Alaska

BRISTOL BAY SALMON RUN NEARS RECORD:

The 1965 season will go on record as a bonanza year in the Bristol Bay sockeye salmon fishery. By July 26, the return of sockeye salmon to Bristol Bay this season was approximately 52 million fish, according to preliminary catch and escapement data. Inclusion of the estimated high-seas catch of Bristol Bay red salmon raises the total to 60 million.

The escapement to all Bristol Bay rivers amounted to 28 million fish with escapements to the main river as follows: Kvichak, 23.8 million; Egegik, 1.4 million; Ugashik, 817,000; Naknek, 720,500; Wood River, 674,000.

Because of a lack of cans, virtually all canning operations ceased before July 26, with many operators calling a halt to work the week before. The total catch reached 23.7 million sockeye salmon, just one million fish short of the record catch of 24.7 million established in 1938. But because of the small size of the sockeye salmon and the reduction in gill-net mesh size, the case pack of 1.4 million fell well below the 1938 record pack of 1.8 million cases. This has been the first year since 1948 that the Bristol Bay red salmon pack has been greater than one million cases. Owing largely to the preponderance of 2-ocean sockeye salmon and the smaller mesh size, the yield ran approximately $16\frac{1}{2}$ fish per case.

There were 2,680 units of gear registered to fish the Bay during the 1965 season. About 1,900 of these were drift boats, the remainder set nets. Limits of 2,000 to 2,500 salmon per boat per day were imposed for a period of nearly three weeks beginning June 30.

The dominant age class for the three districts on the east side was the sockeye salmon arising from the 1960 spawning. Practically all of the 40 million sockeye returning to the Kvichak were of that age group. Of interest is the large return (more than 45 million) from the 1960 Kvichak escapement of 14.5 million spawners. It remains to be seen whether this year's large run resulted from a disproportionate return of 2-ocean sockeye salmon or whether a respectable showing of 63 fish may be expected in next year's run.

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SOCKEYE SALMON DISTRIBUTION PATTERN IN BRISTOL BAY AREA STUDIED:

Several rivers flowing into Bristol Bay were as red this past summer as the sockeye salmon found in them. But the red color was introduced by fishery scientists of the U. S. Bureau of Commercial Fisheries field station at King Salmon, Alaska, to trace the offshore movement of the various river waters flowing into Bristol Bay. The influence of the river waters on salmon distribution was noted. The red dye (Rhodamine B) does not last long.

The Bureau's research biologist stationed at King Salmon said, "These studies are being carried out to determine how well the various rivers such as the Naknek, Kvichak, Egegik, and Ugashik maintain their identity in the waters of Bristol Bay and how this might control the distribution and behavior of the young and adult red salmon in the Bay."

If the rivers maintain a definite course through the Bay, the salmon may identify their home stream far out into the bay and "home" on it back to their parent stream. They orient on their home stream by the sense of smell, scientists say, using their highly sensitive olfactory glands. But where do they come under the influence of their home stream? Is it 30, 40, or 50 miles out in the Bay? The tests being made may tell. (This is the "home stream theory"--salmon detect their home stream and are guided

e natal gravel.) So the rivers flowing in crete course through the Bay may con- the distribution and behavior of adult on that are coming back to spawn in that cular river.

he dye studies have shown that the Nak- River follows a definite course in the Bay. n be recognized at least 12 miles out in nak Bay and probably farther. The route e river water will be matched with the n route of the salmon. It then can be mined if the distribution of the river wa- ontrols the salmon.

cientists would also like to answer the wing questions: Does the river water rol the distribution of the young fish going a? Does the river water follow certain ses through commercial fishing areas? , does it control the distribution of fish? hat extent is the distribution of river wa- massed, modified or mixed by winds and ms? This information is important in management of the commercial fisheries he State because the distribution of river ers may determine stocks of red salmon e commercial fishery and their destina- for particular rivers flowing into Bristol

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REIGN FISHING ACTIVITY ALASKA, JULY 1965:

.S.S.R.: A slight decline in the Soviet ling fleets in late June and early July followed by a moderate increase in trawl- bout the middle of July. Major Soviet ling efforts were still centered in the of Alaska throughout July. A small fleet o 8 trawlers supported by a few reefers ted off Southeast Alaska from near Cape aney to Cross Sound. Included in that was the small group of vessels which d off the Pacific Northwest Coast in

he area off Yakutat Bay once again in July became the center of Soviet trawl- A fleet of about 55 trawlers, 13 reefers, various support vessels were seen be- n Dry Bay and Icy Bay. Large quantities ean perch were observed on the decks any of the trawlers and processing ves-

ith the buildup of Soviet trawling off tat Bay, the fleet on Portlock Bank east

Fig. 1 - Soviet trawler hauling net containing Pacific ocean perch.

of Kodiak was reduced. By the end of July, the fleet on Portlock was estimated to include 20 trawlers, three reefers, and various support vessels.

The Soviet ocean perch fishery on Albatross Bank, which began with a small fleet in mid-June, was short lived and the area was abandoned by mid-July.

Fig. 2 - Soviet king crab factoryship Andrei Zakharov.

In the central and eastern Aleutians, generally near Seguam Pass, the Soviets maintained a sizable trawling fleet throughout July. That fleet averaged about 20 to 25 trawlers, including some 10 to 12 BMRT factory trawlers, accompanied by a few reefers and serviced intermittently by support vessels. Another smaller trawling fleet of about 10 trawlers, including several additional factory trawlers, was active in the western Aleutians throughout the month.

Indications in June were that the three Soviet king crab fleets would leave the Alaska area about July 1. Apparently those indications proved accurate for the Soviet crab

vessels were not sighted since the first day of July.

During early July the Soviets apparently abandoned their shrimp fishery, for all the SRT-M trawlers formerly fishing shrimp were located with ocean perch fleets. But in late July several of the SRT-M trawlers were again shrimping near Lighthouse Rocks east of the Shumagin Islands and it was estimated there then were about 5 SRT-M's and a reefer again engaged in the shrimp fishery.

Increased Soviet whaling activity was evident during July and it was believed there were three whaling fleets operating near Alaska. They were the factoryships Aleut, Dalniy Vostok, and Vladivostok, each accompanied by about 9 whale killers. Those fleets apparently worked mainly from the western Gulf of Alaska along the Aleutian Island Chain.

Japan: The Chichibu Maru and her fleet of 12 trawlers fishing for ocean perch and flatfish were not reported during July. But it was believed they were still operating in the western Aleutians or might have left the Alaska area. The two Japanese factory trawlers which during June had been fishing between the eastern Aleutians and the Pribilof Islands were not located in July and it appeared they had left the area.

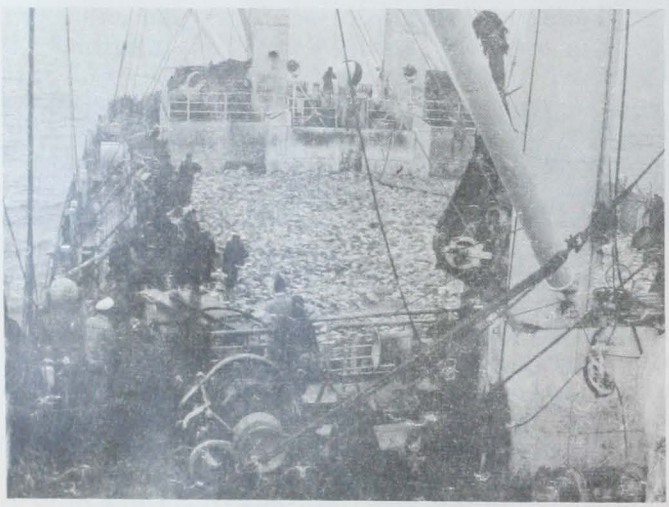

Fig. 3 - Japanese trawler in the Bering Sea with a deckload of flatfish.

Of the 23 vessels licensed by the Japanese Fisheries Agency to operate in the Gulf of Alaska fisheries in 1965, 10 had been in the area by the end of July. Those vessels, which consisted of 4 factory trawlers, 5 smaller catcher trawlers, and 1 processing reefer, fished mainly on Albatross and Portlock Banks near Kodiak taking primarily Pacific ocean perch.

Fig. 4 - Crab boats leaving Japanese king crab factoryship in Bering Sea.

The 3 Japanese fish-meal fleets operated throughout July roughly 100 miles northwest of the Pribilof Islands. Catches observed aboard the factoryships consisted of about 70 to 75 percent Alaska pollock, with the remainder mainly flounder and sole.

During July the factoryship Einen Maru and her 15 trawlers remained on the shrimping grounds just north of the Pribilof Islands.

Fig. 5 - A large catch of crabs on the deck of a Japanese king crab mothership.

Shortly after withdrawal of the Soviet king crab fleets in early July, the Japanese Tokei Maru fleet left the area east of the Pribilofs and returned to the more typical grounds on outer Bristol Bay. The Tokei and the Tainichi Maru fleets remained on the outer Bristol Bay grounds the entire month.

The 11 Japanese high-seas salmon fleets remained well west of the International Nort

Pacific Fisheries Convention (INPFC) salmon abstention line (175° W.) generally throughout July. Japanese sources reported the fleets were expected to reach their catch quotas by the end of July and return to Japan in early August.

All three Japanese whaling fleets were active off Alaska during July and ranged from near Dixon Entrance off Southeast Alaska to the western Aleutians.

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JAPANESE KING CRAB RESEARCH IN BERING SEA:

Biologists of the U. S. Bureau of Commercial Fisheries visited the Japanese research trawler Kumamoto Maru which in July was engaged in trawling and bottom sampling in the Bering Sea at over 100 locations on a grid. About 5,000 male crab caught at those locations were being tagged and released to study migration and growth, and obtain life history data. Size frequencies of the commercial catch also were being collected.

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JAPANESE CRAB CONSERVATION MEASURES:

It was noted that the Japanese Fisheries Agency inspector aboard the vessel Tainichi Maru favors good conservation and directed the fishing fleet to change fishing locations when the catch of female crab reached 20 percent of the catch. A special net designed for easy removal of crab is used when the catch of females falls below 20 percent of the total catch.

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SOVIET SCIENTISTS OBSERVE U.S. KING CRAB RESEARCH:

Soviet king crab biologists visited the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning on July 11. They observed the Bureau's king crab research and commercial fishing and processing activities in the Shumagin Islands area. During their visit, 2,459 king crab were tagged in study areas located off the Shumagin Islands and 3 crab-processing plants were visited to arrange for tag recoveries. An additional 370 crabs were sampled from commercial landings at Sand Point. The Soviets participated in the daily sampling work and during the visit, a mutual relationship developed between the Soviet and United States scientists, crew members, and fishermen and industry personnel. The Soviets also spent a day aboard the commercial fishing vessel Marine View.

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SALMON CAVIAR INDUSTRY DEVELOPING IN ALASKA:

For many years salmon roe has been considered an almost worthless byproduct of the salmon industry. The colorful pink or bright red eggs were usually discarded with the offal and dumped back into the sea. Within the last several years, however, salmon roe has received an increasing amount of attention--first as bait and more recently as salmon caviar.

In 1964, the production of salmon eggs for bait totaled about 1.5 million pounds with a wholesale value of over $300,000. Salmon caviar production was over 850,000 pounds with a wholesale value of approximately $750,000.

The new caviar industry has come about largely through the efforts of a Japanese firm which specializes in Alaska products for the Japanese market. The firm has set a production goal of 1,000 metric tons (2.2 million pounds) of salmon caviar for the 1965 season.

The price paid canneries for fresh salmon roe is 9 cents a pound, with the Japanese firm furnishing the labor for extracting the eggs. The firm has employed only Japanese nationals who have had extensive training in the caviar-making process. However, the firm has expressed interest in training native Alaskans to do the work. The training would extend over a period of about four seasons at which time the trainee would be considered skilled and would receive commensurate pay.

Alaska Fisheries Investigations

MIGRATION PATTERNS IN 1965 OF JUVENILE PINK SALMON:

A cruise during July 12-20, 1965, by the U. S. Bureau of Commercial Fisheries research vessels Heron and Blueboat observed and sampled juvenile pink and chum salmon

in all major summer schooling areas in Southeastern Alaska. Excellent weather conditions permitted additional observations around Cape Addington. Highlights included: (1) average fish size continued to be less than that observed in 1964, especially in the northern areas; (2) migrations to summer nurseries were later, especially in northern areas; (3) the largest pink salmon caught were found inside of Cape Muzon and may be of Canadian origin; (4) the largest summer nursery area observed so far in Southeastern Alaska includes most of Clarence Strait from Kasaan Bay to Snow Pass. Concentrations observed at Snow Pass indicated the beginning of a major migration by those fish into Summer Strait. Absence of juveniles around Cape Addington indicated a more northerly migration route for west coast of Prince of Wales Island pink and chum salmon to the Warren Island nursery area.

California

COD-END TRAWL TESTS AND HALIBUT-TAGGING PROJECT:

M/V "Alaska" Cruises 65-A-1 (February 24-March 5, 1965) and 65-A-4 (May 11-26): The objectives of these cruises by the California Department of Fish and Game research vessel Alaska on the Ventura Flats and Santa Barbara area were to: (1) compare fish retention in $5\frac{1}{2}$- and $7\frac{1}{2}$-inch mesh cod ends and 5- and $7\frac{1}{2}$-inch cod ends, (2) tag California halibut (Paralichthys californicus) longer than 500 millimeters (19.7 inches), and (3) collect supplemental age and growth information on larger fish.

All fish retained in the cod ends, except elasmobranchs, were measured. They consisted of 573 hornyhead turbot (Pleuronichthys verticalis), 442 English sole (Parophrys vetulus), 952 California halibut, and many less important species.

A well-defined selectivity of the various cod ends tested during the cruise showed that the calculated average weight of a 549 millimeter (21.6 inches) fish is 3.77 pounds which represents an undersized fish that cannot be marketed legally. The 297 California halibut longer than 500 millimeters that were tagged on the cruise averaged $6\frac{1}{2}$ pounds each. Age and growth information was collected from 163 large fish up to 45 pounds.

A scientist from the "Institut für Film and Bild," Munich, Germany, who accompanied the cruise, exposed 1,200 feet of 16-mm. color film on trawling activities during the cruise.

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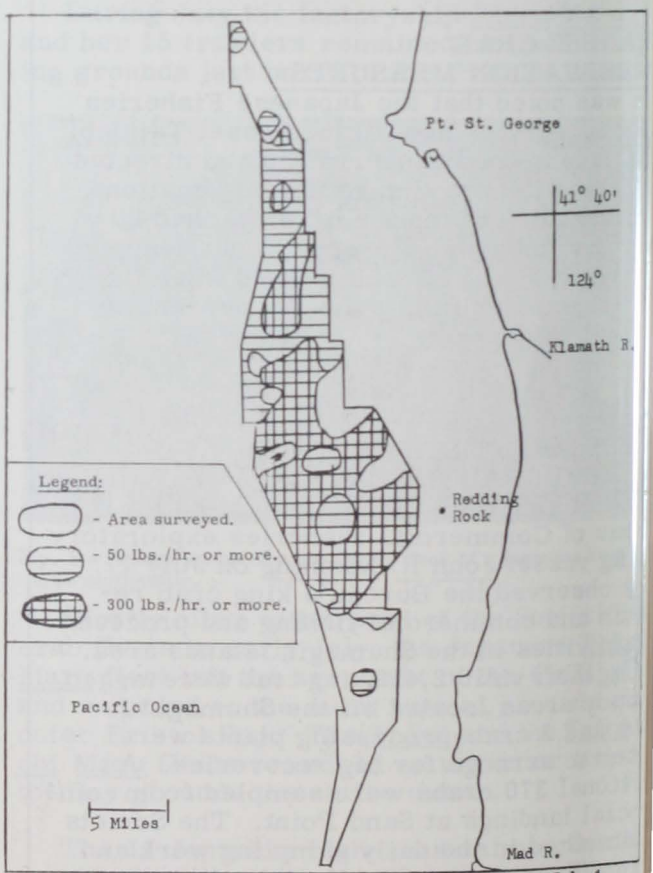
SURVEY OF SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "Alaska" Cruise 65-A-5-Shrimp (June 1-July 1, 1965): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters from the Oregon border to Eureka, Calif., were to: (1) sample randomly concentrations of pink shrimp (Pandalus jordani) for determining population estimates and natural mortality rates; (2) determine sizes, sex, and weight of shrimp; (3) save all rare or unusual invertebrates and fish for various collections and the State Fisheries Laboratory at Terminal Island; and (4) collect stomachs from Pacific hake (Merluccius productus) and arrowtooth halibut (Atheresthes stomias) for relative abundance studies of juvenile shrimp.



M/V Alaska Cruise 65-A-5-Shrimp (Area A), June 1-July 1, 1965.

hree sets of 39 tows were completed on the cruise. The tows from each set were randomly distributed over the 270-square-mile survey area between the mouth of Mad River and the Oregon border. The average distance of each tow was ½ mile, thus covering an area of 75,950 square feet (assuming a net opening of 25 feet). The same net was used as on the March-April 1965 survey by the vessel Alaska--a semiballoon, Gulf of Mexico shrimp trawl with 41-foot headrope and 1-inch stretched mesh. A ½-inch stretched mesh liner was used in the cod end to prevent 1-year-old shrimp from escaping. Fishing depths ranged from 40 to 100 fathoms.

The 270-square-mile survey area covered consisted of 190 square miles where 50 pounds or more per hour of shrimp could be taken. It was found that 300 pounds or more an hour (commercial concentration) could be taken in an area of 121 square miles. Average catch per hour (excluding yields under 36 pounds per hour) was 390 pounds and ranged from 36 to 836 pounds. It was estimated that 5.7 million pounds of shrimp remain on the bed. The shrimp count (heads-on) per pound ranged from 70 to 205, with a mean of 166 to the pound.

Several unusual cephalopods and fish caught during the cruise were sent to the California State Fisheries Laboratory for identification. A total of 83 arrowtooth halibut and 51 hake stomachs were collected and preserved for examination in the laboratory.

[1] See Commercial Fisheries Review, August 1965 p. 26.

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SURVEY OF CRAB RESOURCES IN COASTAL WATERS CONTINUED:

M/V "Nautilus" Cruise Report 65-N-2A-F (January 14-20, February 10-15, March 29-April 3, April 12-17, May 11-17, June 24-30, 1965): To determine if a reduced male population of dungeness or market crab (Cancer magister) is adequate to maintain the resource was the main objective of these trips. Another objective was to determine the distribution and abundance of crab larvae. The waters of central California from Point Reyes to Pedro Point were surveyed for this purpose by the research vessel Nautilus, operated by the California Department of Fish and Game.

Eight plankton stations were visited by the research vessel during each of the 6 cruises from Point Reyes to Pedro Point. At each station, 10-minute plankton tows were made at the surface and at a depth of 10 meters (32.8 feet). The plankton was preserved in formalin for further examination. Commercial-type traps were set at selected stations to obtain male and female crabs to examine for evidence of mating. Limited trawling was conducted at stations from San Francisco to Drakes Bay.

Plankton taken on the cruise has not been analyzed completely, but preliminary examination showed crab larvae were abundant from January through March, and decreased in abundance from April to June. A few megalops of Cancer magister taken on April 14 at Drakes Bay were held in a laboratory aquarium. They molted into the first crab instar on April 30. This is the earliest the first crab instar has been noted in central California. Megalops of C. gracilis and C. productus, also taken during this study, molted into first crab instars April 20. Sea surface temperatures were lowest in May when they ranged from 9.4° C. (49° F.) at one station covered to 11.4° C. (52.6° F.) at another station near San Francisco Bay. Temperatures were highest in June, ranging from 11.6° to 13.2° C. (52.8° to 55.8° F.) in the same areas, respectively.

Female market crabs were examined for evidence of fertilization and to determine if they had carried eggs. In January, 75 percent of the females had carried or were still carrying eggs. Some mating activity was indicated by fresh mating marks on chelipods of a few male crabs. In February, more mating activity was evident--28 percent of the males had mating marks and 3 soft females were taken.

During the last of March, 71 percent of the males bore mating marks, and 13 percent of the females were soft. A total of 71 females were dissected and their spermatheca examined. In 93 percent, the spermatheca was full and white; 7 percent had spermatheca which were hard or empty, or contained a hard red plug which may have resulted from incomplete shedding of the eggs.

The April 12-17 cruise revealed 77 percent of the males had mating marks and 31 percent of the females were soft. Dissection of 40 females showed 92 percent with full white spermatheca and 8 percent empty. Ovary color ranged from white to red-orange.

Soft females generally had white ovaries, while the color changed to orange as the shell hardened.

During May, only 68 percent of the males had mating marks; the percentage drop was a direct result of molting. About 22 percent were soft and 10 percent were hard, and there was no evidence of mating among those. Of 60 females examined for evidence of fertilization, 55 had full white spermatheca, 3 had hard spermatheca, 1 had a hard red plug, and 1 immature female 4.1 inches long had not been fertilized.

In late June, 52 percent of the males were soft and mating had almost stopped. Twenty females then examined for evidence of fertilization had full spermatheca.

Note: See Commercial Fisheries Review, April 1965 p. 17.

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SAN FRANCISCO BAY INVESTIGATIONS CONTINUED:

M/V "Nautilus" Cruises 65-N-1A-C-D-E-F-San Francisco Bay Study (January 8-13, March 23-27, April 19-23, May 5-9, June 20-23, 1965): Studies in San Francisco Bay (south of San Pablo Bay) were resumed with these cruises by the research vessel Nautilus of the California Department of Fish and Game. Objectives were to: (1) collect fish and invertebrates routinely at six stations; (2) determine distribution and relative abundance under prevailing environmental conditions; (3) define ecological zones of the bay; and (4) determine the food organisms of the principal species and their availability.

The six stations worked in the Bay study area had an average depth ranging from 15 to 50 feet. Station locations were: $\frac{1}{2}$ mile southeast of Redrock; $\frac{1}{4}$ mile east of middle of east side of Treasure Island; $\frac{1}{4}$ mile west of middle of west side of Treasure Island; $\frac{1}{4}$ mile west of radar pylon on San Bruno shoal; $\frac{1}{2}$ mile north of red buoy at entrance to channel to Redwood City Harbor; and $\frac{1}{4}$ mile east of Dumbarton railroad bridge.

During the cruise a square-mouthed midwater trawl 25 feet on a side was towed for 20 minutes at the surface. Each station was also sampled by a 20-minute bottom tow with a 15-foot otter trawl having 1-inch mesh. Six special additional otter trawl tows were made just north of the Richmond-San Rafael Bridge on May 9; two more tows were made in the same location on June 23.

Fish caught during the cruise were identical to those previously taken in the San Francisco Bay Study, except for three which were new to the study. The new species were boccacio (Sebastodes paucipinis), carp (Cyprinnus carpio), and white sturgeon (Acipenser transmontanus). The addition of these 3 species brought the total of species taken in the study to 67.

Water samples for temperature and salinity determination were taken at the surface and bottom at the first 5 stations covered, and at the surface at the sixth which was in shallow water. Temperatures were almost the same as for the same months in 1963 and 1964. Salinities were very similar to those in 1963; in 1964 they were consistently higher.

Note: See Commercial Fisheries Review, April 1965 p. 18.

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COMMERCIAL SHRIMP FISHING AREA CLOSED FOR SEASON:

The closure of commercial shrimp fishing in Area A off the coast of northern California was announced July 27, 1965, by the California Department of Fish and Game, and became effective at midnight July 31.

Under a State law which gives the Department of Fish and Game authority to protect the shrimp resource, the ocean area is ordered closed to shrimp fishing when the annual quota established by the Fish and Game Commission has been reached. The quota for 1965 was set at 1 million pounds. Shrimp Permit Area A extends from the California-Oregon border south to False Cape.

Under a cooperative arrangement with California, the State of Oregon also orders its commercial shrimp fishermen out of the area for the remainder of the year. (California Department of Fish and Game, July 27, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 1

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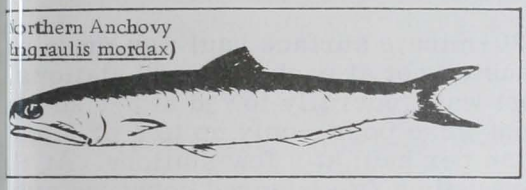
PLAN SOUGHT FOR SCIENTIFIC MANAGEMENT OF ANCHOVY RESOURCE:

The California Department of Fish and Game has been instructed by its Commissio to prepare a proposal for scientific management of the anchovy resource in waters off the California coast. This action is in accordance with Governor Brown's statement

wh e pocket vetoed a bill that would have all d commercial fishing for anchovies for duction into poultry feed and other products. The Governor said in his veto message he eved management of the anchovy resource, issuance of permits for reduction, and trol of the harvest could best be accomplished under jurisdiction of the Fish and Game Commission. The Governor said this would allow flexibility in the scientific management of the anchovy resource and would permit immediate closing of the fishery for reduction if at any time the resource should be threatened.



e Commission instructed the Department of Fish and Game to present a proposal for managing the anchovy resource for discussion at the Commission's meeting which was to be held in San Francisco on August 27, 65. The Commissioner said, "Governor Brown's veto of the anchovy bill has opened the way to long-range, scientific management of the anchovy resource. Members of the Commission are aware of the will of the legislature and the views of the Governor on this matter, and we are confident the Department of Fish and Game will present a workable scientific plan which will provide for appropriate harvesting of anchovies and at the same time will afford long-term protection of this important ocean fisheries resource."

e Commission planned to meet in Los Angeles on October 1 to give formal consideration to proposed anchovy fishing regulations developed by the California Department of Fish and Game. (The proposed regulations were developed in lieu of Assembly Bill 156, which failed to become law.) At the October 1 meeting, statements were to be received from interested persons, after which final anchovy regulations would be adopted. (California Department of Fish and Game, July 27 and August 21, 1965.)

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MARINE SPORT FISH SURVEY OFF SOUTHERN CALIFORNIA CONTINUED:

Airplane Survey Flight 65-8 (July 10, 1965): This was the second in a series of aerial flights conducted by the California Department of Fish and Game to make instantaneous counts of poles and fishermen along the coast. For that purpose, the southern California coastline from the Mexican Border to Jalama Beach State Park was surveyed from the air by the Department's aircraft Cessna "182" N9042T. The counts taken will eventually be used in estimating shore fishing effort in southern California during 1965.

On this flight, the California coastline was surveyed from south to north between the hours of 11:00 a.m. to 3:20 p.m. with a 1-hour stop at Goleta. A hazy overcast did not interfere with making accurate observations.

A total of 282 poles attended by 274 fishermen was counted. A total of 58 or 21 percent of the fishermen were in areas (mainly military and private) not included in the regular shoreline sampling. Greatest concentrations of fishermen were noted between Leucadia and south Laguna Beach, north Huntington Beach to the Long Beach Rainbow Pier, and Topanga Beach to Mandalay Beach. Those three areas contained over 62 percent of all fishermen counted.

The flight indicated considerable effort in private and simiclosed areas, and emphasized the need for at least bimonthly flights in order to measure that effort.

Airplane Survey Flight 65-9 (July 27, 1965): The same coastline area as on the July 10 flight was surveyed during this flight by the Cessna "182" N9042T.

The weather was generally clear throughout the surveyed area. The bright sunlight was reduced (or intensified) by various amounts of haze, smog, or a combination of both. A moderate northwest breeze began blowing late in the morning and increased in intensity by midafternoon, with sufficient strength to create whitecaps.

The survey began at 9:45 a.m. at the Mexican Border and progressed northwestward along the shoreline to Goleta Beach Park. Goleta Beach Park to Jalama Beach State Park was covered in 25 minutes flying time shortly after noon. The entire survey was made from an altitude of 500 feet.

The count on this flight was 119 fishing poles. It was not practical to count the people attending the poles because of the large

number of bathers and onlookers, and the altitude of the plane. Small groups of fishermen (e.g. poles), numbering up to 3 or 4, were well spread out along the entire coast except for a concentration of 37 poles near the Mandalay Steam Plant (between Port Hueneme and Ventura).

Three broad areas were observed to be infested with a well developed "red tide"; from Seal Beach south of Laguna Beach, Santa Monica Bay (a relatively narrow band paralleling the shoreline), and Ventura to Port Hueneme. Areas west of Ventura were relatively free of red tide, with pockets of crystal-clear water. Los Angeles-Long Beach harbor had its usual murky color with an intense spot of red near Belmont Shore Pier.

Note: See Commercial Fisheries Review, August 1965 p. 27.

Cans--Shipments for Fishery Products, January-June 1965

A total of 1,452,157 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-June 1965 as compared with 1,347,894 base boxes used during the same period in 1964. It is believed that somewhat larger shipments to the Pacific or Western Area (principally for salmon and tuna) and also to the Eastern Area (for the Maine sardine packing season) accounted for the increase in 1965.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.

Central Pacific Fisheries Investigations

EQUIPMENT TESTED FOR SAMPLING TUNA LARVAE:

M/V "Charles H. Gilbert" Cruise 83 (June 7-24, 1965): To make a series of surface hauls with both plankton and neuston nets in order to determine their effectiveness for sampling tuna larvae and juveniles was the primary objective of the cruise. The leeward waters off the island of Oahu was the area covered by the research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

During the cruise, simultaneous 1- and 2-meter (3.3 and 6.6 feet) net hauls were made at 68 stations worked by the vessel. Four hauls at various intervals were made each night for 17 nights. The 2-meter net caught more tuna larvae than the 1-meter net, but the catch ratio between the two nets was closer to 2:1, rather than the 4:1 ratio expected on the basis of volume of water strained. The 2-meter net performed satisfactorily in deep oblique tows.

A 20-minute surface haul was made with the neuston net at each of the 68 stations. The net was generally towed at 5-6 knots. Catches were poor--only up to 5 or 6 juvenile fish per haul at a few stations. At most stations only a few hundred copepods and other invertebrates were taken. The largest fish taken was a 15-inch long half-beak (Hemiramphidae). No tuna was taken.

A total of 24 skipjack tuna, 17 yellowfin, and 14 "albacore" (Ueyanagi's description) eye lenses were collected from plankton samples and dry-frozen during the cruise. Other operations included the release of drift cards and collection of bathythermograph (BT) data.

Brignt moonlight throughout the cruise period reduced the catches of larval tuna considerably. Hauls made in darkness prior to moonrise or after moonset yielded better catches than those made when the moon was high. Very few birds were seen in the area, several bird flocks were seen on two occasions near the end of the cruise.

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SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 84 (July 12-16, 1965): The collection of live mackerel-like (scombrids) species for behavior studies was one of the main objectives of this cruise by the research vessel Charles H. Gilbert, operated by the U.S. Bureau of Commercial Fisheries Biological Laboratory Honolulu, Hawaii. The area covered was south of Oahu between Mokuumanu and Kaena Pt., and not more than 20 miles from shore.

Other objectives of the cruise were to: (1) collect tuna specimens for density deter-

mi ions, (2) determine weight lost from m m and large skipjack tuna after removal head and viscera, (3) take photographs of hing operations, and (4) collect water sa les for bacteriological study.

ught during the cruise and returned live to Bureau's facility at Kewalo Basin were 100 ipjack tuna, 7 frigate mackerel, 1 little tu and 1 yellowfin.

hing operations were photographed as pl d, water samples were obtained, and th ual standard watch for fish, birds, and aq c mammals was maintained. Thermogr and barograph equipment was operated co uously.

ll lines were kept out continuously during cruise between Kewalo Basin and each fis g station covered; total trolling time wa hours and 50 minutes. Two mahimahi (C phaena hippurus), better known as dolphi were caught.

Note: See Commercial Fisheries Review, September 1965 p. 20.

* * * * *

RE LTS OF PLANKTON NET TI S IN HAWAIIAN WATERS:

obably the most elusive fish in the sea ar ose from a few days to a few weeks old. Th do not appear in the commercial catch (e t in the stomachs of other fish) and of re able to swim fast enough to dodge th s that marine biologists use to collect th nkton, the drifting plants and animals of ocean. Specimens of the larval fish ar sential in the study of many fishery pr ms.

e net commonly used to collect plankto one meter (39.4 inches) in diameter at its th. It has been suggested that a net wi larger mouth opening might be able to ca more of the larval fish, which would ha rther to swim to escape the oncoming ne

ently, a biologist at the U. S. Bureau of mmercial Fisheries Biological Laboratory Honolulu, Hawaii, designed and constr ed a square net 2 meters to the side and wed it and a standard 1-meter net simu eously, the 2-meter net on the starboa side, the 1-meter net on the port side of Laboratory's research vessel Charles H bert (Cruise 83, June 7-24, 1965). Both ne e re weighted to keep them just below the surface of the water. Towing speed, usually about 3 knots when the 1-meter net alone is used, had to be restricted to about 2 knots to keep the larger net from breaking the surface.

Fig. 1 - A standard plankton-collecting net with 1-meter mouth opening.

Four hauls were made each night for 17 consecutive nights on the lee side of the island of Oahu (on which Honolulu is located) and in waters fished by the commercial fishing fleet for skipjack tuna, the predominant species in the Hawaiian commercial fish catch.

Fig. 2 - A plankton net with 2-meter opening to the side (designed by a U.S. Bureau of Commercial Fisheries biologist).

Both skipjack and yellowfin tuna larvae were taken, the skipjack being many times more plentiful. The larger net caught more of the larger larvae, about a quarter of an inch long, than did the 1-meter net. The Bureau biologist who designed the larger net said that it may have been possible for more of the larger larvae to dodge the 1-meter net. Although the 2-meter net caught nearly twice the number of tuna larvae that the 1-meter net did, on the theoretical basis of volume of water strained, the catches fell short of the expected 5 to 1 ratio. (Being 2 meters square, the larger net has a mouth area 5 times that of the 1-meter net.)

There were two circumstances bearing on that cruise by the Laboratory's research vessel that had particularly interesting implications for research on larval tuna. Bright moonlight prevailed throughout the cruise period. When a tow was made in complete darkness prior to moonrise or after moonset, or when the moon was low, the larval catches were good. During such periods, the 2-meter net caught from 16 to 61 larvae in each tow. When the moon was bright, catches were poor, from no larvae at all to 9 a tow. When the moon was obscured by cloud cover for some time before the tow, the catch would be similar to that made in darkness.

The other circumstance related to the distribution of the skipjack tuna fishery. When Cruise 83 began, fishing had been good on the lee side of Oahu. Shortly afterward, the fishery moved southeastward toward the island of Hawaii, following the adult skipjack. For a week and a half the vessel made good larvae catches in the lee of Oahu, apparently collecting larvae that had been spawned there before the adults left the area. Then in a matter of a day or two, larval catches dropped to almost nothing.

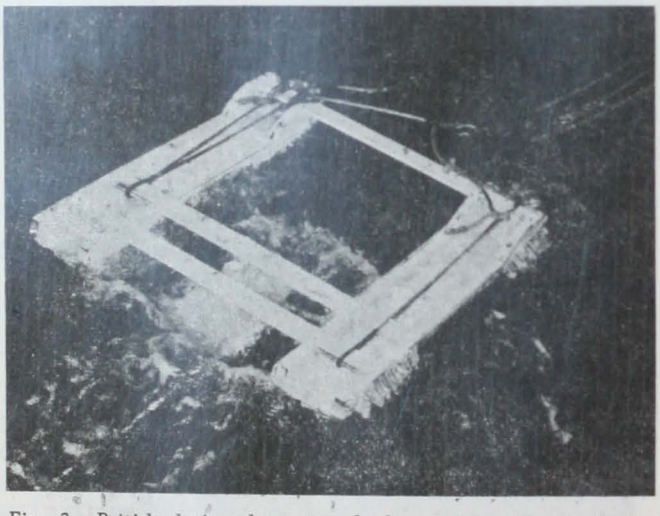

Fig. 3 - British-designed neuston plankton net (small net attached to floats on either side).

Fig. 4 - Plankton samples being analyzed at sea.

A second mission of the Charles H. Gilbert cruise was to test the British neuston net, a small net attached to a sled pulled rapidly through the water. It is designed to catch sea animals in the surface layer (the neuston). In the Arabian Sea, where it was first used, a 15-minute tow yielded over 1,000 young frigate mackerel (a small tunalike fish) measuring from $\frac{5}{8}$-inch to $1\frac{1}{2}$ inches long, a size very difficult to capture by conventional techniques. Off Oahu, it was towed for 20 minutes at each of the 68 stations covered at a speed of about 5 knots. Catches were extremely poor. This may have been due to the prevailing moonlight, the Bureau's biologist said.

* * * * *

SUBMARINE STUDIES OFF HAWAII:

The 2-man submarine Asherah was scheduled to arrive in Hawaii on September 11, 1965, to spend a month making research dives for the U. S. Bureau of Commercial

Fisheries Biological Laboratory in Honolulu. It has called for the craft to work a 6-day week, making daily dives in the vicinity of Weber's Point, after being towed to sea by the Honolulu Laboratory's research vessel Townsend Cromwell. During operations at Weber's Point, the Asherah was to dock at the Nenue, a 12-foot-square raft anchored in water 1,000 to 1,500 feet deep.

The Asherah is 16 feet long. Battery powered, she is capable of a speed of 4 knots submerged. Pilot and observer sit in bucket seats in a 6-windowed sphere 5 feet in diameter. The Asherah is completely maneuverable in all directions. It may power itself to the surface, to the bottom, or hover. It is equipped with an underwater telephone to maintain continuous contact with surface facilities. Its maximum operating depth is 600 ft. There are two motors, one mounted on each side.

A series of research projects bearing on the commercial potential of Hawaiian waters have been planned for the submarine. One investigation will consist of a survey of the fishery potential of the bottom area. The rocky bottom off the Hawaiian coast has been little studied. The Asherah offers scientists their first opportunity to make direct observations of the creatures that live there. Some of those might have commercial potentials.

In another study, long-line fishing gear will be set out by the Townsend Cromwell and observed by the submarine. In long-lining, hooks are attached to drop lines which hang from the long-line. It is a method used by a part of the Hawaiian fleet and with great success by Japanese fishermen.

No one before has had the chance to observe what actually is happening at the long-line hooks several hundred feet below the surface. Scientists are particularly interested in whether the fish approach the hooks in schools or whether they are dispersed. The question is one of more than academic interest--if the fish are in schools, perhaps new and more efficient methods could be developed to catch them in commercial quantities.

In a related study, a series of large objects (10-foot discs) will be attached at 100-foot intervals to the Nenue's anchor chain. It is known that fish gather about floating objects at sea. It is also known that they gather around large objects on the sea bottom. Now it will be possible to see if the 10-foot discs act as "fish collectors" in the intervening layers of the sea.

Other studies are aimed at understanding the forage or food of tuna. This consists of the small animals that make up the plankton and the larger animals, such as fish and squid, which feed upon plankton. Plankton is known to rise to the surface at night and descend during the day. Sometimes there are clouds of plankton so thick that it reflects underwater sound, a phenomenon that puzzled the U. S. Navy during World War II. There have been few opportunities for scientists to observe these "deep scattering layers" directly. A planktologist will make several dives to investigate the phenomenon, and another scientist will observe the fish associated with the plankton layers.

Another investigation will find the Townsend Cromwell towing standard plankton collecting nets while the Asherah follows to allow observations of the behavior of fish and other creatures as the net approaches.

In another study, the attenuation of light beneath the sea surface will be measured.

Oceanographic studies will include observations on oceanic fronts. The Asherah will also be used as a "drift bottle" by letting it drift at different depths and then surface to determine the distance traversed.

Scientists from the University of Hawaii also planned studies with the Asherah.

Note: See Commercial Fisheries Review, Aug. 1965 p. 50.

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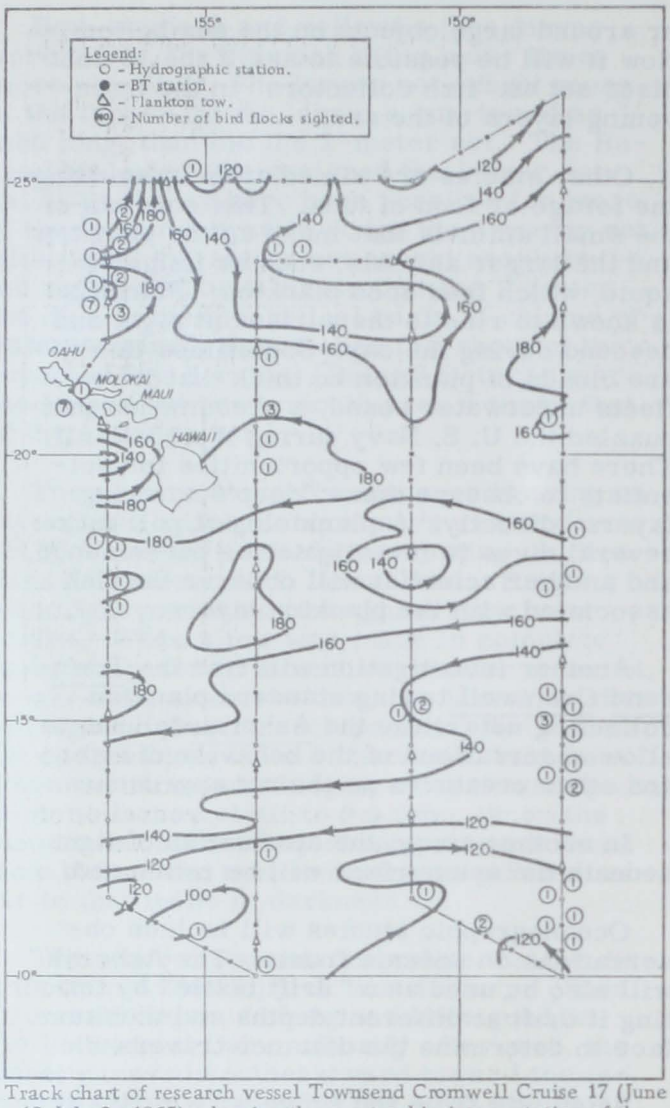
FINAL CRUISE COMPLETES FIRST PHASE OF TRADE WIND ZONE OCEANOGRAPHIC RESEARCH PROJECT:

M/V "Townsend Cromwell Cruise 17 (June 10-July 2, 1965): This was the last in a series of oceanographic cruises to determine rates of change in the distribution of properties in the trade wind zone of the central North Pacific (latitude 10° N., 27° N. and longitude 148° W., 158° W.). A total of 43 oceanographic stations was occupied by the U. S. Bureau of Commercial Fisheries research vessel Townsend Cromwell along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at various depths, and several deep



Track chart of research vessel Townsend Cromwell Cruise 17 (June 10-July 2, 1965), showing the geostrophic interpretation of the 20° isotherm.

casts ranging up to 5,000 meters (16,404 feet) were taken at designated stations.

The overall circulation pattern for June was similar to that observed in May 1965 (Cruise 16). But there were a few noticeable changes in the system of eddies and the directions of the flow lines. The large clockwise circulation seen during the previous month around the Islands had since broken down into a number of smaller systems. A relatively intense counterclockwise eddy had appeared just west of Hawaii. A similar eddy seen in May at 19° N., 148° W., appeared to have moved westward. To the north of the Islands, the generally eastward flow had begun to curve back to the north and northwest, forming a large counterclockwise flow. South of the Islands, the westerly flow seemed to be moving at about the same intensity as during May, as judged by the slopes of the isotherms.

A slight cooling of the surface waters was seen in the northeastern sector of the study area, where temperatures of less th 23.0° C. (73.4° F.) were registered. Duri May, the lowest temperatures were about 23.5° C. (74.3° F.). In the southern sectio however, the 26.5° C. (79.7° F.) isotherm had moved northward.

A total of 69 bird flocks was sighted on the cruise as compared with 62 during the May cruise. A large number of those floc were seen in the southeast sector in contrast to the May distribution.

Other operations during the cruise included the usual series of bathythermogra and surface plankton tows, the use of a Hytech in situ salinity-temperature-depth recorder, release of drift bottles, and collection of other oceanographic data.

Note: See Commercial Fisheries Review, September 1965 p.

Columbia River

SALMON FISHERY REOPENED BELOW BONNEVILLE DAM:

Commercial fishing for salmon in the Columbia River was resumed July 29, 19 in Area 1 (between the mouth of the river and a point 5 miles downstream from Bon ville Dam). The commercial fishery in t area was scheduled to continue (with wee end closures) until August 25, 1965.

The Columbia River below Bonneville Dam was also reopened to sport salmon fi ing on July 29, 1965, but the ban on sport fishing above Bonneville Dam was to con tinue until August 20, 1965.

The Columbia River had been entirely closed to salmon fishing since late June 1 The opening below Bonneville Dam was de signed to harvest the early fall chinook a coho salmon runs in the river. (Washing State Department of Fisheries, July 28, 1

Note: See Commercial Fisheries Review, Aug. 1965 p. 33.

Crab Meat

PLASTIC CONTAINER APPROVED BY MARYLAND:

A plastic container for use in packing fresh-picked pasteurized crab meat has been approved by the Maryland State Health Department. The plastic container when proposed used provides an overall product protection equal to the metal cans now in use, according to tests made by the University of Maryland's Seafood Processing Laboratory at Crisfield, Md.

Announcing approval of the plastic container on July 7, 1965, a Maryland State Health official said, "if pasteurized at the recommended temperature of 185° F. for 110 minutes and refrigerated properly, there is no reason why crab meat can not be marketed in these packages which have an obvious added consumer appeal." Industry representatives were cautioned, however, that those using the new plastic containers must follow the pasteurization process worked out by the Seafood Processing Laboratory. Industry members were also urged to visit the Laboratory and observe the correct method of sealing plastic cans.

The technician in charge of the Laboratory tests of the new container said, "there was no significant difference in taste or appearance between the meat stored in the metal and the plastic containers for the first 4 months of storage, but after this period our taste panel definitely preferred the crab meat stored in plastic. There was no significant difference in the texture of the meat during the entire 6 months storage cycle we had set for the tests." (Natural Resources Institute, University of Maryland, College Park, Md.)

Fish Sticks and Portions

U. S. PRODUCTION, APRIL-JUNE 1965:

United States production of fish sticks and fish portions amounted to 51.0 million pounds during the second quarter of 1965, according to preliminary data. Compared with the same quarter of 1964, this was an increase of 12.1 million pounds or 31.2 percent. Fish portions (32.5 million pounds) were up 9.4 million pounds or 40.6 percent, and fish sticks (18.5 million pounds) were up 17.4 percent.

Table 1 - U. S. Production of Fish Sticks by Months and Type, April-June 1965 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
April	6,051	286	6,337
May	5,041	356	5,397
June	6,513	250	6,763
Total 2nd Qtr. 1965 1/	17,605	892	18,497
Total 2nd Qtr. 1964 2/	14,419	1,330	15,749
Total 1964 2/	67,810	5,722	73,532

1/Preliminary.
2/Revised.

Table 2 - U. S. Production of Fish Portions by Months and Type, April-June 1965 1/

Month	Breaded			Unbreaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.)				
April	2,260	8,190	10,450	196	10,646
May	1,725	8,602	10,327	233	10,560
June	1,648	9,498	11,146	179	11,325
Tot. 2nd Qtr. 1965 1/	5,633	26,290	31,923	608	32,531
Tot. 2nd Qtr. 1964 2/	4,891	17,807	22,698	442	23,140
Total 1964 2/	20,956	82,135	103,091	2,541	105,632

1/Preliminary.
2/Revised.

Cooked fish sticks (17.6 million pounds) made up 95.2 percent of the April-June 1965 fish stick total. There were 11.1 million pounds of breaded fish portions produced, of which 9.5 million pounds were raw. Unbreaded fish portions amounted to 179,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 14.1 and 20.0 million pounds, respectively. The Inland and Gulf States ranked second with 11.8 million pounds of fish portions. The Pacific States ranked second with 2.3 million pounds of fish sticks.

Great Lakes

LAKE TROUT REHABILITATION PROGRAM:

Projects that are under way to revitalize the lake trout fishery in the Great Lakes include: (1) initial restocking of that species in Lake Michigan, (2) completion of the first round of lampricide treatment of that lake's tributary streams, and (3) substantial additional plantings of young lake trout in Lake Superior.

During summer 1965 more than 1.2 million yearling lake trout were set free in northern Lake Michigan where sea lamprey are

expected to be substantially reduced by 1967. Due to their small size, the lake trout are expected to be safe from attacks by the predators during the next two years. Chemical treatment of Lake Michigan's lamprey-spawning streams was started in 1960, and all 99 streams will have had at least one application of lampricide by spring 1966.

Another step in the lake trout rehabilitation program calls for closing Lake Michigan to commercial fishing for that species in order to protect the hatchery lake trout planted in the lake. The State of Michigan Department of Conservation scheduled public hearings this past July to consider a proposal to adopt a regulation for that purpose effective October 1, 1965. Wisconsin was expected to impose a similar measure for its Lake Michigan waters.

In Lake Superior, more than 1.8 million young lake trout were to be planted during summer 1965, bringing the total in this restoration project to nearly 12 million fish. Of the total number of young lake trout to be released in 1965, about 1.3 million will be in United States waters and about 500,000 in the Ontario section of Lake Superior. (Great Lakes News Letter, May-June 1965.)

Note: See Commercial Fisheries Review, August 1965 p. 37.

Great Lakes Fisheries Explorations and Gear Development

LAKE HURON TRAWLING STUDIES:

M/V "Kaho" Cruise 27 (July 14-August 4, 1965): This 21-day cruise in Lake Huron and Saginaw Bay was the first in a series of cruises to explore the potential of developing more effective and efficient methods for catching and handling fish stocks in Lake Huron.

The primary objectives of the cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho were to determine the location, bathymetric distribution, abundance and seasonal availability of various species of fish to bottom trawls, and to locate areas suitable for bottom trawling. Since yellow perch were not taken in Saginaw Bay in the amounts expected, the cod-end mesh size selectivity study planned for that species was cancelled and the time used to extend explorations into a larger segment of Lake Huron than was originally intended. Other activities included collecting fish and bottom samples for botulism and limnological investigations.

Trawl fishing in the Saginaw Bay area of Lake Huron revealed alewife and carp populations of sufficient size to support a high-volume fishery that could produce raw material for the manufacture of pet food, mink food, or fish meal. Further seasonal assessments are needed, however, to verify the true potential for such a fishery. A total of 24 out of 31 half-hour drags in that area yielded catches ranging from 250 to 1,650 pounds, and averaging 610 pounds. Catch rates of 250 pounds or more with the relatively small standard sampling net used for explorations are considered of commercial significance even for low-value species. The total catch of 21,010 pounds was composed of 86 percent alewife, 5.5 percent carp, 5 percent smelt, 2 percent chub, and 1.5 percent other species.

FISHING OPERATIONS: A total of 84 drags was made during the cruise--31 in Saginaw Bay and 53 in the open lake. All drags were made with a standard 52-foot (headrope) Gulf of Mexico-type fish trawl, each lasting 30 minutes except for 11 drags which were ended early due to snags, rough bottom conditions, or set fishing gear. Gear damage occurred on 12 drags. The damage was only minor on 4 of them, but major net damage or loss occurred during the other 8 drags. The incidence of gear damage was much greater from Harrisville north, where 1 out of 3 drags resulted in gear damage. The rate of gear damage south of Harrisville was only 1 out of 18 drags.

FISHING RESULTS (Saginaw Bay): The results of fishing in Saginaw Bay indicate a large abundance of alewife which accounted for 90 percent of the catch. Carp made up 8 percent and smelt 1.5 percent. Only 47 pounds of yellow perch were landed during the entire cruise.

The average catch rate for all species in Saginaw Bay each half hour was 521 pounds, 467 pounds of which were alewife. The best individual catches of alewife (1,000 and 1,6 pounds) were taken in 12-15 fathoms in mi bay between Tawas City and Huron City. T best catch of carp was 400 pounds taken in 4 fathoms off Pt. Au Gres; and the best sm catch was 98 pounds taken in 17 fathoms N

...ort Austin. Other species were caught ...mall amounts only. Species other than ...ife, carp, yellow perch, smelt, and chub ...ginaw Bay trawl catches included small ...nts of catfish, sucker, spottail shiner, ... few pounds of common whitefish and ...-perch.

...SHING RESULTS (Lake Huron): With ...ception of good catches of 700, 900, and ... pounds of alewife taken off Oscoda and ... City, catches of all species were very ...n the open lake. The average catch for ...half-hour drag in Lake Huron was only ...ounds, of which 97 pounds were alewife. ...species composition for all drags in the ...lake was: alewife 79 percent, smelt 13 ...ent, and chub 6 percent. Other species ...amounted to only 2 percent of the catch. ...highest catch rate of alewife during the ...e was at 15 fathoms off Huron City where ...-minute drag yielded 900 pounds--a half-...catch rate of 2,700 pounds.

...f Harbor Beach and Port Hope, catches ... very light with the best consisting of ... pounds. North of Harrisville, catches ... also very light and averaged only 82 ...ds a drag. Two-thirds of the total quan-...anded in the northern end of the lake (... than a ton) were alewife. The best catch ...ewife in northern Lake Huron was 300 ...ds taken in St. Martins Bay. The best ... catch of the cruise was 100 pounds tak-... 25 fathoms off Harrisville, and the best ... of chubs (mostly bloaters) was 80 pounds ... in 35 fathoms off Alpena.

...ecies other than alewife, chub, and smelt ... open Lake Huron trawl catches included ...eback (68 pounds), sculpin (24 pounds), ... whitefish (16 pounds), common white-...5 pounds), long-nose sucker (16 pounds), ...ery small amounts of several other spe-...

...DROGRAPHIC DATA: During the cruise, ...al gradients were recorded using a ...thermograph and continuous surface ...erature recorder. Bottom temperatures ...ed from 41° to 70° F. and surface tem-...tures ranged from 42° to 70° F.

See Commercial Fisheries Review, Sept. 1965 p. 28.

Gulf Fisheries Explorations and Gear Development

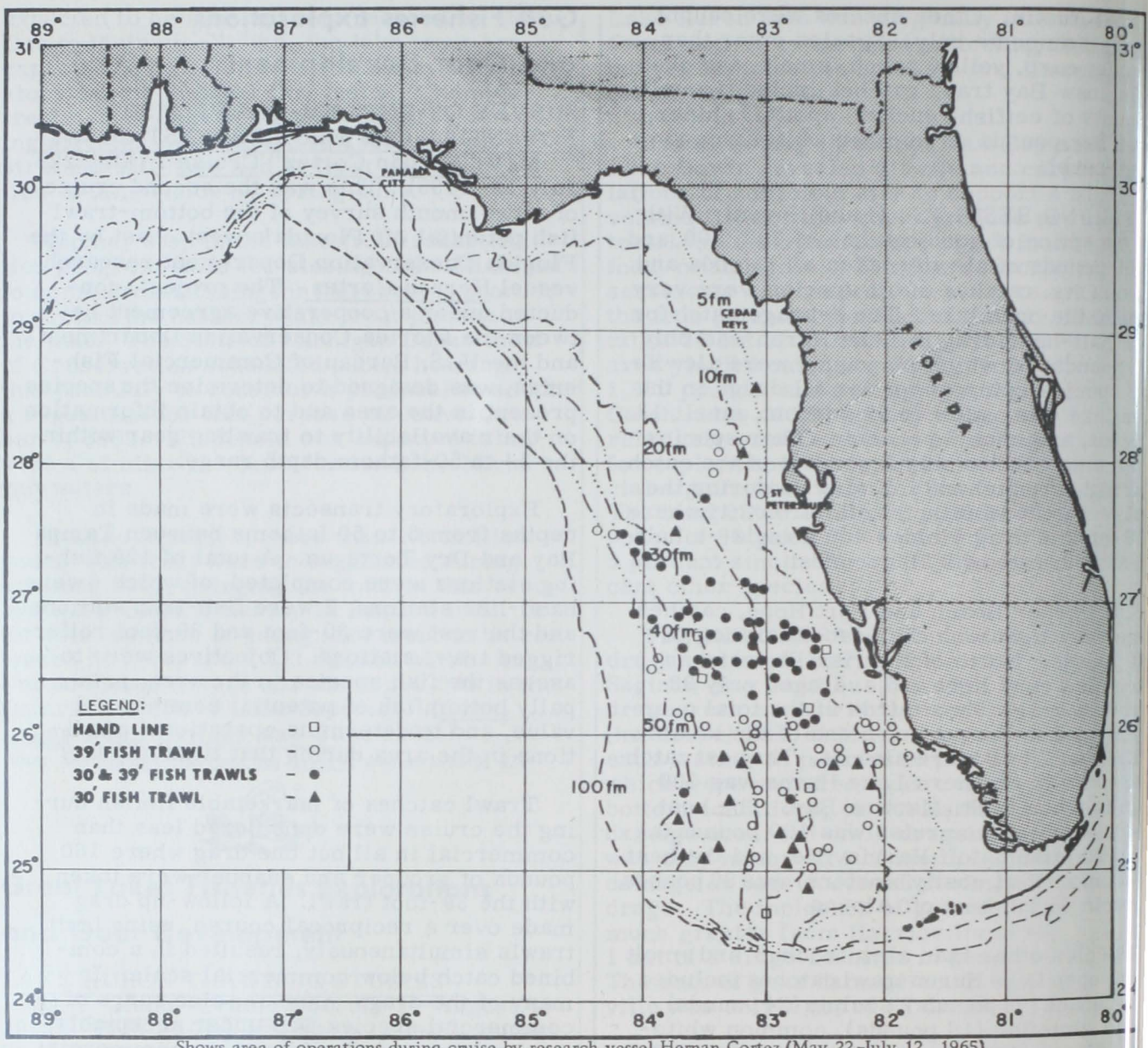
SURVEY OF BOTTOM-TRAWL FISH POTENTIAL OFF FLORIDA WEST COAST: M/V "Hernan Cortez" Cruise 2 (May 22-July 12, 1965): This was the second cruise of a two-month survey of the bottom-trawl fish potential off Florida's west coast by the Florida Conservation Department research vessel Hernan Cortez. The project, conducted under a cooperative agreement between the Florida Conservation Department and the U. S. Bureau of Commercial Fisheries, was designed to determine the species present in the area and to obtain information on their availability to trawling gear within the 5- to 50-fathom depth range.

Exploratory transects were made in depths from 5 to 50 fathoms between Tampa Bay and Dry Tortugas. A total of 129 fishing stations were completed, of which 6 were hand-line stations, 2 were fish-trap stations, and the rest were 30-foot and 39-foot roller-rigged trawl stations. Objectives were to assess the fish species in the area, principally bottomfish of potential commercial value, and to determine operational conditions in the area during that time of year.

Trawl catches of marketable finfish during the cruise were considered less than commercial in all but one drag where 160 pounds of grouper and snapper were taken with the 39-foot trawl. A follow-up drag made over a reciprocal course, using both trawls simultaneously, resulted in a combined catch below commercial scale. In many of the drags made, the size range of commercial species was under acceptable market size and considered noncommercial.

Operational conditions in the area covered were generally good. In certain areas between Fort Myers and Cape Romano (in depths from 10 to 25 fathoms), bottom "grasses" hindered satisfactory trawling. Loggerhead and fire sponges were also present in a number of drags but not in sufficient amount to hamper fishing. Trawling with the roller-rigged nets was accomplished over much rough bottom without appreciable gear damage. Only one hang-up occurred, and the gear was not damaged in that instance.

Fish catches of commercial interest included gray snapper, lane snapper, and red



Shows area of operations during cruise by research vessel Hernan Cortez (May 22-July 12, 1965).

and black grouper. Vermilion snapper, with one exception, were caught less frequently and were of smaller size than in the previous cruise of the Hernan Cortez (April-May 1965). Catches of Spanish lobster, in general, were progressively less frequent as the trawling operation moved southward from Tampa Bay to the Dry Tortugas area.

Surface school fish were observed usually inside the 10-fathom depth contour with the greatest concentrations occurring near Tampa Bay, Fort Myers Beach, and Cape Romano. Trolling lines fished between stations caught little tuna, king mackerel, and Spanish mackerel. Routine meteorological and water temperature data were recorded throughout the cruise.

Note: See Commercial Fisheries Review, August 1965 p. 39

Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES: Production by Areas, July 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for July 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the Internation

U.S. Production 1/ of Fish Meal, Oil, and Solubles, July 1965 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
July 1965:			
E. Gulf Coasts 2/	43,306	35,733	16,961
W. Coast 3/	3,639	1,998	1,529
Total	46,945	37,731	18,490
January-July 1965 Total	134,966	112,003	52,950
January-July 1964 Total	141,827	112,402	57,039

1/ Does not include crab meal, shrimp meal, and liver oils.
2/ Includes a small quantity from the Great Lakes.
3/ Includes American Samoa and Puerto Rico.

Association of Fish Meal Manufacturers are shown in the table.

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Major Indicators for U. S. Supply, June 1965: United States production of fish meal and fish oil in June 1965 was lower by 6.8 and 4.4 percent, respectively, as compared with June 1964. Production of fish solubles was lower by 8.2 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, June 1965

Item and Period	1/1965	1964	1963	1962	1961
	(Short Tons)				
Fish meal:					
Production:					
June	45,605	48,953	34,863	61,171	54,399
January-June 2/	88,021	96,651	91,079	121,836	102,502
January 3/	-	235,252	255,907	312,259	311,265
Imports:					
June	44,474	34,515	18,452	26,453	19,317
January-June	209,858	256,429	181,934	140,886	107,826
January	-	493,143	376,321	252,307	217,845
Fish solubles 4/:					
Production:					
June	17,329	18,873	15,430	24,725	17,772
January-June 2/	34,460	39,025	42,825	51,487	40,200
January 3/	-	93,296	107,402	124,649	112,254
Imports:					
June	224	249	323	872	207
January-June	3,230	2,051	2,439	4,290	1,219
January	-	4,505	7,112	6,308	6,739
	(1,000 Lbs.)				
Fish oils:					
Production:					
June	40,124	42,861	28,193	54,924	49,686
January-June 2/	74,272	78,624	69,589	96,522	89,025
January 3/	-	180,198	185,827	250,075	258,118
Imports:					
June	18,111	117	255	4,921	21,035
January-June	30,170	56,139	97,806	63,005	68,128
January	-	151,469	262,342	123,050	122,486

1/ Preliminary.
2/ For 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.
3/ Total amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
4/ Only menhaden fish was produced in 1964 or during the first 6 months of 1965.

* * * * *

Production, June 1965: During June 1965, a total of 45,605 tons of fish meal and 40.1 million pounds of marine-animal oil was produced in the United States. Compared with June 1964 this was a decrease of 3,348 tons of fish meal and about 2.7 million pounds of marine-animal oil. Fish solubles production amounted to 17,329 tons--a decrease of 1,544 tons as compared with June 1964.

U. S. Production of Fish Meal, Oil, and Solubles, June 1965 1/ with Comparisons

Product	June		Jan.-June		Total
	1/1965	1964	1/1965	1964	1964
	(Short Tons)				
Fish Meal and Scrap:					
Herring	1,041	1,228	2,392	1,643	8,881
Menhaden 2/	38,478	39,683	64,476	65,430	160,349
Tuna and mackerel	2,398	2,347	11,397	8,832	21,113
Unclassified	3,688	5,695	9,756	20,746	34,809
Total	45,605	48,953	88,021	96,651	225,152
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	10,100
Grand total meal and scrap	3/	3/	3/	3/	235,252
Fish Solubles:					
Menhaden	14,883	15,819	25,072	26,588	68,738
Other	2,446	3,054	9,388	12,437	24,558
Total	17,329	18,873	34,460	39,025	93,296
	(1,000 Pounds)				
Oil, body:					
Herring	431	2,089	1,013	2,221	10,354
Menhaden 2/	38,463	39,599	69,919	71,142	157,730
Tuna and mackerel	326	381	1,684	1,508	4,816
Other (including whale)	904	792	1,656	3,753	7,298
Total oil	40,124	42,861	74,272	78,624	180,198

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

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U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-June 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 6 months in 1965 amounted to 297,879 short tons--55,201 tons (or 15.6 percent) less than during the same period in 1964. Domestic production was 8,630 tons (or 8.9 percent) less, and imports were 46,571 tons (or 18.2 percent) lower than in January-June 1964. Peru continued to lead other countries with shipments of 178,856 tons.

The United States supply of fish solubles during January-June 1965 amounted to 37,690 tons--a decrease of 8.2 percent as compared with the same period in 1964. Domestic production dropped 11.7 percent, but imports of fish solubles increased 57.5 percent.

U. S. Supply of Fish Meal and Solubles, January-June 1965

Item	Jan.-June 1/1965	Jan.-June 1964	Total 1964
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	64,476	65,430	160,349
Tuna and mackerel	11,397	8,832	21,113
Herring	2,392	1,643	8,881
Other	9,756	20,746	44,909
Total production	88,021	96,651	235,252
Imports:			
Canada	20,875	30,015	54,769
Peru	178,856	205,135	348,025
Chile	5,128	10,036	12,942
So. Africa Rep.	1,900	9,538	18,581
Other countries	3,099	1,705	4,826
Total imports	209,858	256,429	439,143
Available fish meal supply	297,879	353,080	674,395
Fish Solubles:			
Domestic production 2/	34,460	39,025	93,296
Imports:			
Canada	915	1,031	1,553
So. Africa Rep.	-	780	987
Other countries	2,315	240	1,965
Total imports	3,230	2,051	4,505
Available fish solubles supply	37,690	41,076	97,801

1/Preliminary.
2/50-percent solids.

Maine Sardines

CANNED STOCKS, JULY 1, 1965:

Canners' stocks of Maine sardines on July 1, 1965, were down sharply from those of the same date in 1964 and 1963. But by the end of July 1965, the current season's pack was ahead of that in July 1964.

The new Maine sardine-canning season opened on the traditional date of April 15, 1965, and the pack to August 7, 1965, totaled 689,579 standard cases, as compared with a pack of 409,536 cases for the same period in 1964. Herring landings increased sharply in the last week of July 1965, and the 22 active Maine sardine canneries were packing. Landings continued good into early August. The herring were of good size and excellent quality.

When the new season began on April 15, 1965, there was at the canners' level a carry over of 290,000 cases. Through July 1, 1965 the 1965 pack season had yielded 241,000 cases.

The new law legalizing year-round canning of Maine sardines will remove the traditional December 1 closing date for the packing season. The new legislation will open winter canning to all Maine sardine packers and will allow winter canning with domestic as well as imported herring.

Final data showed the 1964 pack as 865,751 standard cases (100 cans of $3\frac{3}{4}$-oz.) canned in 23 plants in Maine. That was much less than the 1,619,000 cases packed during 1963, but more than the 754,000 cases packed during the regular season in 1961 when fishing was extremely poor.

Note: See Commercial Fisheries Review, Aug. 1965 p. 43.

Marketing

EDIBLE FISHERY PRODUCTS, FIRST HALF 1965:

United States per capita consumption of fishery products during the first half of 1965 dropped below that of a year earlier and retail prices averaged a little higher. Lower domestic landings and smaller stocks of frozen edible fishery products on hand at the beginning of the year contributed to the drop in available supplies.

As the second half of 1965 began, frozen stocks of fishery products were substantially below a year earlier. Fillets and steaks of cod, flounder, ocean perch, and fish sticks and portions were below the same period a year earlier. Except for scallops, frozen stocks of other shellfish products on July 1, 1965, were down.

United States fishery landings are expected to rise seasonally in the third quar-

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1965, with Comparisons 1/

Type	Unit	1964/65 Season 7/1/65	6/1/65	4/1/65	1/1/65	11/1/64	1963/64 Season 7/1/64	6/1/64	4/1/64	1/1/64	11/1/63
Distributors	1,000 actual cases	194	198	236	238	291	234	254	291	261	308
Canners	1,000 std. cases 2/	295	203	314	538	629	514	499	658	1,063	1,255

1/Table shows marketing season from November 1-October 31.
2/100 $3\frac{3}{4}$-oz. cans equal 1 standard case.
Source: U. S. Bureau of the Census, Canned Food Report, July 1, 1965.

te[illegible] the year when about 40 percent of the annual U. S. fishery catch for human food will be landed. Shrimp landings in the third quarter will rise seasonally and the catch will probably be above 1964. The 1965 red salmon fishing season is nearly ended; preliminary data show a much larger pack this year than in 1964. Supplies of many other processed fishery products will remain smaller, however, than during July-September 1964. Retail prices of fishery products will likely average a little higher than in 1964.

In the smaller of the two main sheds of Fulton Fish Market, New York City, journeyman in foreground is transporting a box of saltwater fish to truck for delivery.

According to the U. S. Bureau of Labor Statistics, retail prices for selected fishery products were higher in January-June 1965 than in the same 6 months of 1964. Prices were up 4.7 percent for frozen packaged shrimp (10-oz.); 0.6 percent for fresh or frozen fish; 0.6 percent for canned tuna ($6\frac{1}{2}$-oz.); and 6 percent for canned sardines ($3\frac{1}{4}$-oz.).

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's August 1965 issue of National Food Situation (NFS-113).

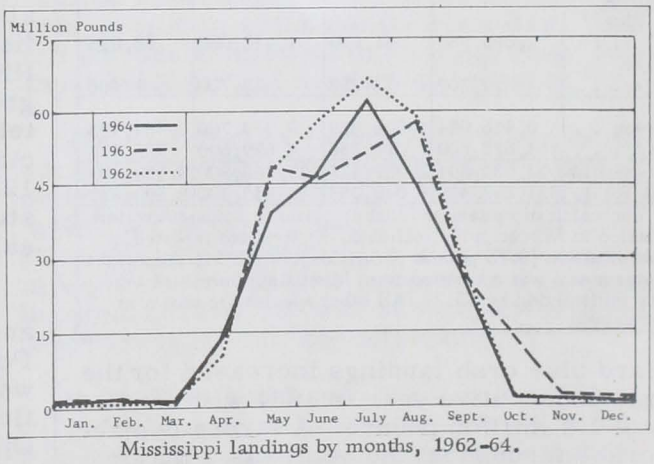
Mississippi

LANDINGS AND FISHERY TRENDS, 1964: In 1964, commercial fishermen of the Mississippi Gulf Coast landed 331.9 million pounds of fish and shellfish with an ex-vessel value of $8.0 million. Compared with the previous year, that was a decline of 3 percent in quantity and 6 percent in value. Menhaden, red snapper, shrimp, oysters, and crab continued to be the leading species in the catch.

Finfish: Food fish landings of 3.1 million pounds valued at $579,000 in 1964 were about the same as in the preceding year. Red snapper was the major item in those landings. Several of the snapper vessels made trips to new fishing grounds in the Caribbean off the coast of Honduras during December 1964. The initial trips had some gear difficulty, but good fishing areas were found.

Industrial fish landings of 316.3 million pounds valued at $4.5 million made up 99 percent of the total finfish landings in 1964. Otter-trawl industrial landings (78.4 million pounds valued at $1.3 million) went mainly to petfood canning plants. Menhaden landings (for meal and oil) in 1964 of 237.8 million pounds valued at $3.1 million were generally at normal levels, although down 5 percent in quantity from the previous year.

The high-volume menhaden fishery is supported by an abundant resource and mechanized equipment. Large-capacity refrigerated vessels using hydraulic blocks for net handling, and large fish pumps to move fish from the purse seine into the hold of the vessel are now standard in the menhaden fleet. Spotter planes work closely with the fleet. The pilot of a spotter plane guides and directs the actual setting of the net from a purse-seine vessel via radio communication. Each menhaden plant now uses two or more spotter planes for their fleet operations.



Mississippi landings by months, 1962-64.

Shellfish: Shrimp landings in 1964 of 6.4 million pounds (heads-on weight) valued at $1.8 million were down 31 percent in quantity and 27 percent in value from the previous year. Catches were down in the summer brown shrimp fishery as well as the fall white shrimp fishery.

Oyster landings of 4.8 million pounds of meats were slightly above the 1963 harvest and represented another good year of production with Mississippi reefs again producing most of the oysters. Oysters landed from Mississippi reefs during the 1964 dredging season were of better quality than the previous year with a subsequent higher yield of meat which increased their value. Raw oyster trade was steady during the year with normal seasonal market fluctuations.

Mississippi Landings, 1964 and 1963

Species	1964		1963	
Fish	Lbs.	$	Lbs.	$
Bluefish. . . .	14,630	1,463	4,600	460
Cabio.	900	71	2,900	227
Croaker . . .	500	30	2,600	141
Drum:				
Black	45,730	3,060	16,900	1,258
Red or redfish	49,950	7,187	59,000	7,471
Flounders . . .	57,345	7,810	59,300	7,203
Groupers . . .	268,350	29,302	271,400	29,859
King whiting or kingfish. .	322,960	19,802	256,600	16,077
Menhaden . .	237,832,600	3,131,440	250,429,200	3,276,215
Mullet	249,530	12,391	382,200	19,561
Pompano . . .	200	100	300	86
Sea Catfish . .	16,650	836	12,700	618
Sea trout:				
Spotted . . .	148,130	30,522	80,300	20,074
White	26,150	1,399	68,200	3,745
Sheepshead . .	49,300	3,847	29,700	2,341
Snapper, Red.	1,849,190	460,872	1,885,800	471,397
Spanish mackerel	660	62	1,500	151
Spot	7,200	540	4,400	257
Unclassified, Industrial use	78,425,210	1,348,925	72,576,600	1,210,320
Total Fish. .	319,365,185	5,059,659	326,144,200	5,067,461
Shellfish				
Crabs, Blue:				
Hard	1,285,980	81,610	1,112,000	63,633
Soft and peeler . . .	1,700	252	2,700	466
Shrimp, heads-on . .	6,416,024	1,804,829	9,374,700	2,484,195
Oysters	4,828,600	1,098,736	4,679,500	975,115
Total shellfish	12,532,304	2,985,427	15,168,900	3,523,409
Grand Total.	331,897,489	8,045,086	341,313,100	8,590,870

Note: The catch of oysters and shrimp taken in Louisians waters but landed in Mississippi is included. Oysters are reported in pounds of meats (8.75 pounds per gallon). In 1964, the weight of oyster meats was converted from Mississippi barrels of oysters by multiplying by 15.7. All other species are shown in round weight.

Hard blue crab landings increased for the second consecutive year in 1964 with landings of 1.3 million pounds. A strong demand for crabs throughout the year was a major factor in the increased landings.

Mississippi boatyards were busy during the year with orders for a variety of fishing vessels for local and out-of-State owners.

National Fisheries Center and Aquarium

DIRECTOR NAMED BY SECRETARY OF THE INTERIOR:

The appointment of Dr. Warren Jensen Wisby as Director of the new National Fisheries Center and Aquarium planned for Washington, D. C., was announced by Secretary of the Interior Stewart L. Udall, August 23, 1965.

Wisby who assumed his new post in September 1965, has been associated with the University of Miami's Institute of Marine Sciences since 1959 as a researcher, teacher, administrator, and as a designer of its new laboratory building. Concerned primarily with the study of the behavior and sensory physiology of marine organisms, his research projects have included hearing and color vision in the lemon shark, hearing and allied senses in fish, and behavioral changes in fish resulting from simulated weightlessness. His shark projects and his work in oceanography were subjects of national and local television programs. As a research associate with the University of Wisconsin from 1952 to 1959, he directed graduate students studying the behavior of fresh-water fish and salmon.

Dr. Warren Jensen Wisby.

The $10 million National Fisheries Center and Aquarium, scheduled to be built in East Potomac Park by 1968, will be one of the world's largest and most complete installations for exhibiting and studying aquatic life. Operated by Interior's Bureau of Sport Fisheries and Wildlife, it will display in natural surroundings more than 1,000 species of fish, amphibians, and invertebrates. There will be a trout stream, a Gulf bayou, and tanks designed especially for tropical fish and dolphins.

The installation will have facilities and specimens to aid aquatic research in such

diverse fields as fish diseases, behavior of aquatic organisms, nutrition of fish, and medicinal values of antibiotics produced by marine animals.

The Fisheries Center is distinctive among Federal institutions because it will repay both construction and operational costs by nominal admission charges.

See Commercial Fisheries Review, December 1964 p. 48.

National Fisheries Institute

NATIONWIDE PROMOTIONS FOR OCTOBER 1965

FISH 'N SEAFOOD PARADE:

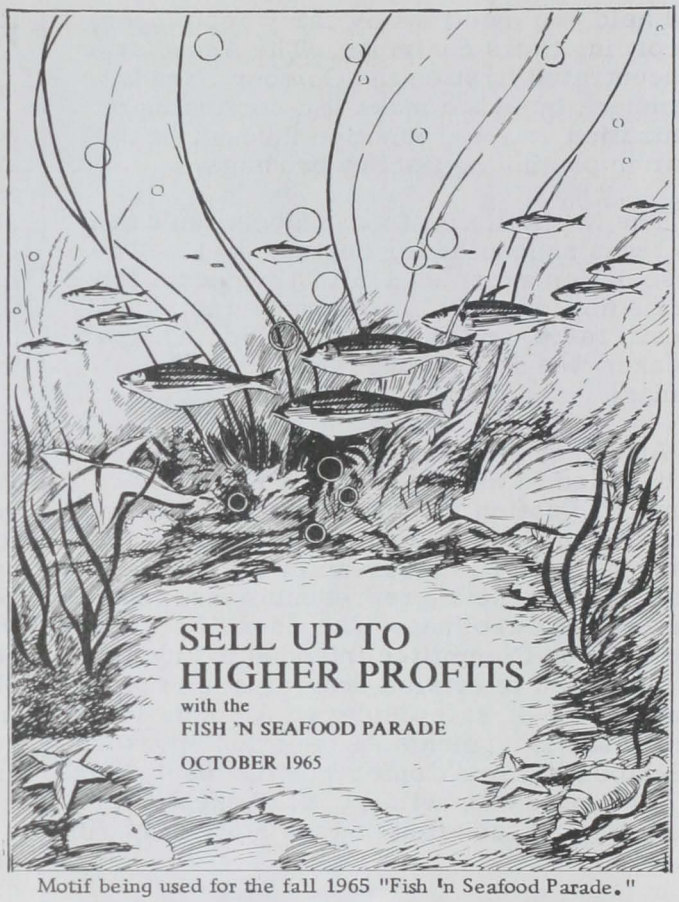
Luncheons and dinners in observance of "Fish 'n Seafood Parade" during October were scheduled in many regions of the United States. Point-of-sale display materials were distributed; local newspaper, radio and TV advertising was scheduled--all to tie in with the annual national campaign sponsored by the National Fisheries Institute (NFI), in cooperation with the U. S. Bureau of Commercial Fisheries.

According to the chairman of the Fish 'n Seafoods Promotions Division of NFI, "The Parade represents a high point in the fish-industry's promotion plans, when it is possible--through the cooperation of many interests--to bring to the consuming public the great varieties of seafoods available today."

Chicago's Seafood Club gave a dinner for press, trade, and industry representatives, at which there was a display of merchandising materials. Actual marketing and merchandising of fishery products were discussed.

Active on the West Coast were northern and southern California groups and the Northwest Fisheries Association. NFI members in northern California formed the Seafood Educational Association. The Association sponsored a buffet luncheon for the press, distributed display materials, and followed through with publicity and advertising in local newspaper and radio media.

The Southern California Fisheries Association's press party was given on October 18 at Cigo's Restaurant in San Pedro. Special features were a certificate for each guest which could be redeemed for a package of seafood specialties, and a question-and-answer period in which guests answered, "What can our association do to help you know more about seafoods and the fishing industry."



Motif being used for the fall 1965 "Fish 'n Seafood Parade."

The chairman of Northwest Fisheries Association's Fish 'n Seafood Parade says that their promotion was in four parts: (1) a Fish 'n Seafood Sweepstakes Contest; (2) an in-store-display contest; (3) a kick-off banquet in September; and (4) a promotional campaign in which advertising was scheduled for local newspapers, radio, and television.

In the East and South, Boston, New York City, Philadelphia, Nashville, Atlanta, and Florida cities had Parade activities of their own. The chairman of the Boston group says that their Parade dinner was given at Anthony's Pier 4 on October 4. Guests were members of the press, radio, television, as well as restaurant owners, industry men, and chain store executives.

The Delaware Valley Fish and Seafood Association, recently organized in Philadelphia,

had held two meetings by early September, according to its chairman. The Association concentrated first on the October Parade. Members intend to make it a continuing organization that will function throughout the year in promoting fishery products.

The Nashville Seafood Association's banquet was scheduled for September 15. The Association expected 115 to 120 guests from the fishing industry, chain stores, restaurants, press, radio, and television. The principal speaker was F. P. Longeway, Jr., general manager of NFI.

Atlanta's Fish 'n Seafood Parade Committee tied in with the Frozen Food Buy-Time Promotion. Those two groups formed the Frozen Food Council of Georgia, according to the U. S. Bureau of Commercial Fisheries marketing representative for Georgia and the Carolinas. The Council's Fish and Seafood Committee intended to buy time on radio and television programs, and purchase point-of-sale displays. Also, the North Carolina Fishermen's Association sponsored a Seafood Editors Conference, October 20-22, in cooperation with the Southeastern Fisheries Association and the State of North Carolina.

Further south, the executive secretary of the Southeastern Fisheries Association reports that chairmen for the Miami, Tampa, and Jacksonville areas of Florida were appointed, and that the Association ordered display materials. The Association's executive secretary said, "We intend to hold some kind of seafood dinner in each of the metropolitan areas of the State during October. These dinners will be in addition to the annual seafood promotion dinner sponsored by the Association."

Notes: (1) For further details write to Fish 'n Seafoods Promotions Division, National Fisheries Institute, 1614 Twentieth Street, NW., Washington, D.C. 20009.
(2) See Commercial Fisheries Review, Aug. 1965 p. 44.

New England

REPORT ON ADVANTAGES OF STERN TRAWLING ISSUED BY FEDERAL RESERVE BANK OF BOSTON:

A new technological development applied to commercial fishing in New England may slow or reverse the declining trend of this regional industry, according to a report published in the Federal Reserve Bank of Boston's August 1965 Business Review.

A new technique known as "stern trawling," whereby nets and gear are operated from the stern of the vessel rather than from the side as in conventional trawling, may increase the industry's productivity, raise wages and the return on capital, reduce the hazards of fishing, and greatly improve the New England fishing industry's competitive position as against foreign imports of fishery products, the bank said.

In the first of a two-part study of the New England fishing industry, the Boston Reserve Bank reports its study of the 74-foot fishing vessel Narragansett, the first stern trawler in New England's fishing industry. Over a period of nine months, according to the bank report, this vessel's average catch per trip was more than 70,000 pounds, about 29 percent higher than the average for a comparable group of vessels using the conventional trawling method. In addition, the Narragansett needed only 7 men in the crew as against an average of 9 on side trawlers.

The report said the Narragansett yielded about $1,731 more in revenue per trip. Its crew members received an average of $8,35 in wages for the 9 months, compared to an average of $5,040 for crew members of the side trawlers. It pointed out that "The results of statistical tests indicated that the stern trawling technique made a significant difference in productivity between the Narragansett and the control group vessels."

The report also cited the results of similar experiments conducted by the Departme of Fisheries of New Brunswick, Canada, wh showed that stern trawlers "were more sea worthy and allowed more rapid handling of the gear. As a result, stern trawlers were on the average able to catch 20 percent mo fish per trip." A survey conducted by the bank of foreign owners of stern trawlers co firmed those findings.

The Reserve Bank's questionnaire surve of vessel owners in New England indicated that 60 percent of that region's fishermen feel stern trawlers would be more producti But the ultimate economic feasibility of ste trawling, the report pointed out, depends o construction costs. A survey of shipbuilde showed that costs for a stern trawler woul be about 20 percent higher than for a side

...er, and this additional cost increases ...ciation and interest payments along with ...ze of the initial down-payment required.

...e report concludes with "However, the ...er crew on a stern trawler decreases ...tion and indemnity insurance costs. ...ther, the stern trawler's higher pro...ity should offset its higher construc...osts, resulting in a greater return on ...ed capital."

...he second part of the study the Reserve ...plans to evaluate the 1964 Fishing Fleet ...vement Act as a means of financing this ...shing technology. (Federal Reserve ...of Boston, August 23, 1965.)

...h Atlantic

...T FISHING ACTIVITY ...COAST, AUGUST 1965:

...cause Georges Bank was blanketed by ...fog during most of August, aerial ob...tions were restricted and only a limited ...ssment of Soviet fishing activity was ...ble. The observations were made by ...aff of the Fisheries Resource Manage...Office, U. S. Bureau of Commercial ...ries, Gloucester, Mass., which con...weekly reconnaisance flights coopera...with the U. S. Coast Guard. It was ...ated that in August the Soviet fishing ...n Georges Bank did not exceed 75 ves...Of those, 53 were sighted and identi...19 fish factory stern trawlers, 26 ...rawlers, 7 processing and refrigerated ...orts, and 1 tug. This compares with ...ssels sighted during their peak in July ...nd 137 vessels in August 1964.

...iet fishing operations during the month ...lly ranged from the Cultivator Shoals ..."southeast part" of Georges Bank, 100 ...miles east of Cape Cod. Although ...of the vessels were actively engaged in ...g operations, only moderate catches, ...sting mostly of whiting, were observed ...taken. Toward the end of the month ...in Soviet fleet continued to operate in ...s adjacent to Nova Scotia and New...and. Those areas are known for their ...nce of whiting.

...re was no indication that the Soviets ...preparing any major emphasis for tak-

Fig. 1 - Soviet processing factory stern trawler Grumant (Skryplev class). Six vessels of this type were operating on Georges Bank during August 1965.

ing herring. It is possible that environmental changes may have delayed the development of that fishery. At about the same time a year earlier, a fleet of about 175 vessels converged on the Georges Shoals area and took very large catches of herring at their spawning stage.

Fig. 2 - Deck view of Soviet processing factoryship Matochkin Shar while on Georges Bank. This is one method the Soviets use in handling the fish catch from "Pioneer class" side trawlers. The fish are bundled in sections of netting and then hoisted over the side or pulled in through a stern opening.

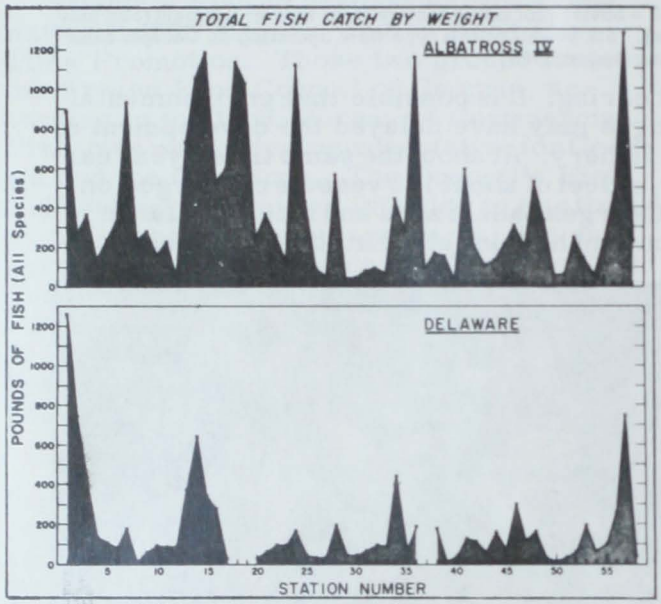
In addition to the Soviet vessels, a stern trawler from Poland and another from Romania were fishing on Georges Bank during August.

Note: See Commercial Fisheries Review, September 1965 p. 34.

North Atlantic Fisheries Explorations and Gear Development

SAMPLING EFFICIENCY TESTS OF TWO RESEARCH VESSELS:

M/V "Delaware" Cruise 65-6 (July 8-15, 1965): To compare the sampling efficiency of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware with that of the Bureau's research vessel Albatross IV was the purpose of this cruise. The Delaware accompanied the Albatross IV for 7 days during the latter vessel's regular summer investigations (Cruise 65-10) in July-August.



Comparison of fish catches during sampling efficiency cruises by M/V Delaware and M/V Albatross IV.

Both vessels occupied a total of 58 fishing stations during this part of the cruise. Each vessel set its gear at approximately the same time and made parallel 30-minute tows, generally within ½ mile of each other. All fish caught were identified, weighed by species, and measured. Haddock scale samples were taken and fish stomachs were examined from as many stations as possible. All abnormally pigmented blackback flounders were frozen and returned to the Bureau's Biological Laboratory at Woods Hole, Mass. One large white hake weighing 46 pounds and measuring 127 centimeters (50 inches) in length was frozen and returned to the laboratory.

Data obtained on the cruise showed that the Albatross IV caught more fish, by weight, than the Delaware at 80 percent of the stations. Species composition of the Albatross IV catches was also greater than Delaware catches.

North Atlantic Fisheries Investigations

BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL HOLDS OPEN HOUSE:

M/V "Albatross IV" Cruise 9 (June 25-27, 1965): The research vessel Albatross IV, operated by the U. S. Bureau of Commercial Fisheries, was open to the public on June 26, 1965, at the Port of Gloucester, Mass., as part of that port's annual "Blessing of the Fleet" celebration. The open house attracted about 700 visitors who were invited to tour the vessel. Various displays were set up for the occasion in the vessel laboratories, and the closed circuit television system with which the vessel is equipped was in operation.

The visitors were interested in looking over the vessel facilities and learning more about the fishery research being done.

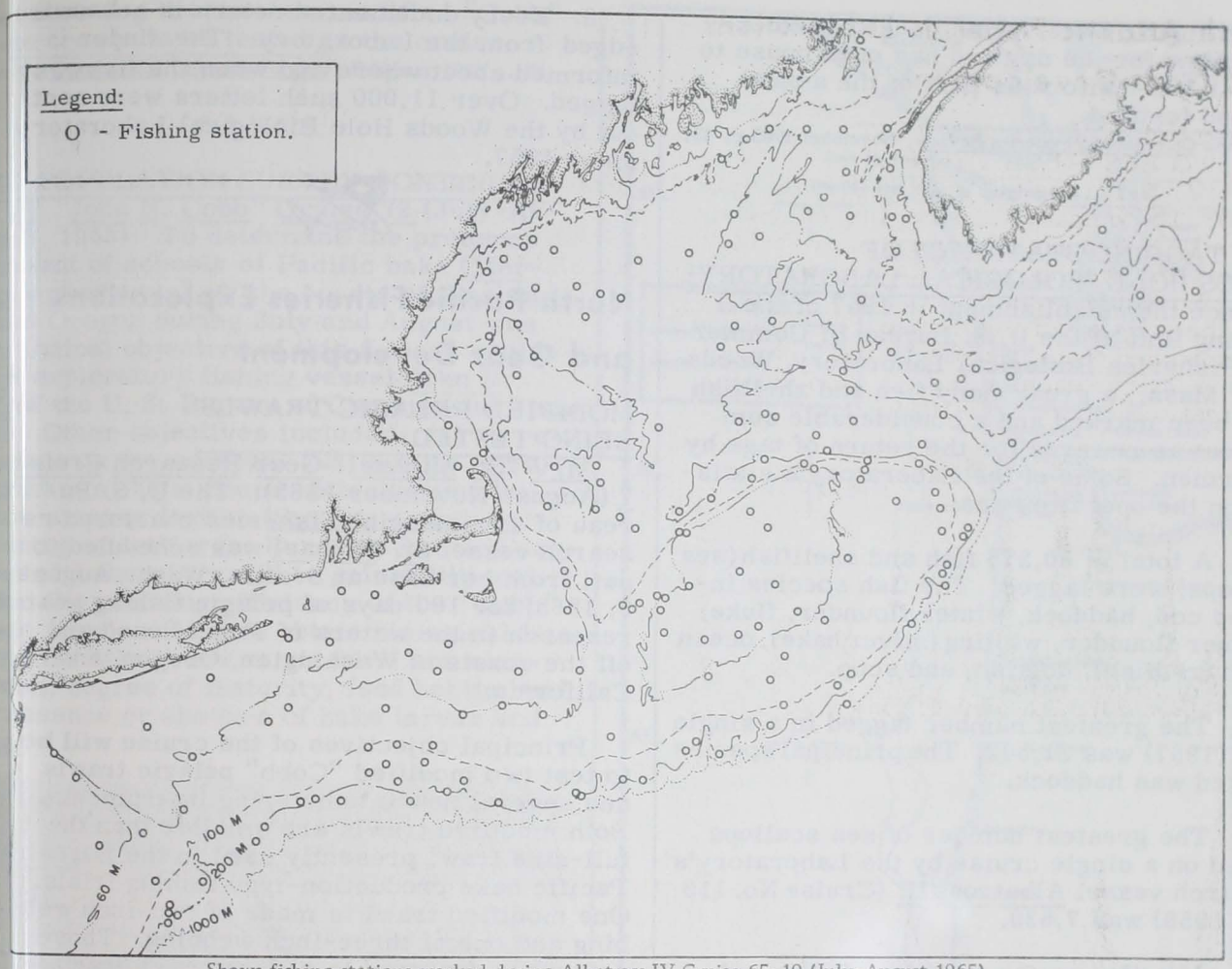
* * * * *

SUMMER DISTRIBUTION AND ABUNDANCE OF GROUNDFISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 65-10--Part I (July 7-21); Part II (July 28-August 10, 1965): To determine the summer distribution and relative abundance of groundfish species from the Bay of Fundy southward to Hudson Canyon was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. Another objective was to compare the sampling efficiency of the Bureau's exploratory fishing vessel Delaware with that of the Albatross IV.

The cruise was conducted in two parts. The first part was from the Bay of Fundy southward to include the Gulf of Maine, Browns Bank, and part of Georges Bank. During the first 7 days of the cruise both vessels towed side by side to compare groundfish catches.

A total of 189 otter trawl stations were occupied during the cruise and all fish caught were identified and measured. Other activities included: (1) total weight by species was obtained from each tow; (2) stomach contents of a number of species were examined and recorded; (3) length-weight data from selected species were obtained; (4) scale samples were taken from haddock, yellowtail



Shows fishing stations worked during Albatross IV Cruise 65-10 (July-August 1965).

der, and silver hake; (5) otoliths were
cted from whiting (silver hake), red
and white hake; (6) invertebrates caught
h tow were preserved.

lected fish species were preserved dur-
e cruise for the collection at Syracuse
rsity, and samples of sea herring were
ted for the Bureau's Biological Labor-
, Boothbay Harbor, Me. A number of
ater tows were made with the Isaacs-
trawl, and collections of intestines from
ted species were made by personnel
the Massachusetts Institute of Technol-
n the study of the occurrence of botu-
organisms in marine fishes. Bathy-
ograph casts were made at each sta-
nd between stations.

dult haddock were caught from Georges
northward at almost every station in
s less than 80 fathoms, with the largest
ntrations of them on Georges Bank.
haddock were caught with the bottom trawl in the southern New England area only. Cod were abundant on Browns Bank and at one station off the Maine Coast. Ocean perch were found in deep water throughout the Gulf of Maine, with the largest catch made along the eastern side of Nova Scotia. Whiting (silver hake) were distributed throughout the sampling area in varying numbers. The best catch of that species was in the southern New England area and along the Maine Coast. Good catches of pollock were made at several stations in the Gulf of Maine and on Browns Bank. Spiny dogfish were concentrated on Stellwagen Bank and on Nantucket Shoals.

Tows with the Isaacs-Kidd mid-water trawl were made off Cape Cod, western Nova Scotia, the Northeast Peak of Georges Bank, and around the Hudson Canyon primarily to obtain young-of-the-year haddock. Young haddock between 3 to 7 centimeters (1.2 to 2.8 inches) in length were caught in midwater only around the Hudson Canyon area. Other species such as ocean perch, hake, and butterfish were also taken in mid-water.

On August 7 the vessel docked at Rockland, Me., for the day and had open house to about 1,100 visitors as part of the annual seafood festival.

Note: See Commercial Fisheries Review, November 1965 p. 43.

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FISH TAGGING STATISTICS OF WOODS HOLE BIOLOGICAL LABORATORY:

Since the establishment in 1957 of the Tagging Unit at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., a great many fish and shellfish have been marked and a considerable sum paid out as rewards for the return of tags by fishermen. Some of the Laboratory's statistics on the operation are:

1. A total of 80,576 fish and shellfish (sea scallops) were tagged. The fish species included cod, haddock, winter flounder, fluke, summer flounder, whiting (silver hake), ocean perch (redfish), dogfish, and scup.

2. The greatest number tagged in a single year (1957) was 21,342. The principal species marked was haddock.

3. The greatest number of sea scallops tagged on a single cruise by the Laboratory's research vessel Albatross III (Cruise No. 113, June 1958) was 7,539.

4. Alewife, winter flounder, fluke, and scup were tagged by various State biologists in cooperative programs with the Woods Hole Biological Laboratory. In all, 18,881 fish were tagged on that basis.

5. The Laboratory has been cooperating with the Commonwealth of Massachusetts on a winter flounder tagging program. Over 10,000 fish were marked as of July 1965, of which 2,381 tags were returned by that time.

6. The total amount paid in rewards since 1957 was $14,479 as of July 1965. The greatest amount in a single year (1964) was $3,223. For the most part the rewards were paid directly to fishermen by the Bureau's port agents.

7. Fishermen and plant workers of New Bedford, Mass., received the greatest share of reward payments--$5,012 or 36 percent of the total amount.

8. Every documented return is acknowledged from the Laboratory. The finder is informed about where and when the fish was tagged. Over 11,000 such letters were sent out by the Woods Hole Biological Laboratory since 1957.

North Pacific Fisheries Explorations and Gear Development

MODIFIED PELAGIC TRAWLS BEING TESTED:

M/V "St. Michael" Gear Research Cruise 7 (August-November 1965): The U. S. Bureau of Commercial Fisheries chartered research vessel St. Michael was scheduled to sail from her base at Seattle, Wash., August 5, 1965, for 100 days of pelagic fishing gear research in the waters of Puget Sound and off the coasts of Washington, Oregon, and California.

Principal objectives of the cruise will be to test two modified "Cobb" pelagic trawls and several new telemetering instruments. Both modified trawls are smaller than the full-size trawl presently used in the Bureau's Pacific hake production-type fishing trials. One modified trawl is made of two-inch webbing and one of three-inch webbing. Those nets were designed to reduce trawl drag and gilling of hake.

Several new instruments will be tested during this cruise. A catch load indicator will show the amount of fish in the cod end while the net is being towed; an echo-sounder transducer will be mounted on the trawl headrope; and a mercury switch will turn on a light in the pilothouse when the trawl footrope is a prescribed distance from the bottom. The trawl depth sensors will be connected to the trawl instead of to the hydrofoil trawl boards. Tests will continue on a wireless depth indicator.

The modified "Cobb" pelagic trawls and telemetering instruments will first be tested in Puget Sound. Comparison tows will then be made alongside the chartered trawler Western Flyer, which will be towing a full-size "Cobb" pelagic trawl and using the depth telemetering system with the sensors mounted just ahead of the hydrofoil trawl boards. SCUBA-equipped divers will spend several

day[illegible]bserving the two new modified "Cobb" pel[illegible] trawls to be tested on the cruise.

Note[illegible]e Commercial Fisheries Review, February 1965 p. 35.

* * * * *

HAA[illegible]POPULATION SURVEY CONTINUED:

[illegible] "John N. Cobb" Cruise 72 (July-Augus[illegible] 1965): To determine the presence and[illegible]ent of schools of Pacific hake (Merluc[illegible] productus) off the coasts of Washington[illegible] Oregon during July and August was the[illegible]cipal objective of this 6-week cruise by [illegible]xploratory fishing vessel John N. Cobb[illegible] the U. S. Bureau of Commercial Fisheri[illegible] Other objectives included: (1) to record[illegible]ta on the seasonal availability of Pacifi[illegible]ake in Puget Sound collected incidentali[illegible] a spiny dogfish (Squalus acanthias) coll[illegible]ng effort for the Bureau's Seattle Technoll[illegible]al Laboratory; (2) to gain additional datt[illegible] the catching efficiency of the "Cobb" pell[illegible] trawl; and (3) to obtain biological data on [illegible]fic hake, such as size and sex composs[illegible]n, degree of maturity, food habits, and thee[illegible]sence or absence of hake larvae and eggs.

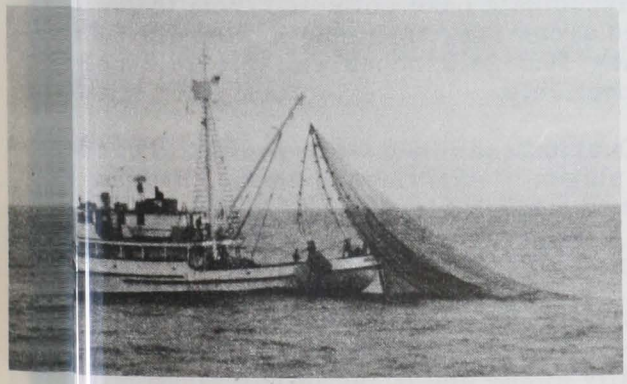


Fig. [illegible] M/V John N. Cobb of the U.S. Bureau of Commercial Fisheries hauling in the large pelagic trawl.

[illegible]l plans to survey waters off California[illegible]e changed to permit intensified coverage[illegible]ween Grays Harbor, Wash., and the Colu[illegible]a River where the Bureau's chartered rese[illegible]h vessel Western Flyer was engaged in co[illegible]mercial-type hake fishing trials.

[illegible]R USED: The principal gear used during[illegible] first half of the cruise was a standard Ma[illegible] "Cobb" pelagic trawl constructed of 3-i[illegible] mesh monofilament webbing. The prii[illegible]al gear used during the second half of the[illegible]ise was a standard Mark II "Cobb" pell[illegible] trawl constructed of 3-inch mesh mu[illegible]lament (12 thread) webbing. Both

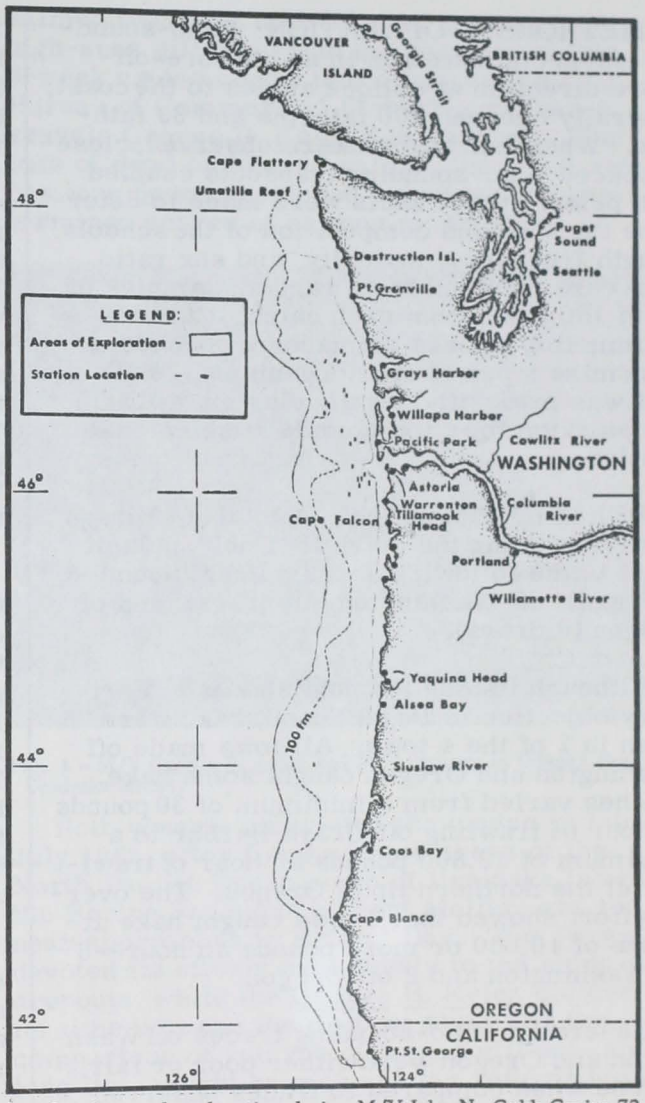


Fig. 2 - Areas of exploration during M/V John N. Cobb Cruise 72 (July 7-August 13, 1965).

trawls were fished with two aluminum hydrofoil-type otter boards on 60-fathom bridles. To facilitate the retention of smaller organisms, both trawls were equipped, on most tows, with a 12-foot marlon liner constructed of $\frac{9}{16}$-inch mesh webbing.

Fishing depth of the net was monitored using a dual electrical depth telemetering system having a depth sensing unit housed at the terminus of each electrical towing cable. In addition, a Furuno depth sensing unit was attached to the trawl headrope (4 hauls only); used with a hydrophone the unit similarly permitted a pilothouse read-out of gear depth. A high-resolution, low-frequency echo-sounder was used to locate fish schools. Other gear used included a one-meter plankton net and a 900-foot range bathythermograph (BT).

METHODS OF OPERATION: Echo-sounding transects were run in an onshore-offshore direction at oblique angles to the coast, generally between 200 fathoms and 30 fathoms. When fish traces were observed, closely spaced echo-sounding transects coupled with pelagic trawl hauls were made to determine the size and composition of the schools. Length frequency, maturity, and sex ratio data were obtained from random samples of about 150 hake from each catch. Cursory examination of hake stomachs was made to determine types of food organisms. A BT cast was made after each pelagic trawl haul and plankton tows were made at selected localities.

PELAGIC TRAWLING: A total of 29 drags was made using the Mark II "Cobb" pelagic trawl in the following areas: Puget Sound (4 drags), off Washington (16 drags), and off Oregon (9 drags).

Although fishing for dogfish was the primary objective in Puget Sound, hake were taken in 2 of the 4 tows. All tows made off Washington and Oregon caught some hake. Catches varied from a minimum of 30 pounds an hour of trawling off Grays Harbor to a maximum of 12,800 pounds an hour of trawling off the northern tip of Oregon. The overall effort showed that 8 tows caught hake at a rate of 10,000 or more pounds an hour--6 off Washington and 2 off Oregon.

Generally, echo-sounding traces off Washington and Oregon were either poor or fair to good when compared to traces observed on previous cruises. The exception was on July 21 while transecting between the 210- and 30-fathom contours just north of the California-Oregon border when excellent traces were observed between 65 and 48 fathoms. Those traces appeared about 6 fathoms above bottom. Due to heavy seas it was not possible to fish the pelagic trawl on that date. Fair echo-sounding traces were observed WNW. of Destruction Island between 86 and 40 fathoms. The area between Destruction Island and Point Grenville, Wash., showed weak traces between 275 and 38 fathoms with occasional fair to good traces centered between the 81 to 46 fathom contours. Sounding transects taken between Grays Harbor and the Columbia River Lightship showed patches of fair to good traces, suggestive of Pacific hake, centered between the 70- to 31-fathom contours. Some good traces appeared at 80 fathoms over a bottom depth of 305 to 130 fathoms due west of Willapa Harbor. Fair traces observed south of the Columbia River were centered between 60 and 55 fathoms. Sporadic traces occurred between 76 and 73 fathoms just north of Tillamook Head, Oreg., with fair to good traces occurring just SW. of Tillamook Head at 58 fathoms. Occasional patches of weak traces appeared between Tillamook Head and Cape Falcon, Oreg. South of Cape Falcon, traces were poor and continued poor to waters off the Siuslaw River, Oreg., where fair traces were observed from 80 to 75 fathoms. Fair traces reappeared 30 miles south of Cape Blanco, Oreg., in 110 to 134 fathoms. In general, echo traces and catches were better north of the Columbia River Lightship than south.

FISH SIZE, MATURITY, AND STOMACH CONTENTS: As in previous cruises, hake collected from Puget Sound were smaller than those collected off Washington and Oregon. Samples of male hake collected from Puget Sound, off Washington, and off Oregon ranged in length from 7-20.8 inches, 16.5-25.9 inches, and 14.6-23.2 inches, respectively; female hake collected from those three areas ranged in length from 7.5-23.6 inches, 16.5-25.2 inches, and 16.1-27.2 inches, respectively.

Ovaries examined were limited to various stages of early development. Testes showed a much wider range of development and fully developed multilobed testes with running milt were common.

Stomach contents of Pacific hake were examined from each catch. Stomachs were usually empty and occasionally Euphausiids were observed; pink shrimp or herring were noted rarely. Also, in cooperation with the Bureau's Seattle Technological Laboratory, 10,000 pounds of hake were delivered to a commercial fish company in Warrenton, Oreg., for fillet and fish-fillet block studies. Samples of hake were collected and frozen aboard the vessel for a comparative study of meat firmness relative to different geographic areas.

Cruise 73: The M/V John N. Cobb left Seattle, August 30, 1965, on a 5-week exploratory hake-fishing survey along the coast of California. The cruise was to be conducted in cooperation with the Bureau's Seattle and La Jolla Biological Laboratories, Seattle Technological Laboratory, and the Californi

Department of Fish and Game. The primary purpose was to determine the geographic and bathymetric distribution of schools of hake along the California coast during September. Secondary objectives were to (1) obtain biological data on Pacific hake, and (2) obtain additional data relative to the catching efficiency of the Mark II "Cobb" pelagic trawl.

Note: See Commercial Fisheries Review, September 1965 p. 40.

North Pacific Fisheries Investigations

MORE SOCKEYE SALMON GROWTH AND MORTALITY RATES IN BRISTOL BAY STUDIED:

Over 6,700 sockeye salmon were tagged off the eastern Aleutians by the chartered vessel Yaquina during a cruise from May 21 to July 15, 1965. The vessel, together with the George B. Kelez and the Paragon, was engaged in a U. S. Bureau of Commercial Fisheries study of the growth and mortality rates of Bristol Bay salmon during their last 400 days of ocean life. Data on natural growth and mortality is needed in order to estimate the effect of the extensive Japanese high-seas salmon fishery on the potential yield of the Bristol Bay stocks.

To capture fish for tagging, the Yaquina used a knotless nylon purse seine 400 fathoms long and 30 fathoms deep. At the first fishing station (located south of Dutch Harbor in the North Pacific Ocean), a total of 3,[illegible] sockeye were measured, tagged with Petersen discs, and released. In Bristol Bay Petersen disc and spaghetti tags were attached to an additional 2,757 sockeye salmon. The major tagging station in Bristol Bay was located northeast of Port Moller where shallow water required modification of the purse seine so it would fish only to 20 fathoms.

Many more sockeye were captured than could be tagged. In 36 sets, over 14,000 fish were taken. The consistently good catches also helped forecast the large run to Bristol Bay in 1965.

Note: See Commercial Fisheries Review, July 1965 p. 38.

* * * * *

SALMON DROPOUT FROM GILL NETS STUDIED:

M/V "George B. Kelez" and "Paragon" (June-July 1965): To study the dropout of salmon from gill nets (loss of salmon from high-seas gill nets) was the purpose of this 6-week cruise conducted jointly by the U. S. Bureau of Commercial Fisheries research vessels George B. Kelez and Paragon. The loss of dead or injured salmon from gill nets has long been considered a serious but undetermined source of salmon mortality.

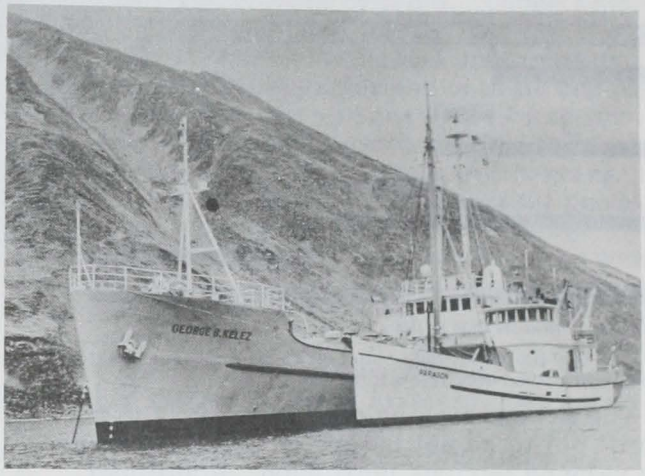


Fig. 1 - M/V George B. Kelez and M/V Paragon in Udagak Bay, Unalaska Island.

Both vessels completed the cruise in mid-July 1965, after fishing broad areas of the North Pacific Ocean south of Unalaska Island, the Bering Sea north of Port Moller, and the near approaches to Bristol Bay. The Paragon devoted its efforts exclusively to the study of dropouts, while the George B. Kelez divided its time between the dropout study and the comparison of returns of tagged gill net- and long line-caught salmon and tag returns from oxygen-treated and untreated salmon.

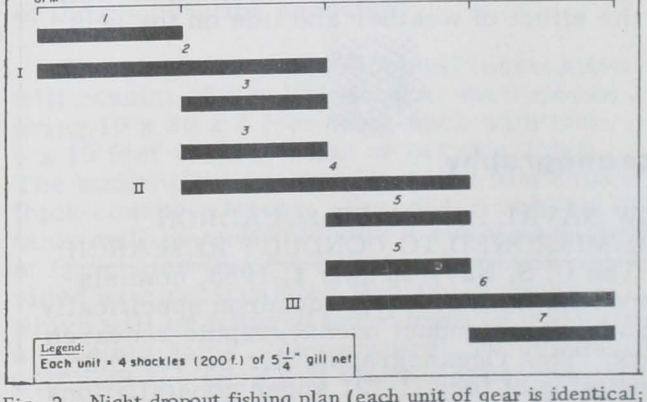


Fig. 2 - Night dropout fishing plan (each unit of gear is identical; length of shaded area refers to fishing time).

Two fishing techniques were used to determine dropout rates. The night fishing plan consisted of fishing units (4 shackles per unit)

of $5\frac{1}{4}$-inch mesh gill net over 3 different time periods during the night (fig. 2). The catch of a 6-hour unit when compared with the catches of similar units fished during the first 3-hour portion and the second 3-hour portion of the same period provides an estimate of the dropout rate. A total of 5,134 salmon was taken by 28 night dropout sets made by the two vessels.

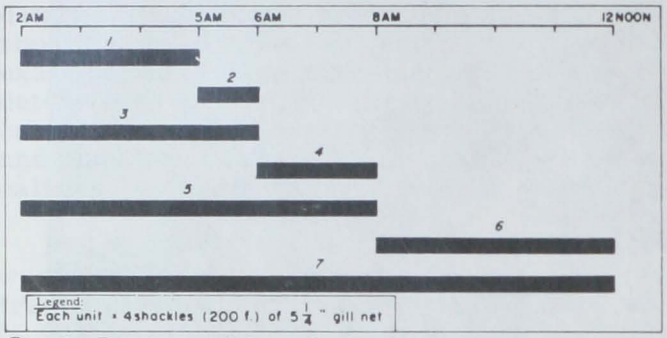
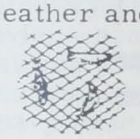


Fig. 3 - Day dropout fishing plan (each unit of gear is identical; length of shaded area refers to fishing time).

The second fishing plan required 4 units of gill net to be set before daylight and fished for varying periods until noon. Additional units were set and fished concurrently for shorter periods (fig. 3). The day dropout sets caught 1,019 salmon.

In each of the two fishing plans the rate of dropout is determined by the discrepancy between the catch of the unit fished continuously and the sum of the catches of the units fished shorter portions of the same period. Analysis of the data, at the Bureau's Biological Laboratory, Seattle, Wash., will take into consideration several variables encountered including sea lion and shark activity along the nets, variation in the abundance of fish, and differences in fishing time, as well as the effect of weather and tide on the nets.



Oceanography

NEW NAVAL AIRCRAFT SQUADRON COMMISSIONED TO CONDUCT RESEARCH:

The U. S. Navy on July 1, 1965, commissioned its first aircraft squadron specifically organized to conduct oceanographic research work. This Oceanographic Air Survey Unit, consisting of four C-121 super constellations and one C-54 skymaster, will be based at the U. S. Naval Air Station, Patuxent River, Md. It will be under the technical control of the Commander, U. S. Naval Oceanographic Office.

The use of aircraft in oceanography is not new. In 1953, the Oceanographic Office began using aircraft for its Project Magnet. Those planes have since logged over one-half million survey miles in support of a worldwide magnetic charting program.

Also, a super constellation has been used since 1963 to collect surface temperatures and wave profiles for the Oceanographic Office Antisubmarine Warfare Environmental Prediction System (ASWEPS).

For the third project, known as "Birdseye," planes have been used for about four years in an intensive ice research effort in the Central Arctic Basin. (Newsletter, National Oceanographic Data Center, June/July 1965.)

Oregon

SHRIMP FISHERY TRENDS, SUMMER 1965:

The 1965 Oregon shrimp season opened on March 1 and will close on October 31. Shrimp landings in Oregon during the summer of 1965 were running below those in the same period in 1964, probably due to the high percentage of small shrimp in the catch. The appearance of many small shrimp of the 1964 year-class in the 1965 landings may be an indication of good future harvests.

Effective August 2, 1965, the Oregon Fish Commission closed Oregon ports to landings of pink shrimp caught off the northern California coast. The closure was ordered to support the California Fish and Game Department's decision to prevent additional landings of shrimp from a large shrimp bed located just south of the California-Oregon border. The 1965 harvest quota of 1 million pounds of shrimp for that particular bed was fulfilled in late July 1965. The closure did not affect fishing on shrimp beds off the Oregon coast nor landings of Oregon shrimp in Oregon ports. (Oregon Fish Commission, July 29, 1965.)

* * * * *

CONSTRUCTION OF NEW WILLAMETTE FALLS FISHWAY TEMPORARILY DELAYED:

Bids received in the summer of 1965 for construction of the first phase of the Willamette Falls fishway were in excess of avail-

abo[illegible]unds and engineering estimates and wee[illegible]rejected by the Oregon Fish Commissio[illegible] Because of the insufficient time remai[illegible]ng before winter high water at the site, it [illegible]decided to postpone any readvertising fo[illegible]ds until early in 1966. In the meantime al[illegible]nning and construction details will be ca[illegible]lly studied and evaluated in the hope tha[illegible]ceptable bids will be obtained at the lat[illegible]date.

[illegible]spite the delay caused by rejection of th[illegible]ds, engineers of the Oregon Fish Commi[illegible]on feel the ultimate completion date of th[illegible]tire fishway at Willamette Falls need noo[illegible]essarily be postponed beyond the origina[illegible]rget of 1967.

[illegible]e new fishway is to be the very latest in [illegible]dern design in contrast to its predecessoo[illegible]hich was first built in 1904 and which, th[illegible] rebuilt and supplemented over the yee[illegible], all but failed to pass fall chinook and coo[illegible]salmon during the low water flows in th[illegible]illamette River. With the new fishway, it [illegible]elieved the potential annual escapement of[illegible]ring and fall chinook and coho salmon ann[illegible]eelhead in the Willamette could reach 288 [illegible]0 fish, a dramatic increase over presenn[illegible]capement. The greatest potential incree will be in fall chinook and coho salmonn[illegible]illions of fingerlings of those species haa[illegible]lready been liberated in the upper Willaue in contemplation of their using the nee[illegible]ssage facility on their return as adults. (Oo[illegible]n Fish Commission, July 27, 1965.)

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EX[illegible]RIMENTAL LIVE
FI[illegible]HOLDING FACILITY
FOC[illegible]OWER DESCHUTES RIVER:

[illegible]struction of an experimental adult fall chh[illegible]k holding facility near the mouth of the De[illegible]tes River was under way in midsummo[illegible]65, according to the Oregon Fish Commn[illegible]n. The purpose of the installation is too[illegible]rmine the suitability of Deschutes Rii[illegible]water for holding adult fall chinook untill[illegible] mature sufficiently to provide eggs fo[illegible]h cultural purposes. The facility was exx[illegible]ed to be in operation by August 12, 19[illegible]to assure accommodation of the 1965 faa[illegible]inook run. Urgency of the project was baa[illegible]on the expected completion of the John Daa[illegible]m in 1968 with subsequent flooding ouu[illegible]main stem spawning areas used by as mn[illegible]s 60,000 fall chinook each season.

The results of this initial operation on the Deschutes will be used to guide future planning for handling fish in the area. The fisheries agencies cooperating in the project, which will be operated by the Oregon Fish Commission, include the Washington Department of Fisheries, Washington Department of Game, Oregon Game Commission, and the U. S. Fish and Wildlife Service. Those agencies have recommended jointly that the Corps of Engineers provide artificial propagation facilities as mitigation for the loss of the fall chinook spawning area in that portion of the main stem Columbia River to be flooded by the John Day Dam. The Corps is financing the study. A site for the experimental ponds on the east bank of the Deschutes just upstream from the U. S. Highway 30 bridge was provided by the Oregon Parks and Recreation Division of the State Highway Department.

The Director of the Oregon Fish Commission said that before any sizable investment is made in a production facility it is essential that the feasibility of holding adult fall chinook in Deschutes River water be thoroughly investigated. During recent years water temperatures as high as 69° F. have been recorded from the lower Deschutes during late summer. Optimum temperature for holding fall chinook is considered to be about 55° F., but falls have been successfully held at considerably higher temperatures. It was pointed out that with a substantial number of fall chinook flooded out of their usual spawning areas, it becomes necessary to handle the fish in the best manner possible to keep from losing that segment of the run. Artificial propagation appears to offer the best solution to the situation in the opinion of the cooperating agencies.

The temporary experimental installation will consist of 4 holding tanks, each measuring 10 x 30 x 7 feet deep, each with two 4 x 10 feet sorting tanks of varying depth. The tanks will have wooden sides and 2-inch thick concrete floors. Two of the holding tanks will be operated with a continuous flow of Deschutes River water and 2 will be provided with recirculated Deschutes water which will be filtered and cooled to maintain a constant 55° F. temperature. Each pond will hold 100 adult fall chinook taken for the purpose from the fishway at The Dalles Dam.

When the eggs ripen in the fall they will be stripped from the fish at the facility and shipped for incubation and eventual rearing

to the Oregon Fish Commission's experimental Pelton hatchery. Some will also go to the U. S. Fish and Wildlife Service's hatchery on Abernathy Creek, Wash., where they will be hatched and the fingerlings reared to liberation size.

The problem is a critical one, the Commission director stated. All of the State and Federal fish and game agencies in the area are dedicated to finding a workable solution to the problem of perpetuating this important segment of the fall chinook population. (Oregon Fish Commission, Portland, August 2, 1965.)

Oysters

MARYLAND OBSERVATIONS FOR 1965:

An August 12, 1965, bulletin issued by the Chesapeake Biological Laboratory (Solomons, Md.) of the University of Maryland Natural Resources Institute, gives the following report of oyster growth and related data for the Maryland portion of the Chesapeake Bay:

The 1965 Spatfall: The monitoring of spatfall continued in 1965 the same as in 1964 using transite plates as sample cultch. The program was expanded somewhat to include extra stations in the Potomac River, Tangier Sound, and the Severn River.

The setting began earlier than usual in 1965. In the upper St. Marys River, spat were recorded as early as June 8, whereas a year earlier in the same location no spat were found until June 25. Another interesting phenomenon which occurred in some of the higher setting areas was a bimodal setting pattern in which a strong wave of setting during the week of June 8-15 was followed by a slump and then two weeks later setting resumed heavier than ever. The Choptank River area and the upper St. Marys River both show that pattern.

The spat seemed to be setting well in the major seed areas--Tar Bay, Eastern Bay, and the St. Marys. However, very little setting was observed in the Potomac River, and Holland Straits was also failing to show any substantial spatfall again.

The U. S. Bureau of Commercial Fisheries Laboratory at Oxford, Md., again recorded spatfall in the Tred Avon River, Harris Creek, and Irish Creek.

Summary of 1964 Spatfall: The last spatfall recorded by the Chesapeake Biological Laboratory occurred during the week of September 23, 1964, in the Manokin River. There was no substantial setting monitored after the first week in September, and most of the peaks appeared to occur in late July and early August.

Survey: The yearly fall oyster bar survey by the Department of Chesapeake Bay Affairs with the cooperation and assistance of the Chesapeake Biological Laboratory began in October 1964 and continued through the end of the year into January 1965. A total of 730 samples of bottom material were taken, each sample consisting of $\frac{1}{2}$ Maryland oyster bushel. The majority of the samples were obtained from seed or shell plants but some natural rocks were also examined. It was assumed that most of the spat in the areas surveyed had attained enough size to be clearly visible (in one month a spat can grow large enough to be easily seen) but some of the late setting spat were probably missed, since growth slows down and finally stops as the water temperature approaches 41° F. Spat which set too late in the season to grow appreciably before they are forced to stop feeding by the onset of low temperatures are often mistaken for "winter set" when they are discovered the following spring on boat hulls, etc.

The previous year the seasonal spatfall accumulations as determined by the survey were averaged by areas and listed on a diagram of the Maryland oyster-producing area. Since that method of summarizing the survey insofar as it dealt with seasonal spatfall seemed fairly effective it was repeated this year, and the two diagrams make an interesting comparison. The year 1964 was a good setting year in many areas and even seemed to equal or exceed 1961 in such places as Eastern Bay, Tar Bay, and Hooper Straits. Some areas such as the Wicomico on the Potomac and the South River reverted back to their typical low counts after an exceptionally good set in 1963.

Notes: (1) For more detailed data write to the Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. ("Report of Maryland Oyster Observations for 1965," Ref. No. 65-60, August 12, 1965.)

(2) See Commercial Fisheries Review, October 1964 p.

Salmon

NDING TECHNIQUE TESTED
LASKA SOCKEYE SALMON:
o aid migration studies, some Alaskan
on are now being branded like cows.
l numbers are burned on the fish with
heated in water. The new technique
sed on young sockeye salmon in Alaska
e first time in the summer of 1965. I-
l field tests were made at the Brooks
Biological Field Station of the U. S. Bu-
of Commercial Fisheries. The brand
sting of numbers and letters is made
a metal rod (silver tip on copper) heated
iling water and applied for approximate-
e second much like the hot iron used in
ding cattle. The brand remains legible
e fish up to 18 months.

he salmon branding technique was de-
ped under the Fish-Passage Research
ram of the U. S. Bureau of Commercial
eries and has been used in various studies
e Columbia and Snake Rivers.

nding a suitable tag or mark to identify
in research has been a challenging prob-
or fishery biologists. Various types of
and fin-clip marks have been used. But
tists have expressed concern that adding
or clipping fins may interfere with swim-
movements of fish. The new branding
ique does not add any weight to the fish,
oes it remove any fins. The initial suc-
with branding opens possibilities for
and even more extensive use.

e Commercial Fisheries Review, March 1963 p. 60.

* * * * *

UTION THREAT REDUCED
LLAMETTE RIVER:
nergency water releases from power
plus reduced waste disposal by mills
ave saved the fall run of chinook salm-
Oregon's Willamette River--but the
tion danger is far from ended. That was
ituation on the Willamette in late August
according to the Director of the Co-
ia River Program Office of the U. S. Bu-
of Commercial Fisheries. He said fall
ok salmon were passing over Willa-
e Falls at Oregon City in good numbers,
ating "that the reduction in pollution re-
g from recent emergency measures
ncreased the oxygen in the Willamette
gh to sustain fish life."

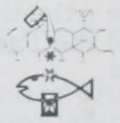
As of August 27, 1965, the daily low oxygen reading had risen to 6 parts per million at Oregon City and 3 parts per million in Portland Harbor, as compared to readings of 3.7 and 1.6, respectively, when the pollution crisis was at its height earlier in August. Such low readings, if continued over an extended period, could have destroyed all the fish in the river.

"The improvement is due to the willingness of the Army Engineers in cooperation with Bonneville Power Administration (BPA) to release water from the electric power storage supply prematurely and also to the mills' reducing their effluent output," the Director of the Columbia River Program said. "We are grateful to BPA, the Engineers, and the mills for their efforts."

But he cautioned that the danger to the fish runs in the polluted Willamette has not been eliminated, even temporarily, and "there is no ground for any relaxation in our attempts to keep the river clean and safe." He pointed out that September is traditionally a month of high pollution in the Willamette and any slackening of pollution control would be very dangerous.

"We are still striving to reach a minimum level of 5 parts per million in Portland Harbor to assure safe passage of the fish there," he said.

The Secretary of the Interior has warned that the releases of clean water stored for power and other purposes must not be counted upon as a substitute for adequate pollution control.



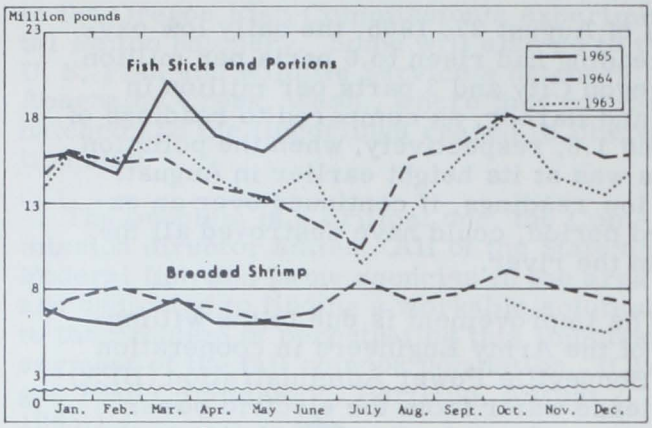
Shrimp

BREADED PRODUCTION, APRIL-JUNE 1965:
United States production of breaded shrimp during the second quarter of 1965 amounted

Table 1 - U. S. Production of Breaded Shrimp by Areas, April-June 1965

Area	1/Apr.-June 1965		Apr.-June 1964	
	Plants	Quantity	Plants	Quantity
	No.	1,000 Lbs.	No.	1,000 Lbs.
Atlantic	14	5,938	14	6,335
Gulf	16	10,167	21	11,574
Pacific	7	1,893	8	1,877
Total	37	17,998	43	19,786

1/Preliminary.



U.S. production, 1963-65.

to about 18.0 million pounds--a decrease of about 1.8 million pounds or 9.0 percent as compared with the same period in 1964.

Table 2-U. S. Production of Breaded Shrimp by Months, 1964-65

Month	1/1965	1964
	. . (1,000 Lbs.). .	
January	6,901	7,347
February	6,613	8,045
March	7,742	7,249
April	6,120	7,027
May	6,023	6,171
June	5,855	6,588
July	-	8,641
August	-	7,299
September	-	7,830
October	-	9,169
November	-	7,852
December	-	7,460
Total	-	90,678

1/Preliminary.

The Gulf States ranked first in the production of breaded shrimp with 10.2 million pounds, followed by the Atlantic States with 5.9 million pounds, and the Pacific States with 1.9 million pounds.

South Atlantic Fisheries

Explorations and Gear Development

LONG-LINING FOR SWORDFISH IN BAHAMA AREA TESTED:

M/V "Oregon" Cruise 102 (July 14-30, 1965): Preliminary investigations to assess the availability of swordfish (Xiphias gladius) were continued during this 18-day exploratory long-line fishing cruise by the U. S. Bureau of Commercial Fisheries research vessel Oregon. The cruise covered the surrounding areas of Grand Bahama, Abaco, and Eleuthera Islands in the Bahamas and along the Continental Shelf off the Florida coast.

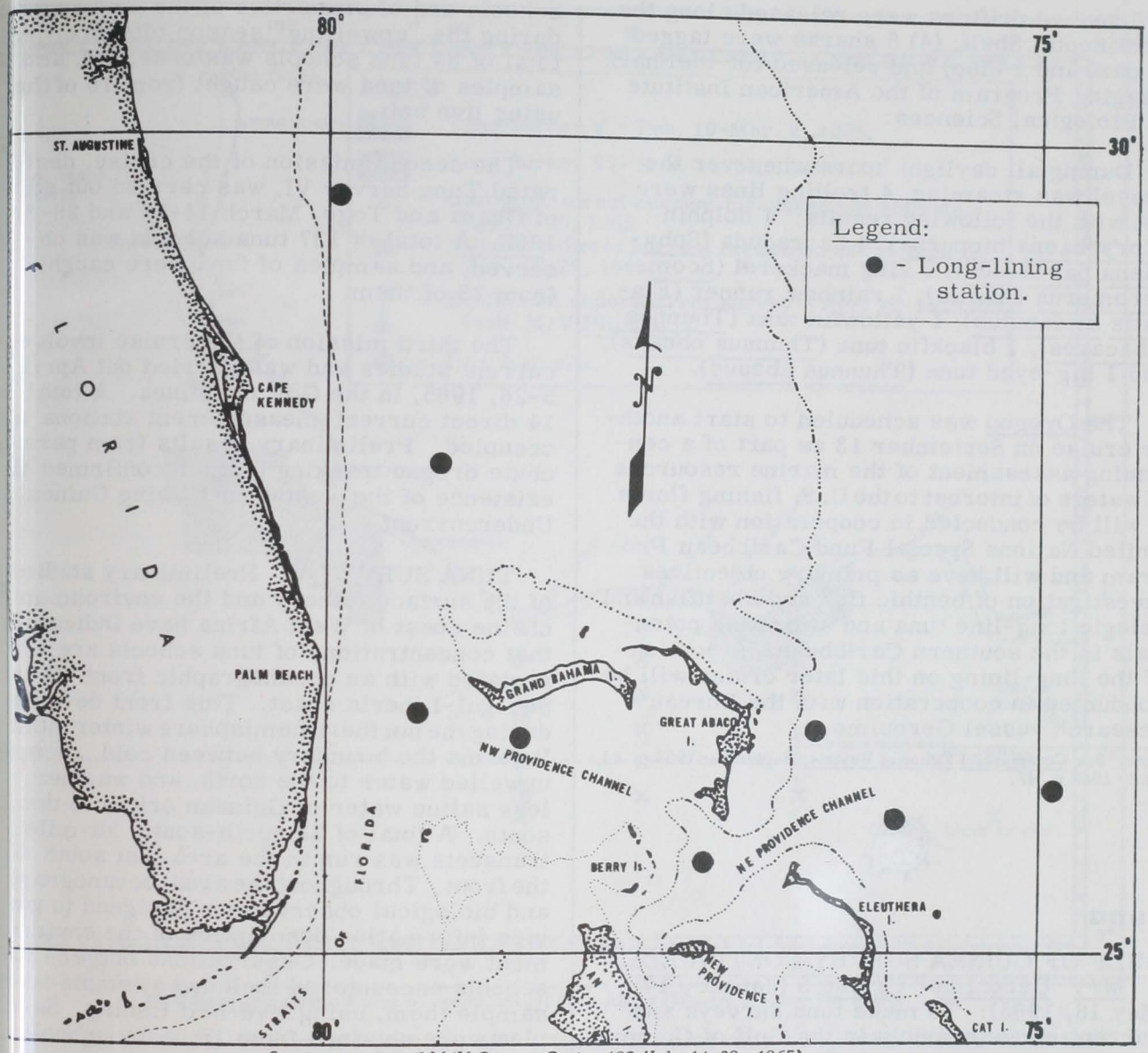
A total of 9 long-line sets (4,300 hooks) in the area covered yielded 17 swordfish. Four sets (2,000 hook total) east of Great Abaco Island and Eleuthera Island where surface water temperatures registered 83° F. yielded 3 swordfish. One 300-hook set in Northeast Providence Channel accounted for one sword fish.

A 500-hook set in Northwest Providence Channel yielded 3 small swordfish weighing 35, 27, and 52 pounds, respectively. Surface water temperature in that area also registered 83° F. Another 500-hook set along the eastern edge of the Straits of Florida east of Palm Beach brought negative results. Forty-two miles north of Matanilla Shoal along the Continental Shelf a 500-hook set yielded 2 swordfish. The heaviest concentration of sharks (22 captures) during the entire cruise was encountered in that area.

The most promising fishing area of the cruise was 70 miles east of St. Augustine between 271 and 351 fathoms in surface water of 84° F. A 500-hook set with 10- and 20-fathom buoy-line drops and baited with frozen squid and Spanish mackerel (¾ to 1 pound) yielded 6 swordfish (round weight 559 pounds).

Incidental catches of blue marlin (Makaira nigricans), sailfish (Istiophorus sp.), yellowfin tuna (Thunnus albacares), big-eyed tuna (Thunnus obesus), blackfin tuna (Thunnus atlanticus), barracuda (Sphyraena sp.), and dolphin (Coryphaena sp.) were made throughout the cruise. Shark damage was negligible.

The exploratory long-line swordfish fishery technique followed a pattern of setting 500 hooks shortly after sunset and allowing the gear to soak throughout the night for about 10 hours. Retrieval of the line commenced at daybreak and continued on an average of 3-4 minutes a basket depending on the amount of fish on the line. The gear is a standard basket of 10 hooks, spaced 12 fathoms apart with 3-fathom gangions and an additional 1-fathom stainless steel leader. Buoy drops varied in length from 10 to 30 fathoms. A breakdown of the drops is as follows: 1,860 hooks (43 percent) at 10 fathoms; 2,090 hooks (46 percent) at 20 fathoms and 350 hooks (11 percent) at 30 fathoms.



Station pattern of M/V Oregon Cruise 102 (July 14-30, 1965).

resh-frozen baits were used exclusively ughout the cruise as follows: 3,470 hooks ackerel($\frac{3}{4}$ to 1 pound size) and 830 hooks uid.

the total 17 swordfish caught, 76 per- (13 fish) were taken on the 20-fathom s. A breakdown of the catch by drop bait s follows: Ten-fathom squid (800 hooks) h; mackerel (1,060 hooks) 2 fish. Twenty- m squid (330 hooks) 2 fish; mackerel 0 hooks) 11 fish. Thirty-fathom mack- (350 hooks) 1 fish.

otal weight of the swordfish caught was pounds. This includes an estimated ht of 80 pounds for the one shark-damaged fish of the entire cruise. Individual weights of the swordfish ranged from 18 to 162 pounds. Five of them weighed over 100 pounds each; another 5 weighed from 75 to 100 pounds; and the remaining 7 fish weighed under 75 pounds each. All swordfish were measured, sex was determined, and stomach contents were examined, with all data recorded for future study.

In addition to the exploratory long-lining, other activities during the cruise were: (1) 9 nekton and 5 dip-net stations were occupied for the collection of juvenile and larval species; (2) 15 bathythermograph (BT) casts were made; (3) in cooperation with the Woods Hole Oceanographic Institute, 120 drift bottles and

170 seabed drifters were released along the Continental Shelf; (4) 5 sharks were tagged (4 dart and 1 disc) and released for the Shark Tagging Program of the American Institute of Biological Sciences.

During all daylight hours whenever the vessel was steaming, 4 trolling lines were set with the following results: 4 dolphin (Coryphaena hippurus), 4 barracuda (Sphyraena barracuda), 2 king mackerel (Scomberomorus cavalla), 1 rainbow runner (Elagatis bipinnulus), 1 yellowfin tuna (Thunnus albacares), 1 blackfin tuna (Thunnus obesus), and 1 big-eyed tuna (Thunnus abesus).

The Oregon was scheduled to start another cruise on September 13 as part of a continuing assessment of the marine resources of waters of interest to the U. S. fishing fleets. It will be conducted in cooperation with the United Nations Special Fund Caribbean Program and will have as primary objectives investigation of benthic fish and shellfish and pelagic long-line tuna and swordfish potentials in the southern Caribbean. A portion of the long-lining on this later cruise will be conducted in cooperation with the Bureau's research vessel Geronimo.

Note: See Commercial Fisheries Review, September 1965 p. 43; July 1965 p. 47.

Tuna

GULF OF GUINEA SURVEY CONTINUED: M/V "Geronimo" Cruise 5 (January 17-May 18, 1965): To make tuna surveys and current measurements in the Gulf of Guinea was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Geronimo. This was the fourth cruise of the Geronimo to West Africa to participate in cooperative international studies of the tropical Atlantic. The Geronimo's Chief Scientist on the cruise said the vessel's latest expedition was successful in accomplishing two main objectives: (1) further measurement of a heretofore unknown ocean current in the Gulf of Guinea, and (2) confirmation of hypotheses about the distribution of tuna schools off West Africa.

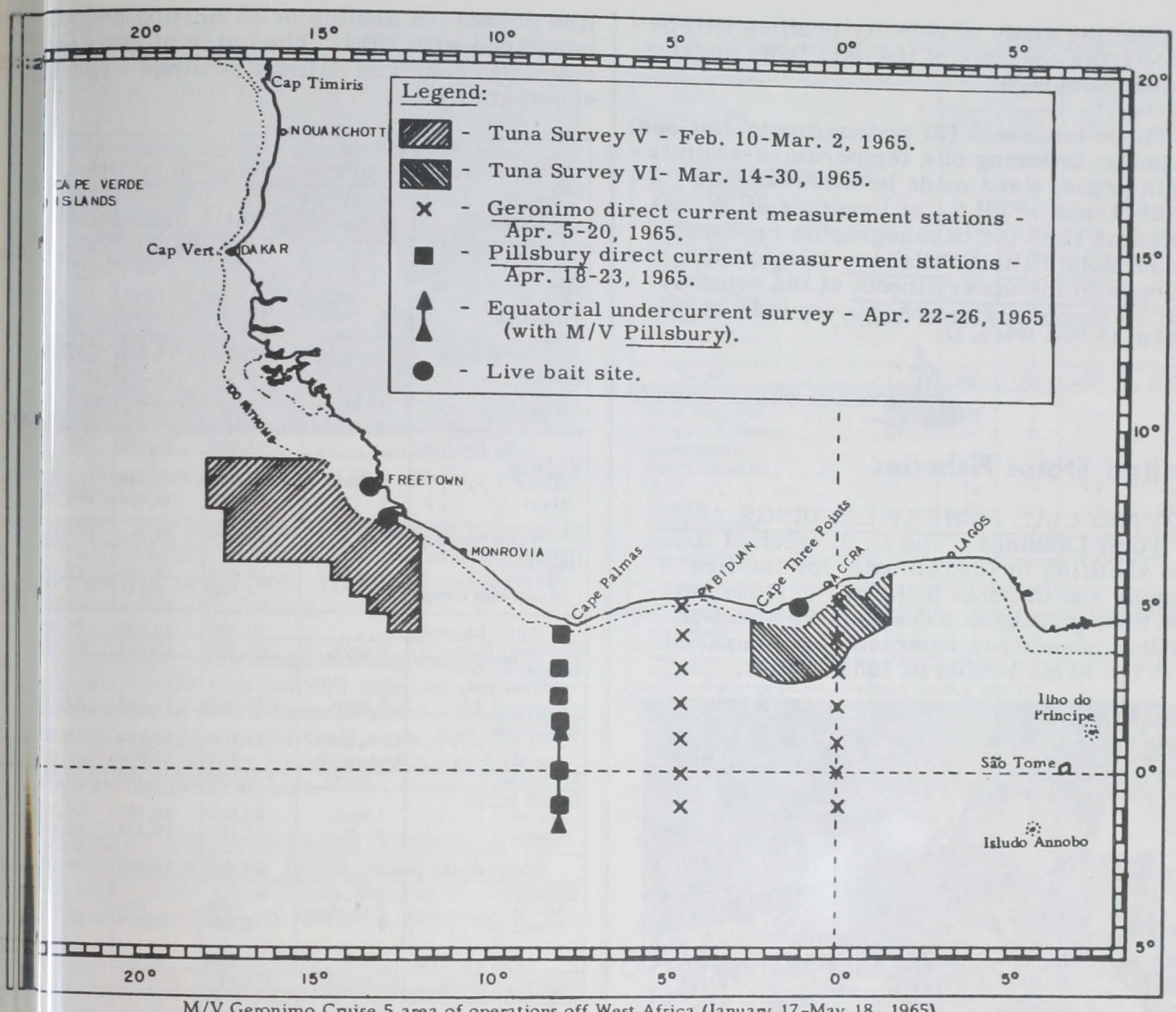
The first mission of the cruise designated Tuna Survey V, was carried out February 10-March 2, 1965, off the coast of Sierra Leone and Liberia to survey the distribution of tuna schools and of properties of the environment during the "upwelling" season offshore. A total of 84 tuna schools was observed, and samples of tuna were caught from 16 of them using live bait.

The second mission of the cruise, designated Tuna Survey VI, was carried out south of Ghana and Togo, March 14-23 and 26-30, 1965. A total of 137 tuna schools was observed, and samples of tuna were caught from 23 of them.

The third mission of the cruise involved current studies and was carried out April 5-26, 1965, in the Gulf of Guinea. A total of 14 direct current-measurement stations was occupied. Preliminary results from parachute drogue tracking further confirmed the existence of the westward-flowing Guinea Undercurrent.

TUNA SURVEY V: Preliminary studies of the surface fishery and the environment off the coast of West Africa have indicated that concentrations of tuna schools are associated with an oceanographic front off the Senegal-Liberia coast. This front develops during the northern hemisphere winter months. It forms the boundary between cold, recently upwelled water to the north, and warmer, less saline water of Guinean origin to the south. A total of 22 north-south, 90-mile transects was run in the area just south of the front. Throughout the area, oceanographic and biological observations designed to provide information descriptive of the environment were made. Observations of the 84 tuna schools encountered included attempts to sample them, using live-bait fishing. Samples were obtained from 16 of the schools. By far the majority of the schools were skipjack of a small size, 5-7 pounds.

A dense concentration of large schools of skipjack was found on February 26, approximately 90 miles south of the location of the front. It would appear that the front itself does not act as a physical barrier to the migration of the tuna, but acts instead as a mechanism for producing increased food. The final maturation of concentrations of food, which may result in concentrations of tuna, could occur some distance from the front itself. In an attempt to obtain samples of the entire spectrum of food available to tuna, a high-speed Neuston net was towed through feeding tuna schools. Food samples also were taken from tuna stomachs.



M/V Geronimo Cruise 5 area of operations off West Africa (January 17-May 18, 1965).

UNA SURVEY VI: A similar pattern of 90-mile transects was followed during Survey VI, carried out offshore from and Togo. During 15 transects, a to- 137 tuna schools was seen, and 23 les of tuna were obtained. Virtually all schools encountered were made up of yellowfin and skipjack, 5 to 7 pounds.

general, those schools were most abun- in the western part of the survey area. owing the initial 10 transects, a repeat ey was made in the area where schools most abundant. The distributional pat- of the repeat survey indicated that the of greatest density of schools had moved ward.

URRENT METER PROGRAM: At each e 14 direct current measurement stations, a reference buoy was anchored to the bottom and a lowering of a Savonious rotor was made to determine the depth of a subsurface current velocity maximum. A surface drogue and a drogue at the depth of the velocity maximum were then released and tracked by radar. At each station, lowerings were made to a depth of 500 meters (1,640 feet) with a recording current meter. In addition, a Nansen cast, productivity station, meter net tow, and Clarke-Bumpus haul were made.

Drogue results indicated the westward-flowing south equatorial surface current in the vicinity of the Equator, the eastward Guinea surface current to the north, the eastward-flowing Atlantic Equatorial Undercurrent, and the westward-flowing Guinea Undercurrent below the Guinea surface current.

Detailed study of velocity profiles will be made after analysis of the data from current meter lowerings.

Three transects (31 hydrographic stations, including lowering of a temperature-salinity-depth probe) were made between latitude 1°30' N. and 1°30' S., at longitude 8° W. At the same time the oceanographic research vessel John Elliott Pillsbury monitored changes in the undercurrent at the equator.

Note: See Commercial Fisheries Review, July 1965 p. 40; Jan. 1965 p. 43; Nov. 1964 p. 57.

United States Fisheries

COMMERCIAL FISHERY LANDINGS, 1965:

Total Landings: The U. S. catch of fish and shellfish in 1965 (mostly for the first 7 months and in some instances various periods through August 27) was down about 18 million pounds (or 1 percent) as compared with the same period in 1964.

Fig. 1 - Brailing red salmon from gill net boat to buying scow in Bristol Bay, Alaska.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch to August 22 was about 273 million pounds--a decline of 16 million pounds compared with 1964. The catch of pinks was down, although red salmon landings were up substantially.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1965 and 1964

Species	Period	1/1965	1964	Total 1964
		(1,000 Lbs.)		
Cod:				
Maine	6 mos.	1,600	1,385	2,4
Mass. 2/	7 "	16,500	17,134	29,5
Total cod		18,100	18,519	31,9
Flounder:				
Maine	6 mos.	900	666	1,1
Mass.	7 "	53,900	53,070	96,6
Total flounder		54,800	53,736	97,7
Haddock:				
Maine	6 mos.	700	1,348	2,9
Mass. 2/	7 "	69,500	78,814	114,2
Total haddock		70,200	80,162	117,2
Halibut 3/:				
Alaska	7 mos.	16,600	12,689	17,0
Wash. and Oreg.	7 "	4,200	6,241	9,3
Total halibut		20,800	18,930	26,3
Herring, Maine	6 mos.	19,800	10,224	60,8
Industrial fish (Maine and Mass.) 4/	7 mos.	42,600	18,540	32,3
Mackerel:				
Jack 5/	to Aug. 27	33,100	46,268	89,6
Pacific 5/	to Aug. 27	800	12,008	26,8
Menhaden	7 mos.	979,900	956,196	1,566,8
Ocean perch:				
Maine	7 mos.	33,800	30,762	58,9
Mass.	7 "	12,100	18,322	30,3
Total ocean perch		45,900	49,084	89,2
Pollock:				
Maine	7 mos.	300	630	1,3
Mass. 2/	7 "	3,500	5,607	10,5
Total pollock		3,800	6,237	11,8
Salmon, Alaska	to Aug. 22	272,800	288,830	312,0
Scallops, sea, New Bedford (meats)	7 mos.	6,400	8,125	12,9
Shrimp (heads-on):				
So. Atl.	7 mos.	8,200	5,365	17,4
Gulf	7 "	93,700	80,770	179,0
Tuna, Calif.	to Aug. 21	168,800	192,726	280,7
Whiting:				
Maine	6 mos.	3,200	4,888	25,3
Mass.	7 "	18,600	26,772	57,3
Total whiting		21,800	31,660	82,6
Total all above items		1,861,500	1,877,380	3,035,6
Other 6/		333,700	336,001	1,487,3
Grand total		2,195,200	2,213,381	4,523,0

1/Preliminary.
2/Landed weight.
3/Dressed weight.
4/Excludes menhaden.
5/Cannery receipts.
6/Includes landings for species not listed.
Note: Finfish generally converted to round weight, crustaceans to weight in the shell and mollusks reported in meats only.

Tuna: Landings in California to August 1 totaled about 169 million pounds--down 24 million pounds compared with the same da

2 - Unloading a small dragger at State Fish Pier, Glouces- Mass.

1964. The principal decrease occurred in lowfin landings, but albacore and bluefin dings also declined. However, albacore duction is improving.

Menhaden: Landings during the first 7 nths of 1965 totaled 980 million pounds -- increase of 24 million pounds. Landings re up sharply in the Gulf area but the gain s partially offset by reduced production ng the Atlantic Coast.

Shrimp: Landings in the South Atlantic Gulf States from January through July reased from 86 million pounds in 1964 to million pounds in 1965--a gain of 18 per- t.

Mackerel: Landings of Pacific mackerel ,000 pounds) and jack mackerel (33 mil- pounds) to August 27 were down 11 mil- pounds and 13 million pounds, respec- ly, compared with the same period in k.

Industrial fish: Landings for the first 7 ths of 1965 in Maine and Massachusetts species used chiefly in the manufacture sh meal and oil totaled 43 million pounds -- ain of 24 million pounds or 130 percent.

S. Fishing Vessels

CUMENTS ISSUED AND NCELLED, JUNE 1965:

During June 1965 a total of 88 vessels of et tons and over was issued first documents as fishing craft as compared with 72 in June 1964. There were 37 documents cancelled for fishing vessels in June 1965 as compared with 31 in June 1964.

U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, June 1965 with Comparisons

Area (Home Port)	June 1965	June 1964	Jan.-June 1965	Jan.-June 1964
	. . . .(Number). . . .			
Issued first documents 2/:				
New England	4	6	17	19
Middle Atlantic	2	-	7	5
Chesapeake	4	5	18	23
South Atlantic	10	4	37	25
Gulf	31	28	144	120
Pacific	37	27	113	80
Great Lakes	-	-	1	1
Hawaii	-	1	-	1
Puerto Rico	-	1	1	1
Total	88	72	338	275
Removed from documentation 3/:				
New England	5	3	23	17
Middle Atlantic	-	3	11	12
Chesapeake	4	1	18	17
South Atlantic	2	4	43	24
Gulf	14	7	54	54
Pacific	10	13	47	82
Great Lakes	1	-	9	9
Hawaii	-	-	2	-
Puerto Rico	1	-	1	-
Total	37	31	208	215

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/There were 10 redocumented vessels in June 1965 previously removed from the records. Vessels issued first documents as fishing craft were built: 63 in 1965; 3 in 1964; 1 in 1962; 2 in 1957; 1 in 1954; and 18 prior to 1949.
3/Includes vessels reported lost, abandoned, forfeited, sold, alien, etc.
Source: Monthly Supplement of Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-August 1, 1965, amounted to 24,618,503 pounds (about 1,172,310 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was an increase of 13.3 percent from the 21,726,482 pounds (about 1,034,600 standard cases) imported during January 1-August 1, 1964.

The quantity of tuna canned in brine which can be imported into the United Stated during the calendar year 1965 at the $12\frac{1}{2}$-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

Virginia

FISHERY LANDINGS, 1964:

Commercial fishery landings in Virginia in 1964 totaled 465.7 million pounds with an ex-vessel value of $24.2 million as compared with 1963 landings of 374.7 million pounds worth $19.1 million. Heavier landings of menhaden accounted for most of the increase in quantity, while a better harvest of oysters and blue crab contributed to the increase in value. Menhaden, blue crab, and oysters, together with alewives and scup, accounted for 93 percent of the 1964 landings.

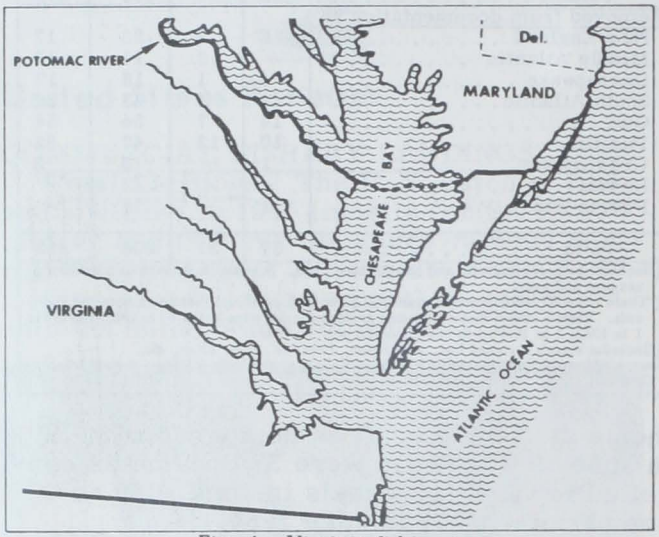


Fig. 1 - Virginia fishing areas.

Virginia's menhaden landings in 1964 totaled 330.2 million pounds with an ex-vessel value of $4.7 million as compared to 255.7 million pounds in 1963 with an ex-vessel value of $3.3 million.

Blue crab landings in 1964 were 52.5 million pounds with an ex-vessel value of $4.1 million--up 11 percent in quantity and 38 percent in value from 1963. The 1964 harvest of market oysters totaled 14.2 million pounds with an ex-vessel value of $10.3 million--up 34 percent in quantity and 27 percent in value from 1963. Hard clam landings in 1964 totaled 2.4 million pounds with an ex-vessel value of $1.2 million, compared to 2.1 million pounds worth $1.0 million in 1963.

The leading food finfish items landed in 1964 were alewives 26.6 million pounds, scup 10.9 million pounds, swellfish 4.3 million pounds, sea bass 3.8 million pounds, spot 3.2 million pounds, and shad 2.6 million pounds. Other finfish landings topping the million-pound mark were flounder (mostly fluke), butterfish, striped bass, catfish, sea trout, and shark or steakfish.

Fig. 2 - Fishing craft docked at Hampton, Va. On the left are 2 oyster dredgers; in the center, 2 draggers; and on the extreme right, 2 crab boats.

Swordfish landings in 1964 increased to 635,400 pounds worth $207,900 ex-vessel. Nevertheless, expectations that Virginia ports would become swordfish centers were not realized. The great majority of the swordfish catches on southern grounds were landed elsewhere. Virginia vessels did not participate in the swordfish fishery in 1964.

The leading fishing area in Virginia in 1964 was Chesapeake Bay with landings of 322.2 million pounds, followed by the Atlantic area with 76.3 million pounds, Chesapeake Bay tributaries with 41.4 million pounds, and the Potomac River with 25.8 million pounds. Landings by area in 1963 were Chesapeake Bay 268.6 million pounds, Atlantic Ocean 54.5 million pounds, Chesapeake Bay tributaries 30.4 million pounds, and Potomac River 20.7 million pounds.

Washington

FISH FARMING PROGRAM FOR SALMON EVALUATED:

The fish farm program in the State of Washington will be upgraded and consolidated during the next 2 years by the elimination of a number of the poorer areas, according to the State Fisheries Director.

The decision was prompted by an economic evaluation completed in 1965 of the success of rearing coho (silver) salmon in fish farms. The study estimated that in the overall there has been only 14 cents benefit in salmon production for each tax dollar spent. The study is the culmination of intensive sampling and evaluation over the past two years.

...h farming of salmon would continue to be ...seful tool in fish propagation, but at this ...age of development can not assume the ma... role, the Fisheries Director said. Efforts ...will be continued to reduce costs and increase production in salmon rearing to assure the greatest catch possible for the money, he added. (Department of Fisheries, Olympia, August 18, 1965.)

* * * * *

NEW FEE SCHEDULE FOR COMMERCIAL FISHING LICENSES:

Washington State commercial fishermen will not be required to have a personal fishing license after August 6, 1965, announced the Director of the Washington State Department of Fisheries on July 28, 1965.

The new fee schedule for commercial fishing licenses became effective on August 6--90 days after passage by the 1965 Legislature of the new schedule. The new gear license fees were increased to include personal licenses for all crew members, so after that date it will not be necessary for each commercial fisherman to have an individual fishing license.

For 1965, all commercial salmon fishing gear licenses had to be obtained by February 1. For 1966 the deadline will be April 1. It was emphasized that these licenses are for commercial fishing only. In Washington State there is no license required for any personal use (sport) fishing for food fish, although salmon fishermen must have a salmon punch card which is free and nonlimiting. (Department of Fisheries, Olympia, July 28, 1965.)

Wholesale Prices

WHOLESALE FISH AND SHELLFISH, AUGUST 1965:

Prices for fresh and frozen fish in August 1965 were higher than the normal seasonal summer pattern. At 114.3 percent of the 1957-59 average, the wholesale index for edible fishery products (fresh, frozen, and canned) rose 4.1 percent from the previous month. Compared with August 1964, the overall index this August was up 8.4 percent. August 1965 prices generally ranged from high-to-sharply higher than in the same month a year earlier.

Prices for all items in the subgroup for drawn, dressed, or whole finfish rose from July to August, with the index up 12.1 percent. There was a steep price increase at Boston for ex-vessel large haddock (up 61.6 percent) because of very light landings. At New York City, prices were up 12.0 percent for Great Lakes round yellow pike, 1.4 percent for western fresh salmon, and 1.0 percent for western fresh halibut. Chicago prices for Lake Superior fresh whitefish were up 8.6 percent from the previous month. As compared with August 1964, the subgroup index this August was up 16.4 percent. Except for salmon, all other prices in the subgroup were sharply higher than a year earlier--up 77.3 percent for ex-vessel haddock, 29.6 percent for yellow pike, 21.8 percent for halibut, and 21.1 percent for whitefish.

Loading foreign ship with steel-strapped overseas-packaged canned salmon at Port of Seattle Salmon Terminals.

The August 1965 fresh processed fish and shellfish subgroup was up slightly (0.2 percent) from the previous month solely because of the 2.5 percent price increase at Boston for fresh haddock fillets. Compared with the same month a year earlier, most prices this August were substantially higher and the index was up by 7.6 percent. Prices were up 15.5 percent for fresh haddock fillets and 12.5 percent for South Atlantic fresh shrimp at New York City. Prices at Norfolk for standard shucked oysters, while unchanged June-August 1965, were up 1.9 percent from August 1964.

The subgroup index for frozen processed fish and shellfish dropped 0.9 percent from July to August. Higher prices for frozen flounder and haddock fillets were more than

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1965 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			August 1965	July 1965	August 1965	July 1965	June 1965	August 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					114.3	109.8	108.9	105.4
Fresh & Frozen Fishery Products:					117.4	112.8	111.5	106.9
Drawn, Dressed, or Whole Finfish:					133.4	119.0	113.3	114.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.19	.12	147.7	91.4	88.2	83.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.51	.50	149.4	147.9	129.4	122.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.91	.90	127.5	125.8	121.4	129.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.64	.59	94.8	87.3	91.8	78.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.70	.63	114.6	102.3	90.1	88.4
Processed, Fresh (Fish & Shellfish):					108.8	108.6	109.6	101.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.40	99.6	97.2	86.2	86.2
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.86	.86	100.8	100.8	104.3	89.6
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.2	120.2	120.2	118.0
Processed, Frozen (Fish & Shellfish):					104.8	105.7	106.6	100.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.8	97.6	98.8	95.0
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.37	111.4	108.5	108.5	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.32	108.7	112.2	105.2	106.9
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.85	.88	100.8	103.7	105.5	94.9
Canned Fishery Products:					109.4	104.9	104.9	103.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	22.00	106.8	95.9	95.9	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	119.4

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

offset by lower prices at Boston for ocean perch fillets (down 3.1 percent) and at Chicago for frozen shrimp (down 2.8 percent). But prices this August were higher for all items than in the same month of 1964, with the subgroup index up 4.8 percent.

The one and only change in August 1965 prices for canned fishery products was in canned pink salmon--up 11.4 percent from the previous month. The subgroup index was up 4.3 percent from the previous month. The stronger market for canned salmon was due to marked improvement in movement of the previous season's stocks and also because of the failure of the 1965 pink salmon run. T ward the end of August 1965 the new pack pink salmon was less than half that packe the same time a year earlier. Prices for canned Maine sardines were unchanged fr July to August--the new season pack pick up substantially by the end of August when was about double that for the same period 1964. Canned fish prices this August wer higher than in the same month a year ear and the index was up 6.1 percent. Prices were up 10.1 percent for pink salmon, 14. percent for California jack mackerel, and 10.1 percent for Maine sardines. There w no change in canned tuna prices.