2,530,062	871,8
Other fish, fresh or frozen	1,858,082	1,135,1
Shrimp, fresh or frozen	7,748,434	3,299,1
Salmon, canned	8,238,970	7,292,2
Shrimp, canned	3,053,650	2,572,1
Squid, canned	742,394	728,8
Shellfish, canned	1,263,009	1,506,6
Mackerel, canned	681,283	671,1
Sardines, canned	715,801	1,503,2
Salmon, salted, pickled or dry-cured	509,334	528,1
Other fish and shellfish	3,037,590	2,362,3
Total Edible	30,378,609	22,470,8
Inedible:		
Fish and fish-liver oils	15,636,141	6,046,8
Seal furs, dressed or dyed	5,876,523	3,850,9
Shells, unmanufactured	2,136,534	1,284,6
Fish, shellfish, and other marine-animal products	1,845,609	1,506,7
Other inedible	732,743	568,3
Total Inedible	26,227,550	13,257,5
Grand Total	56,606,159	35,728,4

Source: U. S. Exports of Domestic and Foreign Merchandise, FT 110, years 1962 and 1963.

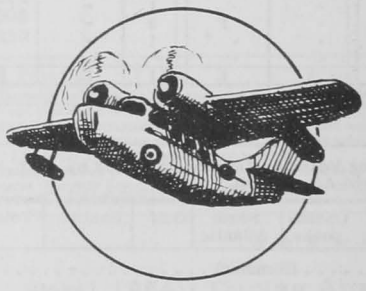
Principal items accounting for substantial increases in the edible fishery products group included shrimp (fresh, frozen, and canned) and salmon (fresh, frozen, and canned).

Among the inedible products, the export value of fish and fish-liver oils was up 159 percent from a year earlier. The 1963 export value of all other items in the inedible product group was much higher than in 1962.

* * * * *

AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-MARCH 1964:

Airborne fishery imports into the United States in March 1964 amounted to 485,10 pounds valued $233,800, down 21.6 percent in quantity and 2 percent in value from those in previous month.



Total airborne imports in January-March 196 were down 28.2 percent in quantity and 34.9 percent in value from those in the same period 1963.

The data as issued do not show the state all products--fresh, frozen, or canned--but is believed that the bulk of the airborne imports consists of fresh and frozen products

Table 1 - U. S.[1] Airborne Imports of Fishery Products, January, February, and March 1964

ct and gin[2]	January		February		March	
	Qty.[3]	Value[4]	Qty.[3]	Value[4]	Qty.[3]	Value[4]
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
tugal	-	-	0.1	0.1	-	-
ico	-	-	42.1	11.6	37.4	10.8
ish Honduras	-	-	1.1	0.2	0.7	0.2
ed Kingdom	1.0	1.8	0.5	0.9	0.2	0.5
ce	3.6	6.9	0.3	0.3	-	-
el	-	-	1.3	0.8	-	-
zuela	-	-	4.6	1.7	-	-
mark	-	-	-	-	0.2	0.1
da	7.8	2.8	3.8	1.1	1.6	0.4
and	0.8	0.6	1.0	0.6	-	-
al fish	13.2	12.1	54.8	17.3	40.1	12.0
p:						
alvador	34.6	20.0	12.0	10.0	40.5	20.9
aragua	1.0	0.9	-	-	5.6	3.2
a Rica	65.1	34.9	56.2	33.6	18.6	9.3
ama	141.4	78.5	47.9	28.7	60.3	38.0
ezuela	477.2	160.4	379.8	175.8	281.0	130.4
al shrimp	719.3	294.7	495.9	248.1	406.0	201.8
ish other than shrimp:						
ico	-	-	5.8	2.0	3.2	2.8
ish Honduras	33.0	23.8	23.0	20.8	11.6	2.4
duras	6.7	7.3	1.7	1.3	-	-
aragua	22.9	18.1	10.6	7.2	6.7	5.6
a Rica	-	-	9.3	9.5	-	-
aica	16.1	11.2	9.7	9.1	6.2	5.9
ish Guiana	-	-	-	-	8.6	1.6
ada	-	-	-	-	1.2	0.9
inican Republic	-	-	0.5	0.1	-	-
amas	-	-	6.5	3.1	-	-
	-	-	1.2	0.6	1.5	0.8
al shellfish excl. shrimp)	78.7	60.4	68.3	53.7	39.0	20.0
and Total	811.2	367.2	619.0	319.1	485.1	233.8

Explanation of footnotes, see table 2.

Table 2 - U. S.[1] Airborne Imports of Fishery Products, January-March 1964 with Comparative Data

ct and gin[2]	Jan.-Mar. 1964		Jan.-Mar. 1963	
	Qty.[3]	Value[4]	Qty.[3]	Value[4]
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
tugal	0.1	0.1	-	-
ico	79.5	22.4	78.6	23.7
ish Honduras	1.8	0.4	26.2	6.6
duras	-	-	14.1	3.6
	-	-	2.0	8.2
ed Kingdom	1.7	3.2	0.9	2.1
	-	-	1.2	7.4
ce	3.9	7.2	0.4	0.3
el	1.3	0.8	-	-
zuela	4.6	1.7	-	-
and	-	-	0.8	0.3
mark	0.2	0.1	-	-
da	13.2	4.3	-	-
and	1.8	1.2	-	-
al fish	108.1	41.4	124.2	52.2
p:				
temala	-	-	85.9	45.5
alvador	87.1	50.9	127.6	89.2
duras	-	-	5.8	3.3
aragua	6.6	4.1	73.3	21.7
ta Rica	139.9	77.8	246.8	118.5
ama	249.6	145.2	488.3	259.9
ezuela	1,138.0	466.6	1,108.6	538.0
ador	-	-	42.7	15.0
ince	-	-	2.6	0.9
al shrimp	1,621.2	744.6	2,181.6	1,092.0

(Table continued on next column.)

Product and Origin[2]	Jan.-Mar. 1964		Jan.-Mar. 1963	
	Qty.[3]	Value	Qty.[3]	Value
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Shellfish other than shrimp:				
Mexico	9.0	4.8	66.5	39.0
British Honduras	67.6	47.0	90.0	69.4
El Salvador	-	-	3.6	2.8
Honduras	8.4	8.6	1.6	0.8
Nicaragua	40.2	30.9	38.3	31.4
Costa Rica	9.3	9.5	73.8	60.1
Jamaica	32.0	26.2	38.6	31.9
Netherlands Antilles	-	-	29.1	18.3
Colombia	-	-	0.8	2.5
Ecuador	-	-	1.1	1.5
Tunisia	-	-	-	-
British Guiana	8.6	1.6	-	-
Canada	1.2	0.9	-	-
Venezuela	-	-	13.7	6.0
Dominican Republic	0.5	0.1	6.2	5.0
Bahamas	6.5	3.1	-	-
Haiti	2.7	1.4	-	-
Total shellfish (excl. shrimp)	186.0	134.1	363.3	268.7
Grand total	1,915.3	920.1	2,669.1	1,412.9

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When the country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
4/F. o. b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the overall import figures for total imports, i. e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, January, February, and March 1964, U. S. Bureau of the Census.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, JULY 1964:

The July 1964 wholesale price index for edible fish and shellfish (fresh, frozen, and canned) moved up only 0.9 percent from the previous month. Substantial price increases this July for most fresh or frozen salt-water and fresh-water fishery products were offset by price declines in the processed fresh fish and shellfish group. But prices for processed frozen fishery products were all higher than in June 1964. At 106.6 percent of the 1957-59 average, the index this July was 3.1 percent lower than for the same month a year earlier. Prices this July were generally below those in July 1963 except for several fresh and frozen salt-water fishery products and a number of the canned fish items.

Considerably higher prices prevailed this July than in the previous month for ex-vessel large haddock (up 17.8 percent) at Boston and for western fresh halibut (up 5.6 percent) at New York City because of lighter-than-normal seasonal landings. July 1964 prices also were above those for June for western fresh king salmon (up 3.6 percent), Great Lakes drawn whitefish (up 23.5 percent), and fresh round yellow pike (up 20.0 percent). Those higher prices were responsible for the 8.1 percent increase from June to July in the subgroup index for drawn, dressed, or whole finfish. As compared with July 1963, the subgroup index this July was up 4.5 percent because of higher prices for all items except fresh-water fish.

Much lower prices from June to July for South Atlantic fresh shrimp (down 16.0 percent) at New York City were directly responsible for the 8.1 percent decline in the subgroup index for processed fresh fish and shellfish. The steep price drop for shrimp was partly offset by higher prices for small haddock fillets (up 7.9 percent) at Boston as a result of the higher ex-vessel prices for fresh haddock. Compared with Ju-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			July 1964	June 1964	July 1964	June 1964	May 1964	July 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					106.6	105.6	105.4	110.0
Fresh & Frozen Fishery Products:					109.3	107.8	107.4	114.3
Drawn, Dressed, or Whole Finfish:					114.9	106.3	107.5	110.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.10	88.6	75.2	60.5	83.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.36	118.3	107.0	101.5	106.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.93	.89	129.2	124.7	127.8	122.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.43	78.3	63.4	92.5	88.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.51	.43	83.5	69.6	94.2	100.7
Processed, Fresh (Fish & Shellfish):					105.5	114.8	117.2	120.8
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.35	.32	83.8	77.7	71.6	93.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.84	1.00	98.4	117.2	116.0	106.7
Oysters, shucked, standards	Norfolk	gal.	7.00	7.00	118.0	118.0	126.5	143.3
Processed, Frozen (Fish & Shellfish):					102.5	98.7	94.7	107.9
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.37	95.0	92.5	92.5	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.35	108.5	101.1	104.1	102.6
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.30	108.7	105.2	105.2	116.6
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.84	.82	99.0	96.6	88.3	109.7
Canned Fishery Products:					102.2	102.2	102.2	102.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.25	22.25	97.0	97.0	97.0	104.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.50	11.50	102.1	102.1	102.1	99.0
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.0	105.9	103.9	2/100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.81	8.81	113.0	113.0	113.7	104.0

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/ Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.

ly 1963, price, in the subgroup this July were down for all products and the index was lower by 12.7 percent.

All products in the subgroup for processed frozen fish and shellfish were higher-priced this July and the index rose 3.9 percent from the previous month. Prices for haddock fillets at Boston were up 7.3 percent from June to July, and were higher by 5.8 percent as compared with July 1963. Prices this July were higher for other species of fillets in the subgroup and wholesale prices for frozen shrimp at Chicago rose 2 cents a pound from the previous month. The subgroup index this July was lower than for the same month a year earlier by 5.0 percent--prices were lower for all products but haddock fillets (up 5.8 percent).

The July 1964 subgroup index for canned fishery produc at 102.2 percent of the 1957-59 average was unchanged fr the previous month. Prices for each of the canned fish ite were at about the same price level as the previous two m except for California canned jack mackerel which increas slightly from May to June as a result of low inventories.

Prices for canned Maine sardines were steady during with a reported new season pack of some 300,000 cases t ward the end of that month--less than half the pack for th same period in 1963. As compared with July 1963, the su group index this July was lower by 0.6 percent because o decline in prices for canned pink salmon (down 7.3 perce due to large inventories as the new season got under way Prices for other canned fishery products this July were l er than in July 1963.

Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

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