TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

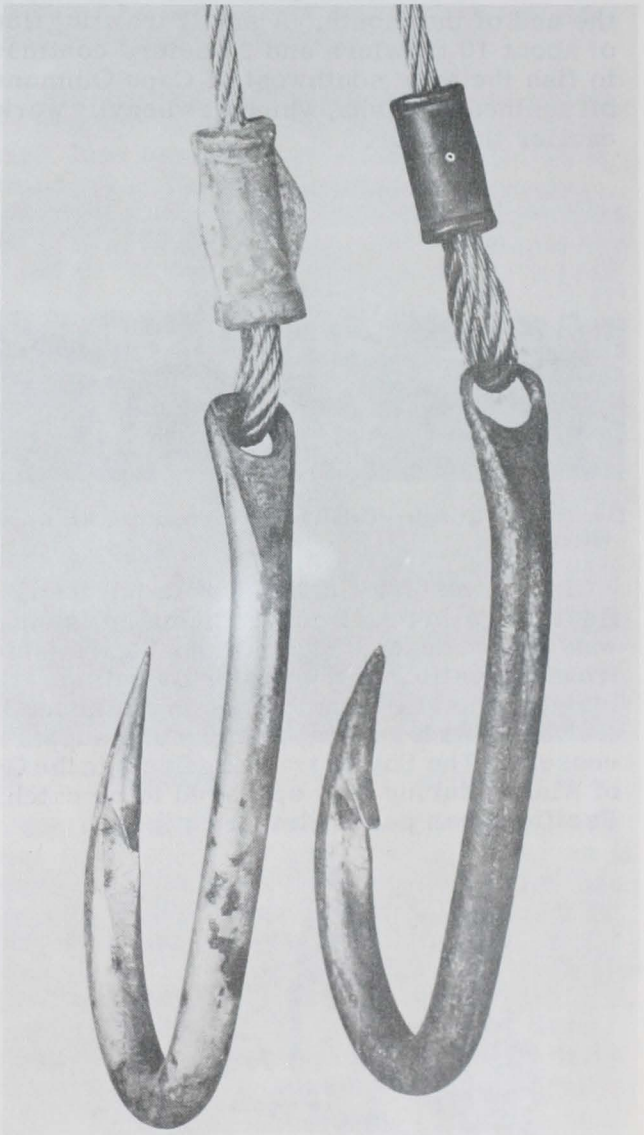
EQUIPMENT NOTE NO. 17--
LONG-LINE GEAR IMPROVEMENT -
ALUMINUM CRIMPING SLEEVE PREVENTS
HOOK DAMAGE BY ELECTROLYSIS:

Extensive hook deterioration and loss caused by electrolysis has plagued swordfish fishing efforts in the new Atlantic Ocean long-line fishery off the east coast of the United States. Copper and zinc-plated copper crimping sleeves have been used to secure hooks to leaders of stainless steel or galvanized wire cable. Contact of the dissimilar metals--zinc, copper and steel--in an electrolyte (sea water) forms a galvanic cell (battery) which produces an electric current. This current electrolyzes (dissolves or corrodes) the eye of the hooks (figure). On one occasion long-line gear with many new hooks was lost and retrieved four days later. Most of the hooks had become badly corroded with the eyes nearly destroyed. Hooks, weakened in this way, frequently result in the loss of hooked fish.

These observations indicated a leader and hook assembly should incorporate a crimping sleeve of a more active metal than copper in order to eliminate electrolytic damage to the hook. An aluminum alloy sleeve was tested by an American fisherman during 1963. After 9 months and 76 long-line sets the test hooks showed only slight deterioration. Only the aluminum sleeves were badly corroded and required replacement. The previous assembly, using a copper sleeve, required hook replacement after about 30 long-line sets.

The substitution of aluminum for copper as a sleeve material has minimized hook deterioration and fish loss, and reduced assembly costs since the cost of aluminum sleeves is approximately 25 percent less than that of copper.

--By Peter C. Wilson, Fishery Biologist (General),
Exploratory Fishing Base,
U. S. Bureau of Commercial Fisheries,
Gloucester, Mass.



The hook on the right is secured to the stainless steel leader with a copper sleeve. Note that the hook has deteriorated from electrolysis. The hook on the left is secured with an aluminum sleeve. Both hooks were used the same length of time in salt water (approximately six weeks).

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 740

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, MAY 1965:

U.S.S.R.: The central Gulf of Alaska became the scene of major Soviet trawling efforts during May 1965. More than 100 Soviet trawlers, 20 reefers, and various support vessels were dispersed generally along the 100-fathom curve from Cape Spencer north and west to Portlock Bank east of Kodiak by the end of the month. A small trawling fleet of about 10 trawlers and 2 reefers continued to fish the area southwest of Cape Ommaney off southeast Alaska, which was heavily worked earlier this year.

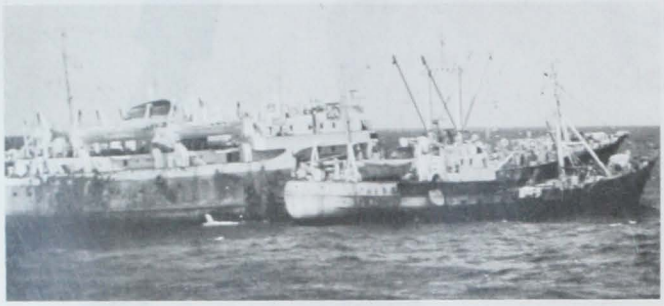


Fig. 1 - SRT-R trawler off-loading Pacific ocean perch to a Soviet reefer vessel.

In the western Gulf of Alaska the trawling fleet operating east of the Shumagin Islands was also reduced. Many of the BMRT factory trawlers shifted to the western Aleutians area, leaving a fleet estimated to contain about 12 trawlers, with several reefers and support vessels. The Soviet trawling fleets in the Gulf of Alaska during May appeared to be catching Pacific ocean perch almost entirely.

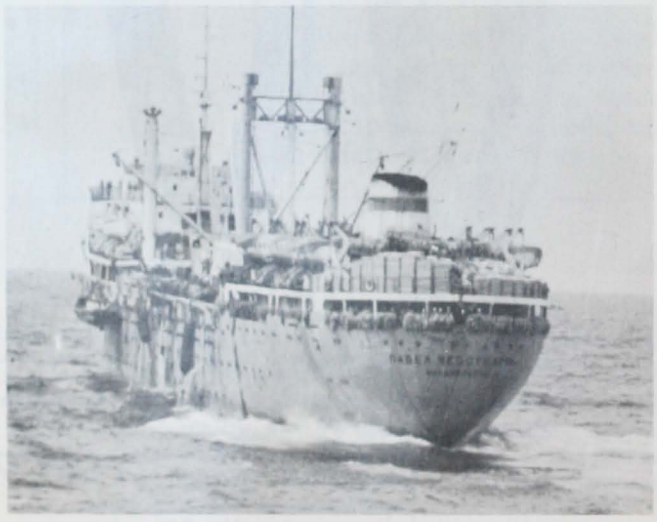


Fig. 2 - Soviet king crab factoryship.

At least 4 Soviet SRT-M trawlers were fishing for shrimp in the Gulf of Alaska duri the month. Most of their fishing was in the Kodiak area until early May when the SRT-M shifted to the area east of the Shumagin Island Observations were that their catches of shr were substantial in that region. Three of th SRT-M trawlers, previously associated wit shrimp fishing, were seen working among the ocean perch fleets in the central Gulf.

A sizable Soviet trawling fleet developed the western Aleutians in the general vicinity of Attu Island. About 20 trawlers, including about 10 BMRT factory trawlers, were engaged in the Pacific ocean perch fishery ther which Soviet sources have reported highly successful.

The 3 Soviet king crab factoryships, acco panied by about 9 tangle-net handling SRT traw ers, operated in outer Bristol Bay about 80 miles northwest of Port Moller throughout May.

Soviet whale killer vessels believed to be assigned to the factoryship Aleut were sighte about mid-month near Atka Island in the central Aleutians. Additional whaling fleets wer expected, for in past years the Soviets have operated 3 or 4 such fleets off Alaska.

Early in May the Soviet refrigerated fis transport Churkin was granted permission t enter the harbor at Kodiak to deliver a crew member requiring emergency medical treatment. The U. S. boarding party reported the Churkin was equipped to receive fresh fish a well as frozen blocks of fish. The master o the vessel said they were not taking salmon but only small fish and indicated an ocean perch size fish with his hands.

Japan: Three Japanese factoryships were engaged in fish meal and oil production off Alaska during May. The vessels Gyokuei Ma (accompanied by 26 trawlers), Hoyo Maru (wi 29 trawlers), and Tenyo Maru (with 10 trawlers) operated in outer Bristol Bay about 80 miles north of Unimak Pass. In addition to meal and oil production, the Tenyo Maru fleet reportedly would fish primarily for Alaska pollock for conversion into minced fish meat (used as an ingredient for fish cakes and fish sausage).

The Japanese shrimp factoryship Einen Maru, with 15 trawlers, remained during May on the proven shrimp fishing grounds about 6

iles northwest of the Pribilof Islands. The cond Japanese factoryship (Chichibu Maru) portedly licensed for shrimp fishing was rded by a United States party north of the bilofs. The Japanese said their main ob- ctive this year would be freezing Pacific o- n perch and flatfish. That vessel still has shrimp-peeling machines installed aboard. out mid-month the Chichibu Maru and her trawlers moved to the western Aleutians rth of the Rat Islands and were observed hing perch.

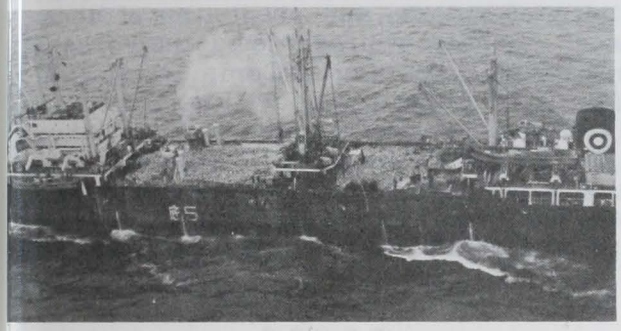


Fig. 3 - Gyokuei Maru, Japanese fish meal factoryship.

King crab fishing by the Japanese factory- ips Tokei Maru and Tainichi Maru and 10 ngle-net handling trawlers was concentrated outer Bristol Bay about 80 miles northwest Port Moller. The Japanese king crab fleets ve often been sighted working the same ounds as their Soviet counterparts.

Fig. 4 - Japanese shrimp factoryship Einen Maru.

At least 4 factory stern trawlers and about smaller side trawlers were believed to be shing in the western Aleutians area primari- for Pacific ocean perch during May. In the rea between Unimak Pass and the Pribilof slands, 2 other Japanese factory trawlers ere operating.

In the Gulf of Alaska, the Japanese factory tern trawler Taiyo Maru No. 82 fished mainly n Portlock Bank east of Kodiak Island, the aishin Maru No. 12 alternated between Port- ck Bank and Albatross Bank off southwest odiak, and the Akebono Maru No. 53 worked

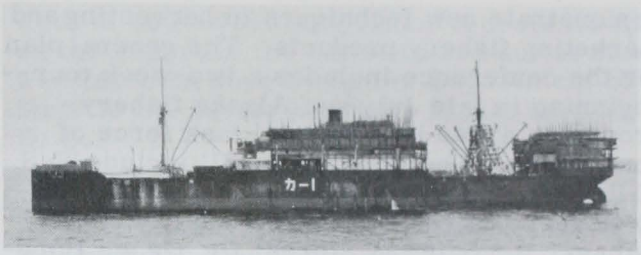


Fig. 5 - Japanese crab factoryship Tokei Maru.

between Chirikof Island and the Shumagin Islands southwest of Kodiak.

Long-line fishing by the Japanese continued at a low level during May, with only one small fleet operating off Alaska. That fleet, composed of the fishing-processing vessel Kotoshiro Maru, accompanied by 3 long-liners, was last reported fishing near Semisopochnoi Island in the western Aleutians. So far in 1965,

Fig. 6 - Processing crab meat aboard a Japanese factoryship.

6 Japanese vessels were sighted fishing long lines in the Gulf of Alaska which, as far as is known, are not licensed by the Japanese Fishery Agency to operate in the Gulf area. It is believed those vessels were operating independently rather than belonging to a fleet. Detailed observations of those vessels and U. S. boardings of two of them showed they were taking mainly sablefish. No salmon or halibut were observed aboard the long-liners.

* * * * *

FISHING INDUSTRY MODERNIZATION CONFERENCE PLANNED:

A fishing industry modernization conference to be held in Alaska during summer 1965 has been planned by Alaska's Governor Egan. The prime objective will be to pinpoint areas of needed change and plan pilot projects to

demonstrate new techniques in harvesting and marketing fishery products. The general plan for the conference includes a two-week tour--beginning in late July--of Alaska fishery-producing areas by a special task force of consultants. The task force will include W. S. Miller, an economic development consultant on Governor Egan's staff; the quality control manager for Safeway stores; Dr. Georg Borgstrom, food scientist from Michigan State University; a food-processing engineer from Portland, Oreg., and a representative from the National Canners Association. Two members of the U.S. Bureau of Commercial Fisheries will serve as technical advisors to the conference. Personnel from the Bureau's regional office at Juneau will accompany the task force throughout the tour and also join the group for the final conference in Anchorage.

* * * * *

NEW FLOATING SHRIMP CANNERY:

The vessel Pacific Pearl, converted from the former 175-foot Coast Guard buoy tender Hemlock, left Seattle under tow the latter part of May to operate as a floating shrimp cannery in Kodiak, and replace one lost at Seldovia in the March 1964 earthquake. According to a spokesman for the owners, this is the first vessel of her kind in Alaska.

Engineroom machinery and other gear were removed from the vessel so as to provide maximum working space. It will be able to handle 500 cases (24 cans each) of shrimp an eight-hour shift, and employ 30 to 40 at peak periods. Operations were to shift to king crab in mid-summer. The cost of the conversion was reported to be $350,000.

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YUKON RIVER SALMON SMOLT OUTMIGRATION CHRONOLOGY STUDY:

The Branch of River Basin Studies, U.S. Bureau of Sport Fisheries and Wildlife, completed its first month of salmon smolt outmigration sampling in the Yukon River for the 1965 season. Fyke nets, scoop traps, minnow traps, and a tow net took whitefish, burbot, lamprey, and suckers, but no salmon were caught until May 26 when the first chum salmon smolt appeared. The work was conducted in open leads in the river and in open water prior to and during the breakup period.

* * * * *

RED SALMON WORKSHOP HELD:

Fishery scientists from California to Alaska attended the interagency red salmon workshop held for 3 days in Juneau under the sponsorship of the Auke Bay Biological Laboratory, U.S. Bureau of Commercial Fisheries. The workshop brought the scientists up-to-date and defined the current status of red salmon research and problems. Discussions covered all aspects of the red salmon life cycle and included such subjects as basic ecology, physiology, manipulation of the environment, cyclic phenomena, distributions of stocks, and prediction of abundance. Agencies represented at the workshop were the U. S. Bureau of Commercial Fisheries, U. S. Bureau of Sport Fisheries and Wildlife, Alaska Department of Fish and Game, Fisheries Research Institute of the University of Washington, Fisheries Research Board of Canada, Canadian Department of Fisheries, and the International Pacific Salmon Fisheries Commission.

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JAPANESE GROUNDFISH CATCHES IN GULF OF ALASKA:

An observer from the Bureau's Auke Bay Biological Laboratory returned to his station after nearly a month's work aboard the Japanese stern trawler Takachiko Maru in the Gulf of Alaska. Principal areas fished by the vessel were Unalaska (248,844 pounds of fish taken) and the Shumagins (30,847 pounds of fish taken). Of 253 hauls, all but 3 were for groundfish. Groundfish hauls averaged about 5.3 metric tons, with the bulk of the catch Pacific ocean perch and sablefish. Another observer completed monitoring of the stern trawler Daishin Maru No. 12 and was scheduled to return to Auke Bay in early June.

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KODIAK CRAB TAG RETURNS:

Tag returns from king crabs in the Kodiak Island area were less numerous during May 1965 than during prior months (23 tag returns during May compared to 267 in April). This was expected because fishing intensity decreases during the molting and spawning periods of king crab. Fishing intensity was expected to remain at a low level until about mid-July.

* * * * *

AUKE BAY PINK SHRIMP GROWTH RATE:

Pot fishing for shrimp in Auke Bay was continued through May 1965. Samples showed that Auke Bay pink shrimp (Pandalus borealis) reach a carapace length of 8 to 9 millimeters (0.32 to 0.35 inches) at one year, and 13.5 to 14.5 millimeters (about 0.51 to 0.55 inches) at two years. This early growth rate is comparable with that in lower Kachemak Bay.

* * * * *

NEW PESTICIDES PROGRAM STARTED:

A new pesticides monitoring program was begun in May 1965 as part of the U. S. Bureau of Commercial Fisheries' nationwide program coordinated through the Gulf Breeze Laboratory. Plans were completed for collecting fish from representative areas throughout Alaska. Initially, fish are to be tested for DDT contamination by the Wisconsin Alumni Research Foundation. Later, the Gulf Breeze Laboratory may do the analyses.

Plans were made for cooperative field and laboratory studies by the Bureau's Auke Bay Biological Laboratory and Northern Forest Experiment Station of the U. S. Forest Service to develop biological forest pest controls which are harmless to fish and shellfish. Effects of feeding by juvenile coho salmon and small king crab on spruce budworm larvae infected with Bacillus thuringiensis will be determined in the laboratory.

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SOVIET FACTORYSHIP OFF ALASKA VIOLATES U. S.-SOVIET FISHING AGREEMENT:

The U.S. Coast Guard announced in a June 24, 1965, press release that one of its vessels on partol off the Alaskan shore recently discovered Soviet fishing vessels taking king crabs in violation of an agreement signed by the United States and the Soviet Union this year.

The Coast Guard said that its cutter Storis, on patrol off Alaska June 21, saw the Soviet factoryship Konstantin Sukhanov, with 7 fishing boats in the water, taking king crab from 40 fathoms approximately 25 miles south of Unimak Island, Alaska. This is outside the area agreed upon for Soviet king crab fishing in an agreement signed February 5, 1965. The agreement provides for Soviet king crab fishing on the Continental Shelf of the United States in the part of the eastern Bering Sea west of 160° West Longitude. A protest based on the report of the Coast Guard cutter Storis was made on June 24 by the Department of State to the Soviet Embassy in Washington, D. C.

The report of the cutter Storis said that its preliminary attempts to make radio contact with the Soviet factoryship were unsuccessful. Late in the afternoon of June 22 the Konstantin Sukhanov picked up all her catcher boats and proceeded into the Bering Sea through Unimak Pass. The Storis using international signals advised the Soviet vessel that fishing for king crab was only permitted in the eastern Bering Sea. The Konstantin Sukhanov using international signals replied, "fishing for king crabs proceeding in eastern Bering Sea." (U. S. Coast Guard press release, Washington, D. C., June 24, 1965.)

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PLANS FOR JOINT JAPANESE-UNITED STATES FIRM TO PROCESS FISH IN ALASKA:

On May 20, 1965, the Governor of Alaska announced that preliminary negotiations had been completed for the joint operation of a fish-processing plant on Prince William Sound by Japanese-United States interests, beginning in the fall of 1965. Involved are a United States fishery firm with headquarters in Seattle, Wash., and two large Japanese firms.

The Governor of Alaska hailed the plan as "a most important milestone in Alaska's economic growth." But he pointed out, "It should be clearly understood that this venture does not mean any lessening of our desire to stop the Japanese from catching our North American salmon on the high seas."

Plans for the joint company were summarized in the Japanese periodical Nihon Keizai on May 22, 1965, as follows:

The joint firm will operate an existing cannery at Orca on Prince William Sound. The Orca cannery is said to have the capacity to produce 200,000 standard cases of salmon during the summer fishing season. The joint company would market its canned salmon pack in the United States, while shipping salmon eggs to Japan. The company might also ship to Japan frozen chum salmon. That species is in demand on the Japanese salt-fish market. In addition, the com-

pany might expand the Orca operation to process crab, herring, and other fishery products. Export sales to Europe have also been mentioned.

The periodical Nihon Keizai in addition reported that, entirely separate from the group involved at Orca, another large Japanese fishing company was working on plans to enter the Alaska canned salmon industry. (United States Embassy, Tokyo, May 27, 1965.)

Alaska Fisheries Explorations and Gear Development

LARGE ROCKFISH POTENTIAL SEEN OFF SOUTHEAST ALASKA:

More than 23,000 pounds of rockfish were brought up in a single 1-hour tow during explorations off southeast Alaska in May 1965 by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. The 86-foot vessel was making a survey of trawlable grounds and abundance of bottomfish resources about 30 miles off Prince of Wales Island.

The large rockfish catch was made with a standard commercial-type otter trawl commonly used by West Coast fishermen, but the size of the catch was comparable to the hauls made by the large foreign vessels operating off Alaska's coast.

The entire catch was used for animal feeding experiments by the U. S. Department of Agriculture's experimental fur farm at Petersburg, Alaska. About 90 percent was black rockfish with the remainder mostly Pacific ocean perch and widow rockfish.

American Fisheries Advisory Committee

INTERIOR SECRETARY APPOINTS TWO NEW MEMBERS TO FILL VACANCIES:

The appointment of W. O. Smith, Ketchikan, Alaska, and Clifton D. Day, San Francisco, Calif., to the American Fisheries Advisory Committee, was announced on June 22, 1965, by Secretary of the Interior Stewart L. Udall. The Committee, established in 1955 under provisions of the Saltonstall-Kennedy Act, advises the Secretary of the Interior on general commercial fisheries matters. It is composed of 20 key fishing industry representatives from various sections of the Nation.

Smith has lived in Alaska since the early 1930's, and in Ketchikan since the mid-194[illegible] where he has been a high-line commercial salmon troller and has represented the salm[illegible] on trollers in union matters. He was elected to the Alaska Constitutional Convention and served two terms as State Senator from 195[illegible] 1965. He replaces Chris Dahl, Petersburg, Alaska, who retired from the Committee after serving since 1955.

Day has been in the fish-canning business for 29 years, and in 1960 was elected Vice President of Alaska Packers Association. He was an advisor to the United States delegation at the second Japan-United States Tuna Conference in Tokyo in 1962, is an advisor to the Pacific Marine Fisheries Commission, and a member of the Fishery Products Committee of the National Canners Association. He replaces Arthur H. Mendonca, also of San Francisco, who retired from the Committee after serving since 1955.

American Samoa

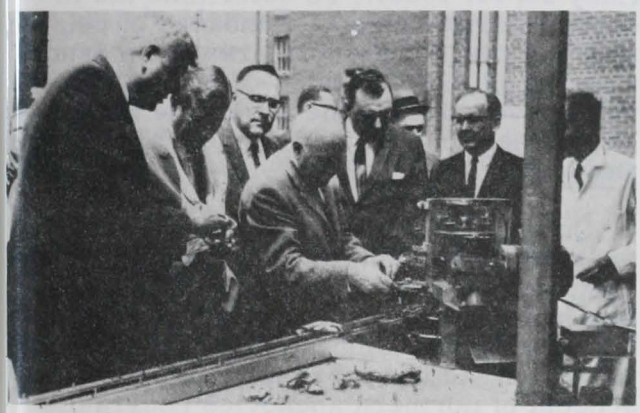
REJECTIONS OF BIG-EYED TUNA DELIVERIES REPORTED HIGH:

Big-eyed tuna deliveries to American Samoa were being rejected at a very high rate in months preceding June 1965, according to the report filed by the Japan Export Trade Promotion Organization's (JETRO) fishery representative in Samoa. In April, one United States packer on that island rejected, in a number of instances, over 50 percent of the quantity processed for packing and in one instance 100 percent of the processed quantity. The JETRO report attributes this high rate of rejection to stricter inspection standards adopted by the U. S. packing firm. (Suisan Keizai Shimbun, June 3, 1965.)

Blue Crabs

SEMIAUTOMATIC CLEANER-DEBACKER MACHINE DEMONSTRATED:

The operation of a semiautomatic machine for cleaning and debacking blue crabs was demonstrated at Alexandria, Va., in May 1965. It was a special demonstration attended by several members of the House of Representatives Merchant Marine and Fisheries Committee who are from the crab-producing States of Maryland and Virginia.



Operation of new crab cleaning machine being observed by members of the House of Representatives Merchant Marine and Fisheries Committee. Also present are Donald L. McKernan, Director, U.S. Bureau of Commercial Fisheries, and an official of the firm that developed the machine.

The machine, developed under a contract between the Department of the Interior's Bureau of Commercial Fisheries and the American Scientific Corporation, Alexandria, punches through the shell of precooked crabs, exposing a core containing the lump and flake meat. The crab meat is then easily removed from the shell and cartilage. Preliminary tests indicate that the machine eliminates a number of hand-operation steps. It is the first of 4 machines which the Bureau hopes will enable the United States shellfish industry to offset rising labor costs and the loss of skilled labor.

Blue crabs produced along the East and Gulf Coasts now are debacked and cleaned entirely by hand. Development of the new machine is a major breakthrough for the crab industry.

Note: See Commercial Fisheries Review, May 1965 p. 12.

California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 65-A-3-Pelagic Fish (April 19-May 3, 1965): To make an echo-sounder survey of the pelagic species, particularly northern anchovies (Angraulis mordax), Pacific sardines (Sardinops caeruleus), Pacific mackerel (Scomber diego), and jack mackerel (Trachurus symmetricus) was the objective of this cruise by the California Department of Fish and Game research vessel Alaska. The area of investigations was in the waters of southern California from San Diego to Gaviota, extending offshore to Cortes Bank.

This was an experimental cruise to explore a new method of surveying pelagic fish populations. The results obtained with anchovies show this type of survey has excellent possibilities for more comprehensively measuring anchovy density and distribution.

A Precision Depth Recorder (Westrex Mark XV) was operated while the vessel traversed a series of predetermined routes crossing the survey area. The vessel track was plotted every hour and schools detected were recorded on the track. In some areas the same pattern was traversed during both day and night. Schools appearing on the echo-sounder were sampled with a midwater trawl. A Furuno Net-Sonde (Model FNZ-5) wireless depth telemeter was operated with the trawl to obtain fish school depths.

A total of 1,306 miles was traversed on this cruise, and 1,880 schools were detected. Daytime operation accounted for 834 miles and 1,658 schools, while 472 miles and 222 schools were logged at night. The low number of schools recorded at night resulted because the fish scatter and rise to the surface after dark. The resulting echo traces consisted of light scatter with few defined schools.

Northern anchovies accounted for nearly all the fish detected. They were distributed in small schools over a large area of clear blue water south of the northern Channel Islands, and were found almost everywhere in that area out to the offshore limits of the survey (85 miles). Heaviest concentrations were found between San Clemente Island and San Diego, and in the Santa Cruz Basin and Outer Santa Barbara Passage.

Up to 70 schools an hour were detected at a vessel speed of 10 knots. North of the northern Channel Islands and inshore of 50 fathoms, very few schools were present. The Santa Barbara-Port Hueneme area, which is usually the richest in anchovies, was almost completely devoid of fish.

Although it was not possible to measure anchovy school size accurately, the schools were obviously quite small. Visual observation of daytime breezing schools indicated amounts probably not exceeding 1 ton per school. Midwater trawl catches rarely exceeded 100 pounds and echo-sounder traces were much smaller than those recorded on other cruises.

All evidence indicated that the anchovy population was spawning and that the distribution and schooling behavior noted on this cruise are typical during the spawning season. Almost all fish examined were in advanced stages of maturity. Night catches contained numerous running-ripe females which appeared to have been spawning at the time they were caught. In samples which contained spawning fish, 70 to 92 percent of the individuals were males and the smallest ripe female was 113 millimeters (4.4 inches) long. Most fish sampled were adults ranging from 91-165 millimeters (3.6 to 6.5 inches) standard length with a mean of 122 millimeters (4.8 inches). Only 3 percent were smaller than 100 millimeters (3.9 inches).

The schools were distributed between the surface and 40 fathoms, with a great many 10 to 15 fathoms down. Midwater trawl catches consisted primarily of anchovies with occasional individuals of other species, including Pacific hake (Merluccius productus), jack mackerel, lanternfish (family Myctophidae), and squid.

Several night tows were made in one area to check on variability between tows. Those trawls yielded catches of anchovies which varied only slightly in quantity indicating the trawl is fairly reliable for measuring abundance on at least a relative basis.

During the cruise, one gill-net set was made at night in the open sea where anchovies were present. Despite very bad weather, 2 fish were taken. Night light stations in a small area on successive nights produced contrasting results. The first night's work under calm sea conditions was very successful in attracting anchovies. The following night, with a brisk wind and choppy sea prevailing, no fish were attracted.

Sea surface temperatures of 59°-63° F. (15.0°-17.2° C.) prevailed in the survey area. Generally calm weather permitted completion of work scheduled for this cruise.

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

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Airplane Spotting Flight 65-5-Pelagic Fi (May 13-14, 1965): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Santa Cruz to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game's aircraft Cessna "182" N9042T.

On May 13, the first day of the survey, the area from Ventura to the United States-Mexican Border was scouted. The weather was generally poor, with a low cloud cover which severely hampered fish school spotting. Despite the poor visibility, many schools of northern anchovies (Engraulis mordax) were sighted. The largest schools were seen in the San Diego area.

The area from Santa Cruz Point to Santa Monica was scouted the following day. Scouing conditions were good in the immediate inshore waters, but offshore (beyond about mile) a strong wind roiled the surface and fish spotting was not very successful. Anchovy schools were seen at Cayucos and from Coal Oil Point to Santa Monica. They were small schools and often within the su line. Red tide was noted that day at Lopez Point, in Santa Monica Bay, and the Huntington Beach and San Diego areas.

Note: See Commercial Fisheries Review, April 1965 p. 16.

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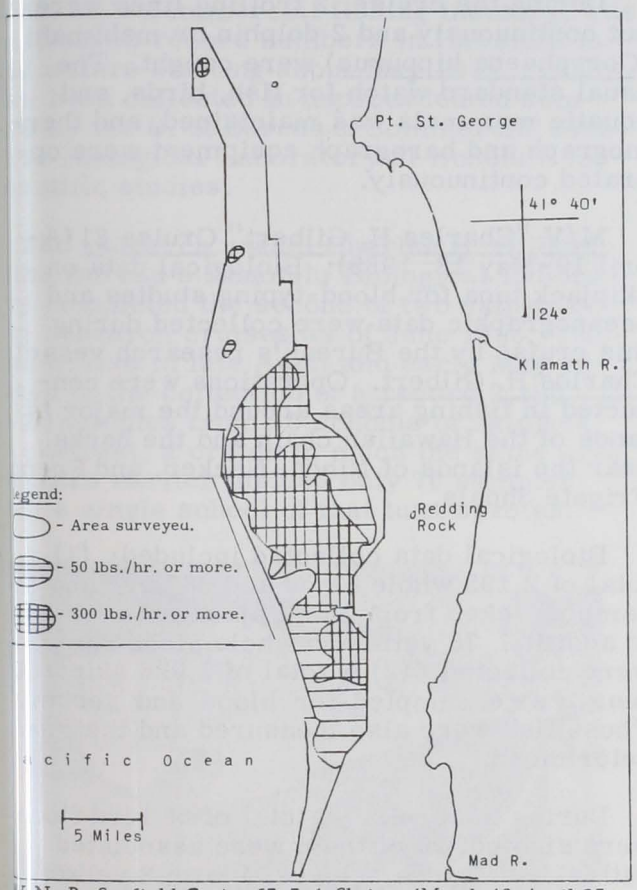
SURVEY OF SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 65-S-1-Shrimp (March 10-April 23, 1965): The objectives of this cruise by the California Department of Fish and Game research vesse N. B. Scofield in coastal waters from the Oregon border to Eureka, Calif., were to: (sample randomly concentrations of ocean shrimp (Pandalus jordani) for determining population estimates and natural mortality rates; (2) determine size, sex, and weight o shrimp; (3) collect stomachs from Pacific hake (Merluccius productus) and arrowtooth

libut (Atheresthes stomias), and examine em for juvenile shrimp; (4) collect gravid male shrimp for rearing at Menlo Park laboratory; (5) collect cephalopods, rare fish, d invertebrates for special collections and e State Fisheries Laboratory, Terminal Island.

Four tows were made off Bodega Bay in an empt to catch gravid females for development studies. Not enough egg-bearing females re caught there so about 80 of them were llected off Crescent City and transported the State's Menlo Park Laboratory by plane.



N. B. Scofield Cruise 65-5-1-Shrimp (March 10-April 25, 65.)

In all, a total of 127 ten-minute tows were de in an area of 278 square miles from Oregon border to Mad River, Calif. Tow- areas were preselected in accordance h a stratified random sampling program signed by the Biostatistics Section, Cali- nia Department of Fish and Game. The r used was a semiballoon, Gulf of Mexico rimp trawl with 41-foot headrope and 1- h stretched mesh. A $\frac{1}{2}$-inch stretched- sh liner was used in the cod end to prevent all 1-year-old shrimp from escaping. shing depths during the cruise ranged from to 100 fathoms.

During the cruise it was found that the shrimp bed in one of the areas worked (Area A) where 50 pounds or more an hour could be taken involved some 152 square miles, and contained an estimated 4 million pounds of shrimp. Commercial concentrations, yielding 300 pounds or more an hour, were found over an area of about 88 square miles. The average catch per hour on this cruise was 366 pounds and ranged from 36 to 1,380 pounds.

The count of shrimp (heads on) per pound ranged from 54 to 262, with a mean of 183. About 28 percent of the females caught were carrying eggs. A few gravid 1-year-old females were observed.

In most cases, fish catches on this cruise were small, with several tows yielding large concentrations of whitebait (Allosmerous elongatus).

A few unusual cephalopods collected on the cruise were sent to the California State Fisheries Laboratory for identification. A total of 101 Pacific hake and arrowtooth halibut stomachs was collected and preserved for examination in the laboratory. Also, several species of flatfish were collected by personnel from the University of California's Institute of Marine Resources for pesticide residue studies.

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

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MARINE SPORT FISH SURVEY OFF SOUTHERN CALIFORNIA:

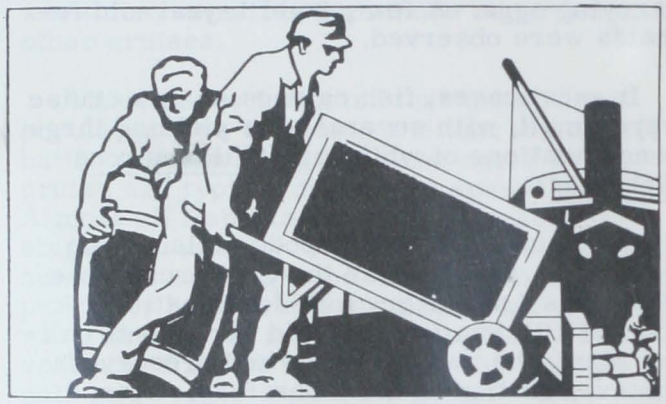
Airplane Survey Flight 65-4 (April 23, 1965): This one-day survey was the first of a series of flights to count the number of poles being fished from the shoreline by sport fishermen, and also count the number of persons attending them, if possible. For this purpose, the southern California coastline between Jalama Beach and the Mexican Border was surveyed from the air by the aircraft Cessna "182" N9042T of the California Department of Fish and Game. The counts made will eventually be used to determine shore-fishing effort in southern California.

The weather was clear and visibility was good throughout the flight. The shoreline between Los Angeles harbor and Jalama Beach was covered earlier in the day. In the afternoon the coastline between Long Beach and the United States-Mexican Boundary was surveyed. The result of the survey was a

count of 64 fishing poles attended by some 54 persons.

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

A total of 592,020 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-March 1965 as compared with 571,307 base boxes used during the same period in 1964.



Larger shipments to the Pacific area accounted for the increase in 1965. The gain was partly offset by lower shipments to the East and South. Following are regional shipments in the first quarter of 1965 and 1964 (reported in base boxes of steel consumed to make cans):

Receiving Area	Jan.-Mar.	
	1965	1964
West	414,000	360,000
East	161,000	187,000
Southern	17,000	24,000
North Central	1/	1/

1/Less than 500.

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. Tonage 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

SKIPJACK TUNA
BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 80 (April 5-12, 1965): To collect various biological data and live tuna and mackerel-like species for behavior studies were the 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 areas of operation were south of Oahu between Kaena Point and Penguin Bank, and not more than 20 miles from shore.

The results of the cruise included the return to the Honolulu Biological Laboratory's Kewalo Basin facility of 64 live skipjack tuna (aku), 3 yellowfin, and 1 little tuna.

During the cruise, 2 trolling lines were out continuously and 2 dolphin or mahimahi (Coryphaena hippurus) were caught. The usual standard watch for fish, birds, and aquatic mammals was maintained, and thermograph and barograph equipment were operated continuously.

M/V "Charles H. Gilbert" Cruise 81 (April 19-May 13, 1965): Biological data on skipjack tuna for blood-typing studies and oceanographic data were collected during this cruise by the Bureau's research vessel Charles H. Gilbert. Operations were conducted in fishing areas around the major islands of the Hawaiian chain and the banks near the islands of Nihoa, Necker, and French Frigate Shoals.

Biological data collected included: (1) a total of 2,195 whole blood and 387 serum samples taken from 15 skipjack tuna schools. In addition, 78 yellowfin whole blood samples were collected. (2) A total of 1,926 skipjack tuna were sampled for blood and serum. Those fish were also measured and their sex determined.

During the cruise, a total of 68 bird flocks were sighted; 29 of them were associated with skipjack tuna schools, 1 with 2 yellowfin schools, 2 mixed schools, and 2 with schools of porpoises. The remaining 34 were unassociated with a particular type of fish school.

A total of 19 yellowfin and 22 little tuna were brought back from Pengiun Banks and Keahole Point, Hawaii, for study under the Bureau's Behavior Program in the bait tanks of the vessel. Tuna-like fish from stomach contents of yellowfin tuna caught off Lanai and samples of bait fish taken off Hanalei Bay, Kauai and French Frigate Shoals were preserved for further study.

Oceanographic operations during the cruise luded taking the usual series of bathyther- grams, sea surface and temperature sam- s, and the release of 620 drift cards.

See Commercial Fisheries Review, June 1965 p. 17.

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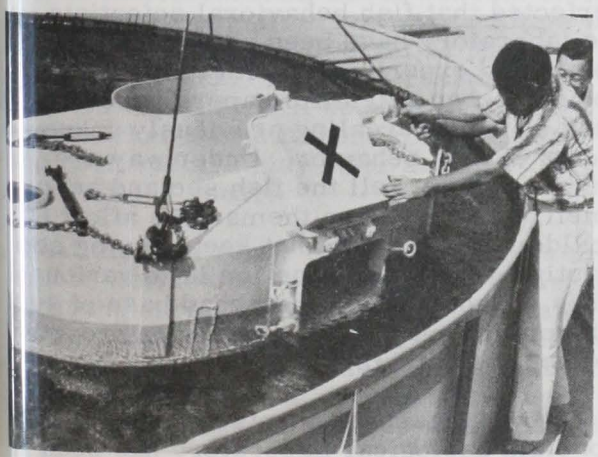
IPJACK TUNA APPEAR
LARGE NUMBERS
OUND HAWAIIAN ISLANDS:

The valuable skipjack tuna (aku), mainstay Hawaii's commercial fishing industry, was ilable in record numbers in Hawaiian Is- d waters starting about May 1965. These re been collected in unprecedented num- rs by the U. S. Bureau of Commercial Fish- ies Biological Laboratory at Honolulu for ientific studies.

The research vessel Charles H. Gilbert the Bureau's Honolulu Biological Labora- y completed the second of two skipjack a research cruises as of June 1965. The st cruise in late April and early May re- ted in the collection of a record 2,195 od samples from 15 schools of skipjack. contrast, a cruise in much the same area months earlier yielded only 70 samples m a single school of that tuna species.



ble tank used to transfer skipjack tuna from vessel to plastic ol at Bureau's Biological Laboratory, Honolulu.

As of early June, the Charles H. Gilbert rned from the second research cruise ing which 184 live skipjack tuna were ght--another record. The vessel also ght 3 little tuna (kawakawa) and 2 yellow- tuna. Those fish were returned to the walo Basin facility of the Honolulu Biolo- al Laboratory. They were handled ac- ding to skillful techniques developed by reau personnel of the Laboratory, the only institution in the world which has been able to keep captive skipjack tuna alive for long periods.

In addition to collecting blood samples, scientists on the research vessel's first cruise took specimens from each school of fish. As is well known to skipjack tuna fishermen, single schools are usually composed of fish of almost identical size. This held true of the specimens collected by the Bureau's research vessel--those from the same school were of the same size.

The blood samples are used in a study of subpopulations of skipjack tuna. Subpopulations are reproductively isolated groups. Many such subpopulations go together to make up the whole population of skipjack in the Pacific Ocean, much the same as populations of the various nations go to make up the whole world population.

The fish taken on the vessel's second cruise are being used primarily for behavior studies at the Laboratory's Kewalo Basin tank complex. Scientists there are studying how well skipjack tuna see and hear, and testing their ability of smell. Other species of fish, notably salmon, have been shown to have acute olfactory senses. Salmon can recognize odors in fantastically low concentrations--one part in 80 billion, or about like a dash of bitters in a swimming pool.

Twenty of the skipjack caught were shipped immediately to Sea Life Park, where they were placed in the large reef tank. Scientists of the U. S. Bureau of Commercial Fisheries will be interested to see if they grow more rapidly or behave differently there than in the smaller plastic swimming pools used at the Bureau's Kewalo Basin facility.

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

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TRANSPORT TECHNIQUES
FOR LIVE TUNA
AIDS BEHAVIOR STUDIES:

Although fishery scientists know a great deal about how fish behave, much of that knowledge rests on experiments conducted with species that have little or no commercial value, with the notable exception of the salmon. The classical experiments in fish behavior have been performed largely on such small fish as the three-spined stickleback. The results, although fascinating and

often extremely valuable in terms of what they disclose about an important element of the animal kingdom, are often not immediately applicable to commercial fisheries.

One difficulty that has beset efforts to conduct systematic experimental studies of the food fish of the open sea, such as the tunas which are the basis of a major United States industry, has been that of maintaining those relatively large and speedy fish in captivity. This difficulty has been solved at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Several times a year the Laboratory's research vessel Charles H. Gilbert noses alongside the dock in Kewalo Basin in Honolulu carrying on her crowded deck a cargo of what look like oversized bathtubs with lids on them. Each contains 5 to 10 live tuna caught only a few hours previously by the vessel's crew of expert fishermen. The fish are caught on a barbless hook. The fisherman swings them over an opening in the lid of the container. Another person steadies the line as the fish is lowered into the container. When tension on the line is relaxed the fish swims free.

The arrival of the Bureau's research vessel is the signal for a crane operator to stand by. Working rapidly, Bureau fishery scientists fit a bridle to the "bathtub" tanks. One at a time, they are lifted from the deck and taken a few yards away to the six 24-foot plastic swimming pools that are part of the Laboratory's complex for fish behavioral research. There the lids are unbolted from the containers. The crane lifts and then lowers the tanks into the sea water-filled swimming pools. Fishery scientists carefully tip them to let their valuable cargo of living tuna swim free.

From the time of catching until they are freed in the pool, the tuna have never been touched. They have spent only a few seconds in the air as they are swung from the sea surface to the tanks. Such methods have had impressive results. The Laboratory's Kewalo Basin facility often has as many as 60 or more tuna waiting their turn for behavior studies. As a result, the Bureau's Honolulu Biological Laboratory has become the only one in the world where live tuna are routinely collected for study. The procedure for handling the fish was worked out by a biologist who has been a member of the Laboratory staff since 1956.

One of the plastic pools used by the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, to keep skipjack tuna alive for behavior studies.

Earlier methods of collecting the fish called for storing them in the vessel's baitwell and then transferring them by hand to the experimental tanks. The fish quickly died. The laboratory biologists then designed and had large iron tanks built. Those proved much more promising, but they were heavy and rusted badly. Reinforced plastic for the lightweight tanks is now used. The plastic has many advantages. Among them is the fact that being translucent, it allows the fish to see where it is going. It is much easier to handle the lighter plastic tanks than the heavy iron tanks.

It is only since methods of handling were perfected that fish behavioral scientists in the laboratory have been able to conduct controlled experiments with tuna. Already about a dozen scientific papers have emerged each of them revealing previously unknown facets of tuna behavior. Under way are studies of how well the fish see and hear and smell, how they keep themselves afloat (tuna would sink if they did not keep moving constantly), what their reaction is to various kinds of food. From the broad base of such information may come new and improved methods of catching tuna.

One of the achievements of the Bureau's Honolulu Biological Laboratory has been its ability to keep skipjack tuna alive for several months. The skipjack, possibly the last great latent tuna resource, is the mainstay of the Hawaiian commercial fishery and is caught in large quantities off the coasts of Japan, and of Mexico and Central America. It has proven to be one of the most difficult fish species to maintain. Skipjack tuna are now kept alive as long as 6 months in the Laboratory's tanks.

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SPECIALLY DESIGNED SONAR SYSTEM FOR LOCATING SUBSURFACE TUNA:

Ocean research scientists are turning to new and powerful tool in their search for hat has been called the last great latent tuna source of the Pacific Ocean--the subsurface tuna. A specially designed frequency-odulated sonar system is being built in California which will be installed on the research ssel Townsend Cromwell of the U. S. Bureau of Commercial Fisheries Biological aboratory, Honolulu, Hawaii, in spring 1966. s installation will allow scientists to observe the behavior of tuna "in their natural ement, the sea, and give us insight into ethods of capture that do not rely on observing surface tuna schools," according to e Bureau Area Director at Honolulu.

Sonar, as its name implies, uses sound r exploration of the undersea world. Sound mitted by the device is reflected by solid jects. The users can then plot the direction and distance of the objects from the vesel. Bureau scientists at the Honolulu Biogical Laboratory say that their sonar will ve a range of almost a mile. At 100 yards will enable them to distinguish between sh no farther apart than 7 inches.

The Laboratory's chief interest, however, not in individual fish, but in schools of fish. he sonar will permit scientists to follow a hool as it swims out of sight beneath the rface of the sea. Previous research has ggested that they will be able to distinguish tween schools of different kinds of fish, ce each species may offer a typical "signture" on the sonar.

That the tuna range throughout the Pacific ean is well known, but schools are rarely en at the surface except fairly near land. at they also spend a part of their lives in e ocean depth is proved by long-line catches hich include big tuna, particularly big-eyed d yellowfin) several hundred feet below the rface.

Of particular interest to the scientists of e Honolulu Biological Laboratory are the pjack tuna. That tuna species forms the instay of the Hawaiian fishing industry. pjack are also caught as small fish off the st coast of the tropical Americas. There evidence that some fish migrate from the stern Pacific to the central Pacific. But pjack schools have not been sighted in the ea between the eastern and central Pacific; they are not seen until some of them are caught in the fishery off the Hawaiian Islands.

Results of the sonar studies are expected to be useful in the design of new types of fishing gear designed to harvest the subsurface tuna.

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OBSERVATIONS ON TUNA RESEARCH:

The following observations were recently made by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, based on its tuna research program:

Albacore Tuna Ecology: Catch rates in terms of numbers of South Pacific albacore tuna caught per 100 hooks did not show any marked trend during 1963 and 1964. On the other hand, the same data, converted into catch in weight per 100 hooks, showed a significant decrease in 1964 when compared to 1963. This was due to a decrease in mean size of fish taken in the fishery. More significant, perhaps, was the decrease in catch per day's fishing (as expressed in weights) in 1963 and 1964 as compared to earlier years (1959-62). There is evidence that this fishery has followed a "normal" course of development, from that of exploiting a relarively virgin stock in which a surplus of older, larger fish had accumulated over the years, to the present stage in which somewhat lower catch rates are obtained because of the earlier removal of the "surplus" fish. Some comparative size data indicate that there were more of the larger fish taken in earlier years.

Tuna Behavior: Visual acuity experiments were conducted with a 5-pound yellowfin tuna. Results coincided with those for a 9-pound yellowfin, although variation in visual acuity with size of fish had been expected.

Working with a 50-centimeter (19.7 inches) yellowfin, a hearing curve for frequencies was obtained ranging between 40 and 1,000 cycles per second. The lower limit was imposed by the instrument used. The upper limit was selected arbitrarily.

On the basis of present knowledge, yellowfin tuna, like other fish, hear best in the frequency range of 300 to 500 cycles per second, and the experiment made bore this out. Sounds within that frequency range occur in the sea. An example is the sound made by swimming

anchovy. The response of tuna to that sound (recorded) will be tested at sea during the summer.

Twice the hydrophone picked up a distinct "snap" sound just as the yellowfin engulfed a piece of food. This was the first time a tuna was heard making a sound other than the splashing that occurs when they break through the surface of the water.

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TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 15 (April 7-30, 1965): The flow pattern for the area investigated during this cruise in the central North Pacific by the research vessel Townsend Cromwell showed changes similar to those observed during a cruise (April 12-May 4, 1964) the year previous. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, on April 30 completed the 14th in a series of oceanographic cruises to determine the rate of change in the distribution of properties in the trade wind zone of the central North Pacific. The area of operations was bounded by latitide 10° N., 27° N. and longitude 148° W., 158° W.

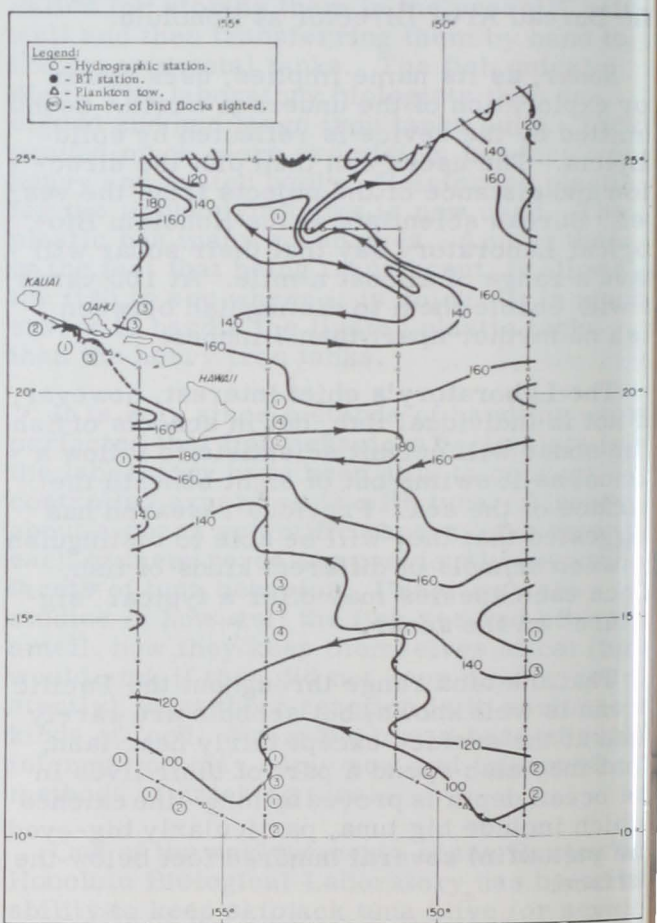
During this cruise it was observed that while the intensity of the westerly flow south of 20° N. was nearly the same as in March 1965, the transport was greater with an overall increase in the depth of the 20° isotherm of about 20 meters (78.7 feet). The flow south of 20° N. had changed from the usual southwesterly to an almost northwesterly set. The random flow to the north of 20° N. was similar to that in March with the large anticlockwise eddy still centered around the same station.

The increase in temperature south of 16° N. which was observed during March 1965 appeared to have ceased with maximum temperatures at slightly over 26° C. (78.8° F.). North of 20° N., cooling had ceased and a rise of nearly 1° C. (1.8° F.) in the minimum temperature occurred.

The samples run at sea showed an increase in salinity in the southern region which may reflect the flushing of the low salinity water present in the months previous to this cruise. The high salinity water of the north had retreated even farther north than had previously been observed.

A total of 43 oceanographic stations was occupied along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). Deep casts to 4,000 meters (13,123 feet) were taken at two stations, and a cast to 5,000 meters (16,404 feet) was taken at one station.

A small increase in the number of bird flocks was observed during the April cruise with 50 flocks in the regular cruise area compared to 43 during March 1965, and 16 in April 1964. Most of the flocks were distributed evenly over the southwest half of the cruise pattern.



Track chart of the research vessel Townsend Cromwell Cruise 15 (April 7-30, 1965), showing depth contours of the 20° C. isotherm in meters.

Other operations during the cruise included taking the usual series of bathythermograms, sea surface temperatures (including the use of a Hytech salinity-temperature-depth in situ recorder), release of drift bottles, and collection of other oceanographic data.

Note: See Commercial Fisheries Review, July 1965 p. 20, August 1964 p. 17.

Clams

CERTAIN POTOMAC RIVER AREAS CLOSED TO SOFT-SHELL HARVESTING:

By an order effective June 19, 1965, the Potomac River Fisheries Commission prohibited soft-shell clam operations in Areas A, C, E, G, J, M, and P of the Potomac. (In addition, soft-shell clam dredging is not allowed upriver above the Charles County-St. Mary's County line.)

Note: For a description of the specified closed areas write to: Potomac River Fisheries Commission, P.O. Box 128, Colonial Beach, Va. 22443.

Columbia River

CLOSURE OF SUMMER SALMON SEASON:

At a public hearing held in Portland, Ore., June 14, 1965, the Washington State Department of Fisheries and the Oregon Fish Commission jointly closed the summer commercial salmon season on the Columbia River until July 29, 1965. Sport fishing for salmon in the Columbia was also closed from June 1 to July 29 by the Washington Fisheries Director. The Oregon Game Commission was expected to take comparable action. (The closures did not affect the shad commercial fishery below Bonneville Dam which was allowed to continue in certain areas from June 5 through July 3.)

Fisheries agencies in Washington and Oregon are concerned about the poor summer runs of chinook and sockeye salmon in the Columbia. Fisheries biologists of both States estimate the total summer runs of the two salmon species will not exceed the bare minimum of 80,000 to 90,000 of each species needed to perpetuate the runs.

Concern was expressed that commercial catchings from the Indian gill-net fishery above Bonneville Dam might reduce the salmon runs below the numbers desired for spawning escapement.

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FEDERAL FUNDS ALLOCATED TO REPAIR FLOOD DAMAGE TO FISHERY FACILITIES:

Under the Columbia River Fishery Development Program, Federal and State agencies in Washington, Idaho, and Oregon are sharing about $996,000 in Federal funds to repair and replace fishery facilities damaged by floods in late 1964 and early 1965. The money is being used to clear the rivers in the Columbia Basin of log jams, remove debris from streams and tributaries, repair damaged fish hatcheries and fish ladders, and replace or repair broken fish screens.

Washington State's $96,000 allotment includes funds for stream clearance and repairs to five fish hatcheries.

The Idaho Department of Fish and Game is receiving $365,000 for stream improvement. The Agency is using the money to remove and clear debris caused by a large log jam on the Salmon River, replace roadways and cofferdams, and repair cave-ins on the Selway Falls fish ladder.

In Oregon, of the $535,000 total fund, $63,500 is allocated to the Oregon Fish Commission for rehabilitation of 5 fish hatcheries, plus $110,000 for stream clearance. The Oregon Game Commission is receiving $61,000 for repair and replacement of approximately 50 screens in the John Day area and 10 in the Walla Walla area. The U. S. Bureau of Commercial Fisheries will use $300,500 of the Oregon allotment to repair Federal installations--Eagle Creek, Little White Salmon, and Willard National Fish hatcheries.

The Eagle Creek National Fish Hatchery and the Cascade Salmon Hatchery were made completely inoperable by the flood. Prompt action by the crews of both stations, who worked on a 24-hour basis using pumps and other temporary aids which they devised, were able to save millions of fish from complete destruction. Emergency pumps were installed and both stations were returned to full capacity within 30 days.

Note: See Commercial Fisheries Review, March 1965 p. 28.

Consumption

U. S. PER CAPITA CONSUMPTION FOR FISHERY PRODUCTS, 1947-65:

The U. S. civilian per capita consumption of fishery products remained unchanged in 1964 at 10.6 pounds (edible weight), the same as in the previous two years. From 1963 to 1964, consumption of fresh and frozen fishery products increased slightly while that for

United States Civilian Per Capita Consumption of Fishery Products (Edible Weight), Selected Years, 1947-65

Type	Preliminary Indications for 1965	1/ 1964	1963	1962	Average 1957-59	Average 1947-49
	(Pounds)					
Fish (edible weight) - Total	10.7	10.6	10.6	10.6	10.5	10.7
Fresh and frozen	3/	5.9	5.7	5.8	5.7	5.9
Canned 2/	3/	4.2	4.4	4.3	4.2	4.2
Cured	3/	.5	.5	.5	.6	.6

1/Preliminary.
2/Excludes canned food products containing small quantities of fish, such as clam chowder.
3/Not available.

canned fish dropped proportionally. The per capita consumption of cured fishery products was unchanged for the years 1962 through 1964.

Preliminary indications for 1965 are that per capita consumption will increase slightly. (National Food Situation, NFS-112, May 1965, U. S. Department of Agriculture.)

Note: See Commercial Fisheries Review, January 1965 p. 25.

Federal Aid for Sport Fish and Wildlife Restoration

INTERIOR APPORTIONS FUNDS TO STATES FOR FY 1966:

Distribution of $15 million in Federal-aid funds for fish and wildlife restoration projects was made to the 50 states on July 1, 1965, announced Secretary of the Interior Stewart L. Udall. This was an increase of $800,000 over a similar distribution a year earlier.

Of the $15 million allocated, $12 million is for wildlife restoration and $3 million is for sport fishery projects. An additional apportionment for fish and wildlife projects will be made in the fall of 1965. The apportionments made in July will enable states with small reserve funds to finance their Federal-aid operations from July 1 until the final apportionment for the year is made in the fall.

Fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment. Under the Federal-aid programs, states spend their own funds on approved projects and are then reimbursed for up to 75 percent of the cost. The laws establishing those programs also provide $10,000 each for Guam, the Commonwealth of Puerto Rico, and the Virgin Islands. The total 1966 fiscal year apportionments for those areas are included in the funds distributed on July 1.

Distribution of the funds is based on the number of paid license holders in a state and the state area. The Federal aid in Fish and Wildlife Restoration programs are administered by Interior's Bureau of Sport Fisheries and Wildlife.

Note: See Commercial Fisheries Review, August 1964 p. 20

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1965:

Fresh and Frozen: Purchases of fresh and frozen fishery products in April 1965 for the use of the Armed Forces were down 11 percent in quantity and 21 percent in value from the previous month. The drop was due mainly to smaller purchases of such high-priced items as shrimp, scallops, and oysters.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1965	1964	1965	1964	1965	1964	1965	1964
(1,000 Lbs.)				($1,000)			
2,029	1,734	8,707	8,524	1,225	903	5,551	4,458

Compared with the same month in 1964, purchases in April 1965 were up 17 percent in quantity and 36 percent in value. Average prices for shrimp, scallops, and Pacific oysters were much higher in April 1965. Purchases in April 1965 were up for shrimp, flounder fillets, ocean perch fillets, and haddock fillets and portions. But purchases were down for scallops and halibut steaks.

Total purchases in January-April 1965 were up 2 percent in quantity and 24 percent in value from those in the same period of 1964. The increase in value was due almost

Table 2 - Principal Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

Product	April				Jan.-Apr.	
	1965		1964		1965	1964
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Quantity
	Pounds	Cents/Pound	Pounds	Cents/Pound	(Pounds)	
imp:						
aw headless	109,000	99	132,600	82	385,800	414,650
eeled and deveined	89,500	143	44,986	108	409,160	276,208
readed	297,600	86	322,000	67	1,227,520	1,301,200
olded and breaded	77,650	66	37,900	58	233,550	152,900
Total shrimp	573,750	95	537,486	73	2,256,030	2,144,958
allops	90,900	76	219,350	52	629,784	910,350
ysters:						
Eastern	39,120	99	24,502	99	246,610	351,420
Pacific	14,912	81	19,314	52	112,564	93,120
Total oysters	54,032	94	43,816	78	359,174	444,540
illets:						
Cod	32,000	34	45,520	30	188,270	172,766
Flounder	246,700	39	141,000	31	1,049,200	1,314,816
Ocean perch	362,250	30	236,100	30	1,370,540	1,247,220
Haddock	138,000	33	99,530	29	593,550	668,774
addock portions	177,000	44	-	-	675,054	8,650
teaks:						
Halibut	52,800	50	116,770	35	375,220	423,795
Salmon	10,960	69	15,675	68	43,700	64,977
Swordfish	500	56	700	51	1,760	6,010

ntirely to the higher prices prevailing in 965. A sharp increase in purchases of had- ock portions was almost offset by smaller urchases of scallops, eastern oysters, lounder fillets, haddock fillets, and halibut teaks.

Canned: Purchases of canned tuna and nned sardines for the Armed Forces in nuary-April 1965 were running consider- ly ahead of the same period in 1964. Pur- ases of canned salmon were light in early 65. (Most canned salmon purchases for e Armed Forces are made in the fall months ter the main canning season ends.)

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, April 1965 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1965	1964	1965	1964	1965	1964	1965	1964
	(1,000 Lbs.)				($1,000)			
na	315	2	2,504	1,459	142	1	1,083	645
non	1	-	9	679	1	-	8	416
kline	70	28	216	107	21	11	110	41

Freeze-Dried: Purchases for the Armed orces in April 1965 included 2,103 pounds freeze-dried shrimp priced at about $12 pound.

tes: (1) Armed Forces installations generally make some local urchases not included in the data given; actual total purchases re higher than shown because data on local purchases are not btainable.

(2) See Commercial Fisheries Review, June 1965 p. 19.

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PALLETIZED UNIT LOADS FOR CANNED TUNA PURCHASES BY THE DEFENSE DEPARTMENT TO BE REQUIRED ON TEST BASIS:

The military services have expressed a strong desire to receive subsistence items in palletized loads whenever possible and practical. As a result, the Defense Subsistence Supply Center announced May 20, 1965, in Headquarters Notice to the Trade No. 54 (65) that a number of items have been selected to be palletized by suppliers on a test basis. Canned tuna is included in the test. Requests for bids on selected quantities of canned tuna will specify the need for palletization.

Palletized unit loads of canned tuna will require full 4-way entry, wing type, 40 inch by 48 inch, seasoned wood pallets. Top and bottom of shipping cases will be glued to each other and to pallets by two narrow strips of glue on each case. The palletized unit load is limited to the overall maximum dimensions of 43 inches in length, 52 inches in width, and 54 inches in height, and to a maximum weight of 2,100 pounds.

The following Military Specifications will be referenced in purchase documents for canned tuna when palletization is required:

(a) MIL-L-0035078A, Loads, Unit: Preparation of Non-Perishable Subsistence In

(b) MIL-P-15011E, Pallets, Material Handling, Hardwood, Post Construction, 4-way

(c) MIL-A-13374B, Adhesive Dextrin

(d) MIL-STD-731, Quality of Wood Members for Containers and Pallets

(e) FF-N-105A - Nails, Wire, Brads, and Staples

Additional information will be available from Regional Offices of the Defense Subsistence Supply Center.

Fish Meal

COMPACT PROCESSING PLANT BUILT BY NORWEGIANS:

Fish meal processors in the United States have shown considerable interest in a compact fish-meal processing plant built in Norway and sold in this country through a New York firm. The Norwegian manufacturers feel there is a ready market for this equipment in the United States.

The Norwegian-built plant has a fish meal production capacity ranging from 10 to 60 tons every 24 hours, and comes in three sizes, each of which is adaptable to ship or shore installation. The plant's operation is essentially the same as that of a menhaden reduction plant. It is possible to add equipment to add the stickwater concentrate into the press cake as it is being dried, thereby utilizing all of the product.

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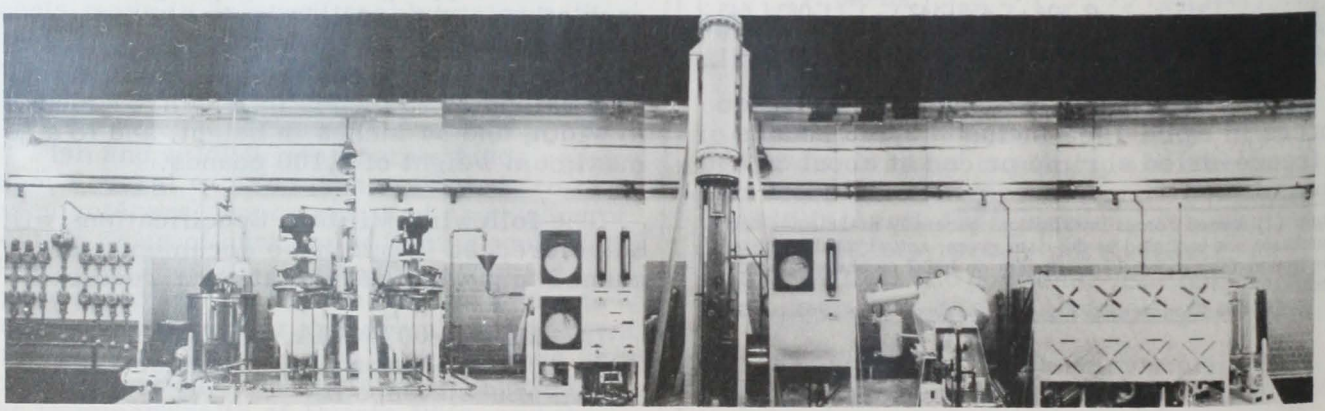
Fish Protein Concentrate

NEW MODEL-SCALE SOLVENT-EXTRACTION PROCESSING UNIT IN OPERATION:

The accelerated Fish Protein Concentrate program of the U. S. Bureau of Commercial Fisheries took another major movement forward in May 1965 when the new model-scale unit for the study of chemical fish protein concentrate-processing methods went into operation. Designed and constructed by the engineering staff of the Battelle Memorial Institute under a Bureau contract, the unit was installed in leased facilities completed about that time at Beltsville, Md., near the Bureau's College Park Technological Laboratory.

The new unit is extremely flexible in that it will permit engineering studies on solvent-extraction procedures using many different kinds of solvents and many different conditions of time, temperature, and quantities of solvent. The operation is essentially a batch operation and has a production rate of about 100 pounds of finished product a day. The installation consists of a mixing tank in which the raw ground fish and the solvent under study are slurried; two extractors; a centrifuge for the separation of liquid and solids; a solvent recovery system; and a vacuum tumbling dryer for the desolventization and final drying of the product. Tanks for solvent storage and for the collection of the dissolved material (miscella) are also provided.

Presently under study is a method for the production of fish protein concentrate from North Atlantic red hake, using isopropyl



Model-scale unit for producing fish protein concentrate by the solvent-extraction process installed in leased building and being operated by the Bureau of Commercial Fisheries technological laboratory, College Park, Md.

Alcohol as a dehydrating and defatting agent. By late summer 1965, a commercially feasible method based on hake and isopropyl alcohol is scheduled to be available, as well as a complete definition of the characteristics of the product from this process and its nutritional value and wholesomeness.

Great Lakes

CHANGES PROPOSED IN COMMERCIAL FISHING REGULATIONS:

Several proposed changes in Great Lakes commercial fishing regulations were tentatively approved in June 1965 by the Conservation Commission of the State of Michigan. One was a recommendation by Michigan's Department of Conservation to close commercial fishing for lake trout in Lake Michigan on or after October 1, 1965.

The proposed restriction on lake trout commercial fishing in Lake Michigan is identical to that which has been in effect for several years in Lake Superior, and is tied to the long-range program to restore lake trout in the upper Great Lakes. The program is designed to protect lake trout populations being built up in Lake Michigan's northern waters, starting with the initial release in June 1965 of 1.2 million yearling fish.

As an exception to the general shutdown on commercial fishing for lake trout in Lake Michigan, a small number of licensed operators will be contracted and permitted to take lake trout so that information can be collected on survival, growth, reproduction, and distribution of planted stocks. As in the case of Lake Superior, those contract commercial fishermen will be limited to a quota each year--a lake trout catch quota carefully calculated to have no adverse effect on planted lake trout populations.

Another Great Lakes commercial fishing change approved by the Michigan Conservation Commission would provide a uniform November 1-30 closed season for taking whitefish in Lakes Huron, Michigan, and Superior. The revised closed season is timed with the peak spawning period for whitefish in all three of those lakes. Whitefish are now off limits to commercial fishermen from October 15 through December 10 in Lakes Michigan and Huron, and from November 1 through November 26 in Lake Superior. Also endorsed by the Commission is a measure which would allow commercial fishermen operating in those three lakes to take lake trout and whitefish with trap and pound nets in any depth of water. The use of such nets is now limited to 80 feet of water or less.

The last set of changes in Great Lakes commercial fishing regulations would lift the closed season and minimum size limit on yellow perch in Lake Erie where those controls are no longer needed.

Except for the lake trout restriction in Lake Michigan, the changes reflect the effort of Michigan's Department of Conservation to liberalize commercial fishing regulations where research findings point up the need and and practicality of doing so. The chief of the Department of Conservation's fish section explained that Michigan's present controls over commercial fishing in the Great Lakes are archaic and that they are the most conservative ones in effect in those waters. He added that many regulations have become outdated by shifts in the fishery of the Great Lakes, and that steps should and will be taken to bring them in line with today's developments.

The measures recently approved by the Michigan Conservation Commission will be discussed at public hearings. They will then go through a series of administrative steps before being brought back to the Commission for final action. (News Bulletin, Michigan Department of Comservation, June 17, 1965.)

* * * * *

LAKE TROUT RESTOCKING PROGRAM IN UPPER LAKES FOR 1965:

Continuing efforts to revive lake trout populations of the upper Great Lakes were to be stepped up in June 1965 with the release of over 3.1 million yearling fish, according to the Great Lakes Fishery Commission. Included in the June stocking schedule were some 1.9 million young fish for Lake Superior where 10 million trout have been planted since state, Federal, and Canadian agencies were coordinated under the Commission to start that phase of restoration work in 1958.

Sparked by the progress of sea lamprey control in tributaries of Lake Michigan, more than 1.2 million yearling lake trout

were to be set free in that lake's upper waters during the early part of June. It will be the first step to restock northern Lake Michigan where sea lamprey are scheduled to come under control by 1967. Because of their small size, fish going into those waters are expected to be safe from lamprey attacks during the next two years before lamprey populations are substantially reduced.

In Lake Superior, where continued good signs are seen of survival and growth among lake trout planted earlier, the June 1965 planting program was scheduled for the release of 900,000 fish in State of Michigan waters. Of that total, 600,000 fish would be released between Keweenaw Bay and Grand Marais. Other plantings along Michigan's shores included 200,000 fish in the Ontonagon area, and another 100,000 in lower Whitefish Bay. Most of the fish were raised from eggs supplied by the State of Michigan Conservation Department's Marquette Hatchery which is providing the bulk of planting stock for the restoration program.

Some 470,000 yearling trout were to be released on the Canadian side of Lake Superior by the Ontario Department of Lands and Forests. Wisconsin and Minnesota were slated to stock their Lake Superior waters with 460,000 and 100,000 fish, respectively.

Lake Michigan plantings included the release of 850,000 trout at three locations between Seul Choix Point and Epoufette. Grand Traverse Bay and the Beaver Islands area would each receive 100,000 small lake trout. Some 200,000 fish were to be stocked off Door Peninsula in Wisconsin waters to round out the 1965 program for Lake Michigan. Planting stock for the entire Lake Michigan operation will be from the Federal Jordan River Valley Hatchery in northern Michigan. (News Bulletin, Michigan Department of Conservation, Lansing, May 27, 1965.)

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

* * * * *

ALEWIFE POPULATION IN LAKE MICHIGAN CONTINUES TO INCREASE:

The alewife population in Lake Michigan is still increasing sharply, with the 1964 hatch of that species nearly 50 times more abundant than in 1962, according to the U. S. Bureau of Commercial Fisheries Regional Office, Ann Arbor, Mich. The alewife, first reported in Lake Michigan in 1952, was not fished commercially prior to 1956. The alewife catch in Lake Michigan in 1964 was about 11.5 million pounds which was more than double the 1963 catch of that species.

Fish meal plants built in Milwaukee and Sturgeon Bay, Wis., in 1964 were expected to enable commercial fishermen to increase alewife production substantially resulting in additional economic benefits and also providing some degree of control over the population explosion of that species which has infiltrated a good part of the western Great Lakes.

The alewife is a native ocean fish species. In its newer habitat of the Great Lakes it seldom exceeds 8.5 inches in length, is quite oily, and very thin. (Great Lakes News Letter, March-April 1965.)

* * * * *

UNITED STATES-CANADIAN COMMERCIAL FISHERY LANDINGS, 1964:

The U. S. Great Lakes commercial fishery catch dropped to a new low in 1964 while Canadian landings that year were the lowest since 1952. The 1964 U. S. landings of 52.9 million pounds (estimated ex-vessel value $5.0 million) were 5 percent lower than in 1963 and the Canadian catch of 34.8 million pounds (ex-vessel value $4.1 million) was about 25 percent less than in 1963. Landings were lower in most of the Great Lakes except Lake Michigan where they increased substantially from the previous year.

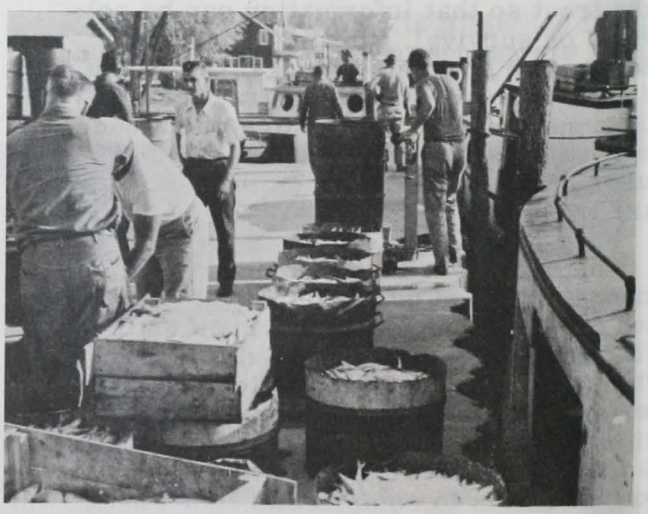


Fig. 1 - Fresh-water fish packed with ice in wooden boxes and tubs.

Lake Michigan's 1964 landings of 25.7 million pounds accounted for nearly half the total U. S. Great Lakes catch. The gain was due to an increase of more than 100 percent in the catch of alewives. Totaling some 11.5 million pounds, that low-value species is used for animal food and fish meal, and accounted for 45 percent of Lake Michigan's 1964 landings. Yellow perch landings were up in 1964 but the chub catch dropped by one-third down to 5 million pounds.

Lake Erie was the most productive of the Great Lakes and in 1964 accounted for a U. S.-Canadian commercial catch of about 38.7 million pounds, a decline of 26 percent or 13.8 million pounds less than in 1963. Lake smelt accounted for half the Canadian 1964 commercial catch in Lake Erie with a total of 12.7 million pounds, while the U. S. catch of that species was less than a half million pounds.

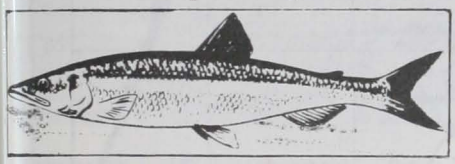


Fig. 2 - Smelt.

In the Lake Huron-Georgian Bay area of the Great Lakes, the 1964 catch of chubs, as the leading commercial species, was lower than the previous year. The overall catch in Ontario waters increased in 1964 and there was a gain in both the Canadian and U. S. catch of yellow perch and whitefish.

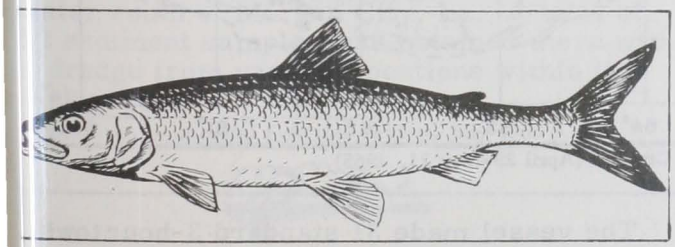


Fig. 3 - Lake herring.

The 1964 landings of herring in Lake Superior--the mainstay of commercial fishing in that lake--were lower than in 1963 but the smelt catch in U. S. waters of that lake increased. In 1964, the lake trout fishery in Lake Superior was again restricted to encourage the recovery of that species but at the same time allowing the continuation of biological studies. The U. S.-Canadian catch of lake trout in 1964 totaled about 219,000 pounds, only slightly more than in 1963. (Great Lakes News Letter, March-April 1965.)

Note: See Commercial Fisheries Review, March 1965 p. 33; October 1964 p. 25.

Gulf Fisheries Explorations and Gear Development

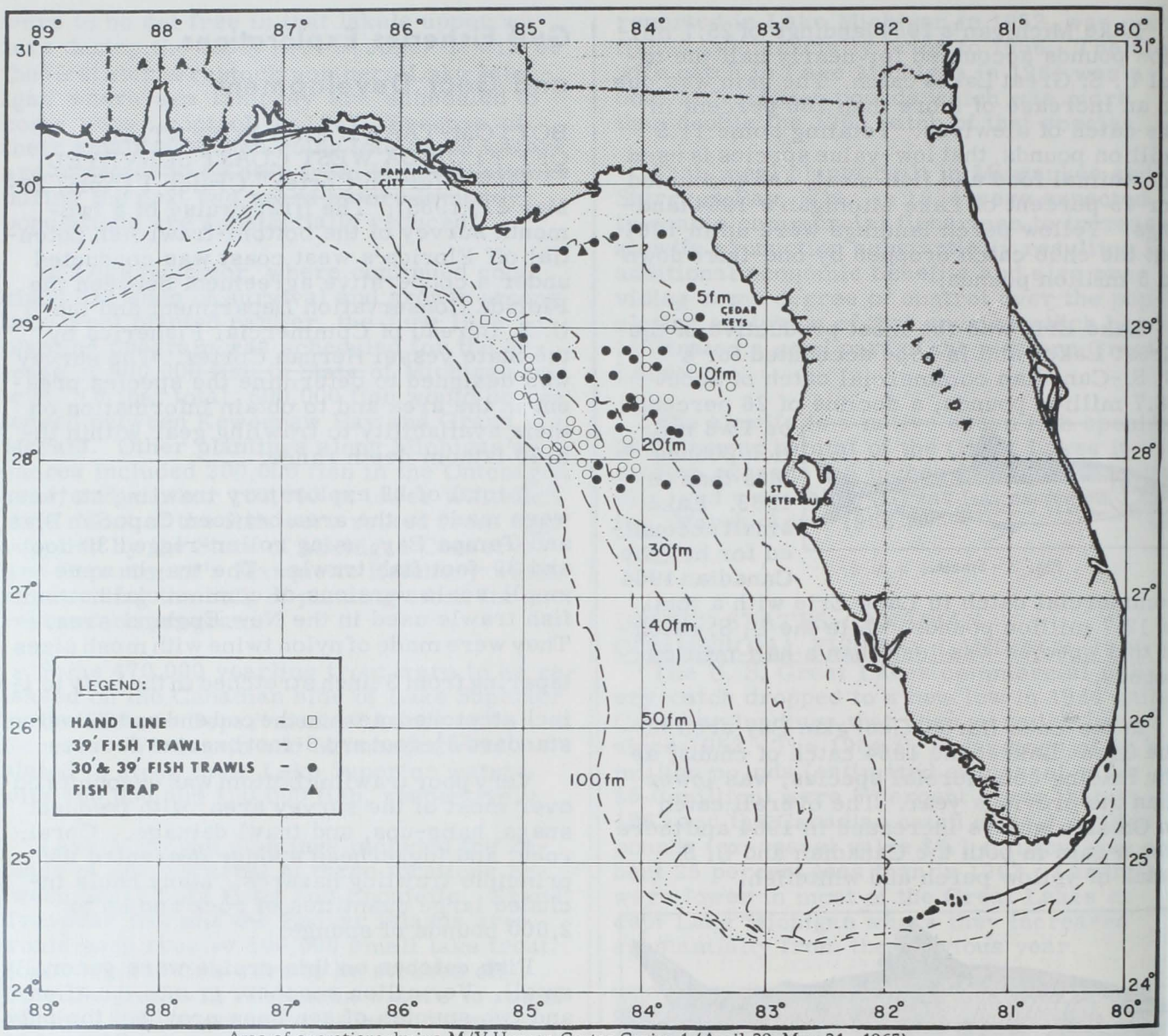
BOTTOM-TRAWL FISH POTENTIAL OFF FLORIDA WEST COAST SURVEYED: M/V "Hernan Cortez" Cruise 1 (April 29-May 21, 1965): The first cruise of a two-month survey of the bottom-trawl fish potential off Florida's west coast was conducted under a cooperative agreement between the Florida Conservation Department and the U. S. Bureau of Commercial Fisheries by the State vessel Hernan Cortez. The survey was designed to determine the species present in the area and to obtain information on their availability to trawling gear within the 5-50 fathom depth range.

A total of 88 exploratory trawling stations were made in the area between Cape San Blas and Tampa Bay, using roller-rigged 30-foot and 39-foot fish trawls. The trawls were small-scale versions of commercial bottom-fish trawls used in the New England area. They were made of nylon twine with mesh sizes tapering from 3-inch stretched in the body to $1\frac{5}{8}$-inch stretched mesh in the cod end and fished on standard $5\frac{1}{2}$-foot and 6-foot bracket doors.

Very poor trawling bottom was encountered over most of the survey area, with frequent snags, hang-ups, and trawl damage. Coral, rock, and loggerhead sponge presented the principle trawling hazards. Many hauls included large quantities of rock and up to 2,000 pounds of sponge.

Fish catches on this cruise were generally small. Vermilion snapper, grunts, goatfish, and two species of sea bass provided the only signs of commercial significance. Of the 64 catches of sea bass, 48 were bank sea bass and 19 black sea bass. A depth preference of the two species was observed with bank sea bass caught in waters deeper than 10 fathoms, while black sea bass were found inside the 10-fathom curve. Both those species were taken together on three occasions, each time from 10 fathoms.

Surface school observations revealed a few jumping fish, probably little tuna (Euthynnus alletteratus). Surface schools tentatively identified as scad (Decapterus sp.) were observed 6 to 7 miles offshore from Cape St. George to Cape San Blas. (For area of operations during the cruise see map on page 40.)



Area of operations during M/V Hernan Cortez Cruise 1 (April 29-May 21, 1965).

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-29 (May 19-June 2, 1965): Small brown shrimp (68 count) were dominant in most trawl catches made in the up to 10-fathom depth during this cruise by the chartered research vessel Gus III. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., worked 8 statistical areas in another of a series of cruises in a continuing study of shrimp distribution in the Gulf of Mexico.

The vessel made 31 standard 3-hour tows with a 45-foot flat trawl, 48 plankton tows, 55 bathythermograph (BT), and 176 water (Nansen bottle) casts.

The more productive areas for small brown shrimp also yielded moderate catches of larger shrimp from various depths, and generally spotty catches of white shrimp ranging from 15-20 to 26-30 count.

The largest catch of the cruise was 75 pounds of brown shrimp (21-25 count) from a tow in the over 20-fathom depth range of area 21. The other depth ranges of that area accounted for mostly small brown shrimp of

Trawler Gus III (85 feet) chartered by the U.S. Bureau of Commercial Fisheries for shrimp research in the northern Gulf of Mexico.

68 count and a fair quantity of 31-40 count pink shrimp.

Area 14 yielded about 50 pounds of shrimp, with most of it running to large brown shrimp of 12-15 count from the greater depth ranges, but with both very small brown shrimp and large white shrimp (15-20 count) from the up to 10-fathom depth.

One 24-hour current measurement station was occupied by the vessel in 8 fathoms of water south of Morgan City, La. A total of 12 sediment samples was obtained there with a dredge from various locations within the study area.

Note: See Commercial Fisheries Review, July 1965 p. 25.

Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES: Production and Imports, January-April 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 4 months in 1965 amounted to 153,871 short tons--24,151 tons (or 13.6 percent) less than during the same period in 1964. Domestic production was 3,311 tons (or 21.2 percent) more but imports were 27,462 tons (or 16.9 percent) lower than in January-April 1964. Peru continued to lead other countries with shipments of 114,138 tons.

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

Item	Jan.-Apr. 1/1965	Jan.-Apr. 1964	Total 1964
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	7,468	3,047	160,349
Tuna and mackerel	7,222	4,999	21,113
Herring	1,275	415	8,881
Other	2,997	7,190	44,909
Total production	18,962	15,651	235,252
Imports:			
Canada	14,059	19,300	54,769
Peru	114,138	130,276	348,025
Chile	3,458	7,396	12,942
So. Africa Rep.	700	4,578	18,581
Other countries	2,554	821	4,826
Total imports	134,909	162,371	439,143
Available fish meal supply	153,871	178,022	674,395
Fish Solubles:			
Domestic production 2/	5,606	7,293	93,296
Imports:			
Canada	706	737	1,553
So. Africa Rep.	-	604	987
Other countries	2,133	198	1,965
Total imports	2,839	1,539	4,505
Available fish solubles supply	8,445	8,832	97,801

1/Preliminary.
2/50-percent solids.

The United States supply of fish solubles during January-April 1965 amounted to 8,445 tons--a decrease of 4.4 percent as compared with the same period in 1964. Domestic production dropped 23.1 percent, but imports of fish solubles increased 84.5 percent.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES: Production, April 1965: During April 1965, a total of 10,781 tons of fish meal and 10.2 million pounds of marine-animal oil was produced in the United States. Compared with April 1964 this was an increase of 2,671 tons

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

Product	April 1/1965	April 1964	March 1/1965	March 1964	Jan.-Apr. 1/1965	Jan.-Apr. 1964	Total 1964
	(Short Tons)						
Fish Meal and Scrap:							
Herring	236	-	497	-	1,275	415	8,881
Menhaden 2/	7,305	2,917	-	-	7,468	3,047	160,349
Tuna and mackerel	1,748	1,660	1,925	1,214	7,222	4,999	21,113
Unclassified	1,492	3,533	732	1,922	2,997	7,190	34,809
Total	10,781	8,110	3,154	3,136	18,962	15,651	225,152
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	3/	3/	10,100
Grand total meal and scrap	3/	3/	3/	3/	3/	3/	235,252
Fish Solubles:							
Menhaden	2,147	1,310	-	-	2,147	1,370	68,738
Other	1,030	2,582	957	994	3,459	5,923	24,558
Total	3,177	3,892	957	994	5,606	7,293	93,296
	(1,000 Pounds)						
Oil, body:							
Herring	105	-	184	-	576	132	10,354
Menhaden 2/	9,603	3,000	-	-	9,698	3,063	157,730
Tuna and mackerel	239	353	354	214	1,083	906	4,816
Other (including whale)	205	1,038	120	464	504	1,723	7,298
Total oil	10,152	4,391	658	673	11,861	5,824	180,198

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

of fish meal and about 5.8 million pounds of marine-animal oil. Fish solubles production amounted to 3,177 tons--a decrease of 715 tons as compared with April 1964.

* * * * *

Major Indicators for U. S. Supply, April 1965: United States production of fish meal and fish oil in April 1965 was higher by 32.9 and 131.2 percent, respectively, as compared with April 1964. Production of fish solubles was lower by 18.4 percent.

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

Item and Period	1/1965	1964	1963	1962	1961
	(Short Tons)				
Fish Meal:					
Production:					
April	10,781	8,110	8,340	9,359	6,112
Jan.-Apr. 2/	18,962	15,651	16,314	20,161	13,657
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
April	39,721	55,953	26,607	26,390	19,060
Jan.-Apr.	134,909	162,371	133,083	89,164	63,393
Year	-	493,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
April	3,177	3,892	5,037	4,305	2,965
Jan.-Apr. 2/	5,606	7,293	10,398	9,976	8,799
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
April	315	457	218	323	220
Jan.-Apr.	2,839	1,539	1,678	3,153	729
Year	-	4,505	7,112	6,308	6,739
	(1,000 Lbs.)				
Fish Oils:					
Production:					
April	10,152	4,391	6,551	5,645	3,344
Jan.-Apr. 2/	11,861	5,824	7,852	8,162	4,665
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
April	145	22,773	28,480	10,270	7,351
Jan.-Apr.	11,743	46,693	75,401	51,593	43,900
Year	-	151,469	262,342	123,050	122,486

1/Preliminary.
2/Data 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/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
4/No homogenized fish was produced in 1964.

* * * * *

Production by Areas, May 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for May 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

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

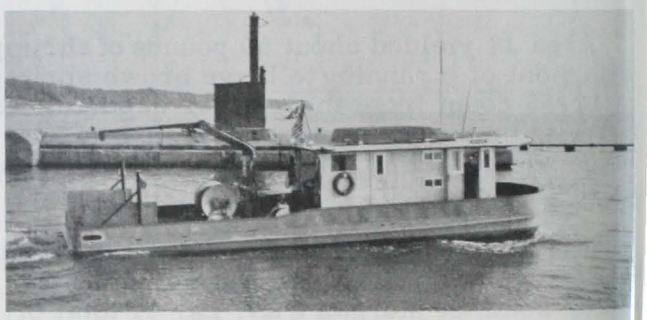
Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
May 1965:			
East & Gulf Coasts	22,631	22,253	9,765
West Coast 2/	1,720	290	1,139
Total	24,351	22,543	10,904
Jan.-May 1965 Total	43,421	34,491	17,717
Jan.-May 1964 Total	47,698	35,763	20,152

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes American Samoa and Puerto Rico.

Inland Fisheries Research

NEW TYPE RESERVOIR FISHERY RESEARCH VESSEL:

The new reservoir fishery research vessel, the Hiodon, of the U. S. Bureau of Commercial Fisheries, was launched at Saugatuck, Mich., in April 1965.



Reservoir fishery research vessel Hiodon of the U.S. Bureau of Commercial Fisheries.

The new steel vessel (45 feet long, 14 fe wide, and 16 gross tons) is designed for sha low-water operation. She has a flat bottom and tunnel stern which completely protects its twin propellers and rudders. Propulsio power is supplied by two 85-hp. diesel engines Equipped with the latest in hydraulic deck gear (including separated trawl winches, net reel, power block, and articulated crane, a of which are controlled from a central station), the vessel can engage in a variety of fishing methods.

The Bureau's new research vessel is als equipped with a roofed and partially enclose laboratory area and has two 600-gallon fish tanks with circulating water systems for hol ing live fish. She has a detachable heavy-duty axle and wheel assembly to facilitate launchings, hauling out, and transporting on

land without the need for special equipment and trailers usually required to handle vessels of that size and weight. The vessel has living accommodations for a crew of 4 for periods of up to 2 weeks.

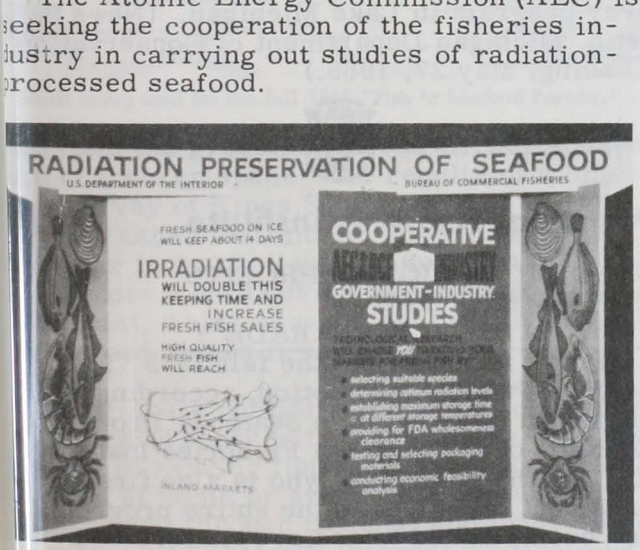
Shakedown trials of the new vessel were completed in Lake Michigan near Saugatuck the latter part of May after which she sailed for Mobridge, S. D., by way of Lake Michigan, Illinois-Mississippi-Missouri River Systems for most of the way. The vessel's new hauling rig was used to transport her overland the remaining 300 miles to Oahe Reservoir at Pierre, S. D.

Dedication ceremonies for the Hiodon were scheduled for early June in Mobridge.

Irradiation Preservation

FISHERIES INDUSTRY INVITED TO JOIN STUDY OF SEAFOOD:

The Atomic Energy Commission (AEC) is seeking the cooperation of the fisheries industry in carrying out studies of radiation-processed seafood.



The Commission's Marine Products Development Irradiator, located at the Gloucester (Mass.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries, will be used in the studies. The irradiator is the only one in the world expressly designed for pasteurization of fishery products. The plant was licensed by the AEC on March 17, and was fully operational on April 19, 1965. The pilot plant's radiation chamber contains a 50,000-curie cobalt-60 source which is capable of processing fishery products at the rate of 1 ton an hour.

Fishery products treated in the irradiator are still fresh, raw, and cold when they emerge from the radiation chamber. Pasteurization--reduction of bacteria--is accomplished by radiant energy. Extensive research has shown that this new, heatless pasteurization process will double or triple the shelf life of fresh fishery products. After irradiation, the fish are kept at refrigerator temperatures.

The marine products irradiator at Gloucester will be available to the fisheries industry for experimental processing of limited quantities of seafood for shipping, storage, and acceptability tests and for evaluation of the product in commercial plant and laboratory facilities. Irradiated products will not be made available for commercial use or sale to the public at this time. The information obtained will be helpful in further developing the process for future commercial application.

Commercial seafood processors and distributors interested in negotiating a cooperative agreement with the AEC at no cost should contact the Director, Division of Isotopes Development, U. S. Atomic Energy Commission, Washington, D. C. 20545.

Maine Sardines

CANNED STOCKS, JUNE 1, 1965:

Canners' stocks of Maine sardines on June 1, 1965, were down sharply from those of the same date in 1964 and 1963.

Final data show 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.

The new Maine sardine canning season opened on the traditional date of April 15, 1965, and the pack to July 3, 1965, totaled 265,000 standard cases, as compared with the pack to July 3, 1964, of 100,000 cases. Generally, the pack during June 1965 consisted of smaller fish which yield a high-quality pack.

The new law legalizing year-round canning of Maine sardines will remove the tra-

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

Type	Unit	1964/65 Season				1963/64 Season					1962/63 Season		
		6/1/65	4/1/65	1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63
Distributors	1,000 actual cases	198	236	238	291	234	254	291	261	308	217	215	264
Canners	1,000 std. cases 2/	203	314	538	629	514	499	658	1,063	1,255	643	536	699

1/Table represents marketing season from November 1-October 31.

2/100 $3\frac{3}{4}$-oz. cans equal one standard case.

Source: U.S. Bureau of the Census, Canned Food Report, June 1, 1965.

ditional 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.

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

Michigan

FEDERAL FUNDS REQUESTED FOR LAKE TROUT STUDY:

Michigan's Department of Conservation filed a request in May 1965 for $40,400 in Federal funds for an extensive study on the progress of lake trout restoration work in State of Michigan waters of Lake Michigan during the 1965/66 fiscal year. Funds for the lake trout assessment study, which is planned as a continuing annual project, are being sought through the U. S. Fish and Wildlife Service under provisions of the new Commercial Fisheries Research and Development Act. Plans for undertaking this full-scale study were timed with the June 1965 initial stocking of 1.2 million marked yearling lake trout in northern waters of Lake Michigan.

As spelled out in its application for Federal funds, Michigan's Department of Conservation plans to concentrate opening investigations in that part of Lake Michigan where sea lamprey control efforts were started several years ago and where re-establishment of lake trout populations is most likely to occur first. Under the proposed project, lake studies would cover such major checkpoints as the progress of sea lamprey control, the survival of planted trout as they are affected by predation and harvests of commercial and sport fishermen, and the dispersal of those fish in Lake Michigan after they are released. Field checks will also be made to measure the growth and spawning success of planted lake trout, and their use of natural food supplies in the lake. Additional investigations will be conducted on the relationship between lake trout and other species, and on commercial fishery statistics.

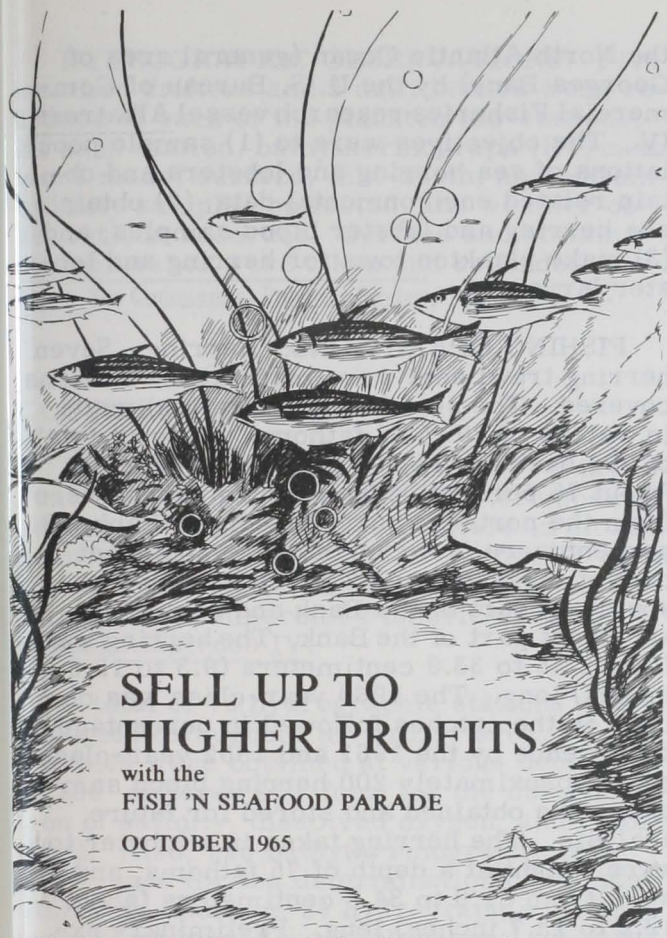
It is expected that commercial fishing for lake trout will be closed in Lake Michigan, as it has been in Lake Superior, until the rehabilitation of that species appears to be a sure thing. If so, a small number of commercial operators will be contracted to make modest catches of lake trout to collect scale and stomach samples and other needed biological information. From commercial catches, Michigan's Conservation Department would also examine lake trout for lamprey scars. This would supplement fact-finding efforts by the U. S. Bureau of Commercial Fisheries which are already under way to evaluate the status of the sea lamprey program in Lake Michigan. (News Bulletin, Michigan Department of Conservation, Lansing, May 27, 1965.)

National Fisheries Institute

SELL UP TO HIGHER PROFITS IS THEME OF 1965 "FISH 'N SEAFOOD PARADE":

Profit is the key to the fall 1965 "Fish 'n Seafood Parade" promotion, according to the chairman of the Fish 'n Seafoods Promotions Division of the National Fisheries Institute (NFI). The chairman, who is also first vice-president of NFI, said the entire program has been planned to assist retailers and mass-feeding operators to "sell up to higher profits."

The "Fish 'n Seafood Parade" promotional campaign for 1965 is three-pronged--advertising, publicity, and point-of-purchase materials--and is backed up by more industry advertising than ever before. The biggest promotion of its kind, sponsored by industry and government, will begin this summer with full-page advertisements in retail trade magazines showing that fish and sea-



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

ood yield the greatest gross profit per square nch of freezer space--the results of a nine- ear survey of Kings Super Markets of New ersey. Other testimonial advertisements, c appear in institutional trade magazines, ill feature a well-known White Plains, N.Y., estaurant, which shows a healthy profit of e seafood dishes it serves.

A full-scale publicity campaign to acquaint l buyers of foods with the "Parade" and the enefits of serving fish and seafoods--wheth- r eaten at home or away from home--will e channeled through national and mass-feed- ng magazines, special-interest publications, nd newspapers. Fish and shellfish cookery-- ase of preparation, versatility, and nutri- ion--will be brought to the attention of home- nakers throughout the United States through he medium of television and radio. Store isplays, posters, counter cards, bar strips, nd menu clip-ons all will feature beautiful nderwater photography.

Area "Fish 'n Seafood Parade" commit- ees are now being formed. Those commit- ees are made up of industry people who will plan local publicity and advertising promotions to tie in with the national campaign.

All promotions--both national and regional--will have the full cooperation of the U. S. Bureau of Commercial Fisheries, as in the past. The Bureau's field representatives will work closely with committees of businessmen in carrying out their regional promotion programs. Fishery bulletins and cookery leaflets distributed by the U.S. Bureau of Commercial Fisheries will feature the economy and easy availability of fishery products.

Note: Merchandising materials for the promotional campaign may be obtained through seafood packers and processors, or by buying them direct from the Fish 'n Seafoods Promotions Division, National Fisheries Institute, 1614 20th Street NW., Washington, D. C. 20009.

North Atlantic

SOVIET FISHING ACTIVITY OFF COAST, JUNE 1965:

Soviet fishing activity in the Northwest Atlantic increased substantially during June 1965. A total of 178 vessels were sighted and identified as 48 factoryship stern trawlers, 116 refrigerated and nonrefrigerated side trawlers, 10 processing and refrigerated fish transports, 3 base ships, and one fuel and water carrier. This compared with an estimated 125 vessels sighted in May and 120 vessels in June 1964.

Fig. 1 - Large Soviet factory stern trawler of the "Tropik" class in the North Atlantic.

The larger number of vessels in June was attributed to the deployment of some 60 vessels of the SRT and SRTR classes from the Sable Island area to Georges Bank. It was believed the lack of fish in the former area prompted the move.

Soviet fishing operations during the month generally ranged from south of Martha's Vineyard eastward along the 100-fathom curve of the Continental Shelf to the south-

west and southeast parts of Georges Bank--120 to 175 miles southeast and east of Cape Cod.

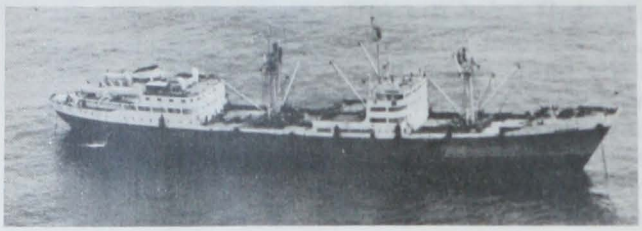


Fig. 2 - Soviet refrigerated fish transport operating in Northwest Atlantic.

Although most of the vessels appeared actively engaged in fishing operations, only moderate catches of predominantly whiting and lesser quantities of herring were observed being taken. Toward the end of the month a fleet of Soviet vessels was sighted 40 miles south of Martha's Vineyard. That area is generally regarded productive for whiting about that time of year. United States fishermen reported good catches about 25 miles north of that area.

Fig. 3 - Soviet fishery base ship in Northwest Atlantic.

There were no reports during the month of Soviet fishing activity along the middle Atlantic Coast areas. Information received indicated that about 20 Soviet vessels fished those areas in May. In May 1964 a total of 14 Soviet SRT's and SRTR's were sighted off the North Carolina coast.

Note: See Commercial Fisheries Review, July 1965 p. 30.

North Atlantic Fisheries Investigations

HERRING AND LOBSTER OFFSHORE POPULATION STUDIES CONTINUED:

M/V "Albatross IV" Cruise 65-8 (June 8-18, 1965): Biological investigations related to offshore populations of herring and lobsters were conducted during this cruise in the North Atlantic Ocean (general area of Georges Bank) by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The objectives were to (1) sample populations of sea herring and lobsters and obtain related environmental data; (2) obtain sea herring and lobster blood samples; and (3) make plankton tows for herring and lobster larvae.

FISHING OPERATIONS: Herring: Seven herring trawl sets were made at the stations covered. The sets (1 hour duration) made in waters of 30 to 45 fathoms yielded a total of 204 bushels (15,000 pounds) of herring. About 75 percent of the herring caught were from the northern part of Georges Bank, 23 percent were from south of the southeast part of the Bank, and 2 percent from the southeast part of the Bank and east of the southeast part of the Bank. The herring were from 23.5 to 33.9 centimeters (9.3 to 13.3 inches) long. The 1960 year-class was dominant in the catches followed in percentage occurrence by the 1961 and 1962 year-classes. Approximately 200 herring blood samples were obtained and stored for future analysis. The herring taken in a lobster tow were caught at a depth of 75 fathoms, and were from 31.0 to 34.8 centimeters (about 12.2 to 13.7 inches) long. Preliminary examination showed that the majority of fish in the sample were from the 1958 and 1957 year-classes.

Lobster: A total of 30 trawl sets were made at the 7 lobster stations worked. The sets made in depths ranging from 65 to 250 fathoms yielded 397 lobsters--239 females, and 158 males. Of the females, 143 were berried (egg-bearing), and half of them had ripe eggs. Three of the females were spent. The mean weight of the catch was around 5 pounds and ranged in weight from $\frac{1}{4}$ to 16 pounds. Some 200 lobster blood samples were taken for future analysis. At Veatch's Canyon on Georges Bank, lobsters were concentrated west of the Canyon at 150 to 250 fathoms. At Corsair Canyon, lobsters were concentrated southwest of the Canyon at 65 to 100 fathoms.

PLANKTON OPERATIONS: Herring: A total of 28 one-meter net plankton tows of 15 minutes duration (5 minutes each at depths of 32.8 feet, 16.4 feet, and at the surface) were made during the cruise. Lobster: Eight 1-meter net plankton tows lasting 15 minutes each (at the surface) were made.

HYDROGRAPHIC OBSERVATIONS: Five sea-bed drifters and 5 drift bottles were released at each of the plankton tow stations. At each station, bathythermograph (BT) casts were made; surface, mid-depth, and bottom salinity samples collected; and weather observations recorded. Surface and bottom temperatures were taken and recorded.

Note: See Commercial Fisheries Review, July 1965 p. 35.

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CONTINENTAL SHELF WATERS SURVEYED:

M/V "Albatross IV" Cruise 65-7 (May 19-June 3, 1965): To conduct an environmental survey of Continental Shelf waters in an area bounded by longitudes 64°30' W. and 72°30' W. was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 76 hydrographic stations was occupied throughout the cruise area. Water samples were obtained at various depths up to 250 meters (820 feet) for the determination of salinity, dissolved oxygen, and chlorophyll. Also, 228 bathythermograph casts were made for the determination of temperature. In addition, 24 hydrographic stations were occupied at 2-hour intervals at a moored buoy and at a floating buoy moored with a parachute drogue to determine the temporal fluctuations of these properties, and of zooplankton biomass due to tidal oscillations and internal waves.

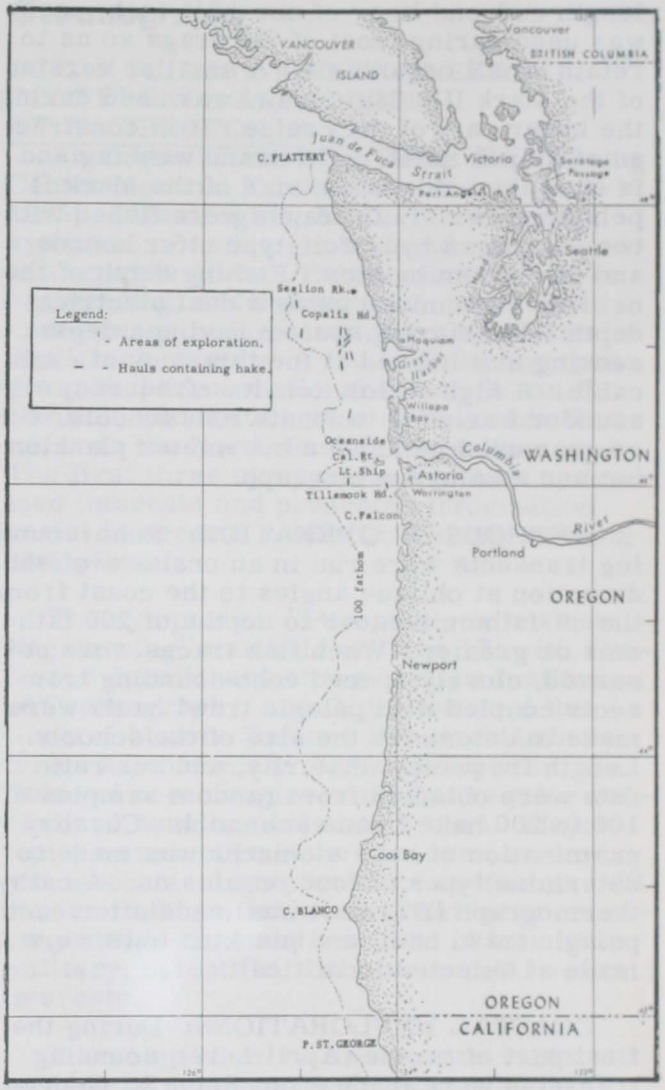
The Albatross IV was scheduled for another cruise on June 8 to the vicinity of Georges Bank in the North Atlantic to study the distribution of sea herring and lobsters in relation to their environment.

Note: See Commercial Fisheries Review, July 1965 p. 35; February 1965 p. 35.

North Pacific Fisheries Explorations and Gear Development

HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 71 (April 1-May 27, 1965): Explorations for Pacific hake (Merluccius productus) along the Pacific coast from Cape Flattery, Wash., to Pt. St. George, Calif., and in selected areas of Puget Sound were conducted during this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.



Shows areas of exploration during M/V John N. Cobb Cruise 71 (April 1-May 27, 1965).

Principal objective of the cruise was to determine when and where Pacific hake schools appear off the coasts of Washington and Oregon in the spring. Secondary objectives were to obtain: (1) further information on the seasonal availability of Pacific hake in Puget Sound waters; (2) additional data relative to the catching efficiency of the "Cobb" pelagic trawl, and (3) biological data on Pacific hake, such as degree of maturity, size and sex composition of catches, and the presence or absence of hake larvae and eggs.

GEAR USED: The principal gear used during the explorations was a Mark II "Cobb" pelagic trawl constructed of 3-inch mesh monofilament webbing. A three-quarter

length cod-end liner of one-half-inch mesh was used during most of the drags so as to retain small organisms. A smaller version of the Mark II pelagic trawl was used during the latter part of the cruise. It is constructed of 2-inch mesh multistrand webbing and is about two-thirds the size of the Mark II pelagic trawl. Both trawls were fished with two aluminum hydrofoil-type otter boards and 60-fathom bridles. Fishing depth of the net was determined using a dual electrical depth telemetering system having a depth-sensing unit housed at the terminus of each cable. A high-resolution, low-frequency echo-sounder was used to locate fish schools. Other gear used included a one-meter plankton net and a bathythermograph.

METHODS OF OPERATION: Echo-sounding transects were run in an onshore-offshore direction at oblique angles to the coast from the 30-fathom contour to depths of 200 fathoms or greater. When fish traces were observed, closely spaced echo-sounding transects coupled with pelagic trawl hauls were made to determine the size of the schools. Length frequency, maturity, and sex ratio data were obtained from random samples of 100 to 200 hake from each catch. Cursory examination of hake stomachs was made to determine types of food organisms. A bathythermograph (BT) cast was made after each pelagic trawl haul, and plankton tows were made at selected localities.

COASTAL EXPLORATIONS: During the first part of cruise (April 1-19), sounding transects were made from Point St. George to Cape Flattery. Heavy echo traces suggestive of Pacific hake were observed off St. George reef, Calif., on April 4 and off Oceanside, Wash., on April 15. The fish traces off St. George reef were at a depth of 24 fathoms over a bottom depth of 44 fathoms. Sea lions were observed in the vicinity feeding on what appeared to be hake. The pelagic trawl could not be fished because of large northwest swells. Fish traces observed off Oceanside were over bottom depths of 35 to 45 fathoms. A half-hour pelagic trawl haul was made on those traces, but no hake were caught. The catch consisted mainly of about 350 pounds of anchovies (Engraulis mordax) and 80 pounds of yellowtail rockfish (Sebastodes flavidus). Only two other hauls were made during the period, both of them off Cascade Head, Oreg. Neither haul yielded any hake.

During the latter part of the cruise (May 6-25), sounding transects were made from Cape Flattery to Cape Falcon, Oreg. Hake schools were first encountered off Grays Harbor and Copalis Head on May 7. The schools were not heavily concentrated, bein scattered in isolated aggregations from about the 40-fathom contour to the edge of th Continental Shelf, with most frequent occurrences between the 45-60-fathom contours. Five hauls made in the vicinity of Copalis Head and Grays Harbor yielded from 152 pounds to 29,290 pounds of hake per hour of trawling. The 152-pound catch also contain 4,000 pounds of anchovies, 1,000 pounds of herring, and 2,000 pounds of yellowtail rock fish. Sounding transects southward of Gray Harbor located hake schools north of the Astoria Canyon, over the eastern edge of the Canyon, southwest of the Columbia River lightship and off Tillamook Head. The schoo north of Astoria Canyon was concentrated in a narrow band over bottom depths between 66-70 fathoms, and extended in a north-sout direction for about 5 miles. A half-hour hau made on that school yielded a 6,150-pound catch, of which 6,000 pounds were hake.

Fig. 2 - A good catch of hake using the "Cobb" pelagic trawl.

The schools over the Astoria Canyon and southwest of the Columbia River lightship were small and produced light to moderate echo traces. The school off Tillamook Hea extended over a bottom depth interval of 45 to 68 fathoms and was about 20 fathoms off the bottom. Its north-south extent was not defined. A half-hour haul with the smaller pelagic trawl made on that school yielded 5,000 pounds, consisting almost entirely of hake.

Sounding transects were continued in the vicinity of Willapa Bay and Grays Harbor during May 17-25. Eight hauls made during that period yielded from 400 to 48,000 pounds of hake per hour of pelagic trawling. The 400-pound catch was made off Sealion Rock, the most northern limit where hake were found. The 48,000-pound haul was made off Grays Harbor over bottom depths of 52-55 fathoms on the heaviest echo traces observed during the cruise.

No hake were encountered off Washington and Oregon from April 1 to 19. During the latter part of cruise (May 7-25), hake were taken as far north as Sealion Rock.

EXPLORATIONS IN PUGET SOUND: Pacific hake were found in northern Puget Sound, Hood Canal, and Saratoga Passage. Two of 5 hauls of one-half hour duration made in northern Puget Sound accounted for catches of 2,500 and 5,500 pounds of hake. The remaining 3 hauls in northern Puget Sound were made to test the fishing and telemetry gear. Two drags were made in Saratoga Passage; 1 drag was for test purposes and the other yielded 150 pounds of hake. Two half-hour hauls in Hoods Canal yielded 2,500 and 3,500 pounds of hake.

FISH SIZE, MATURITY, AND STOMACH CONTENTS: Samples of hake taken in Puget Sound were smaller than those caught off Washington and Oregon. Puget Sound hake ranged in size from 7 to 68 centimeters (2.8 to 26.8 inches) and their size composition showed three distinct modes--4.7, 9.8, and 14.2 inches. Hake taken off Washington ranged in size from 40 to 68 centimeters (15.7 to 26.8 inches) with a mode at 53 centimeters (20.9 inches). Those off Oregon and the Columbia River entrance ranged in size from 30 to 77 centimeters (15.7 to 30.3 inches) with a mode at 50 centimeters (19.7 inches).

OTHER ACTIVITIES AND OBSERVATIONS: In cooperation with the Bureau's Seattle Technological Laboratory, hake were delivered to several reduction plants for meal- and oil-yield tests and to a processing plant for fillet studies.

Pacific lamprey (Entosphenus tridentatus) were taken in several catches off Oregon and Washington. Several hake were found with serious lamprey-inflicted wounds, which had penetrated the peritoneum.

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

Oceanography

OCEAN SCIENCE AND ENGINEERING CONFERENCE AND EXHIBIT AT WASHINGTON, D. C.:

An Ocean Science and Ocean Engineering Conference and Exhibit was held June 14-17, 1965, at Washington, D. C. Six different symposia of both a general and specialized nature were given. Perspectives in ocean engineering, underwater vehicles, atomic energy uses in the ocean, marine mineral resources, results of the U. S. biology program in the International Indian Ocean Expedition, and distribution of Columbia River water in the North Pacific were discussed. The first three symposia cut across specialized interests and presented information useful to several scientific and engineering disciplines.

The symposium "Perspectives in Ocean Engineering" was held on June 17, with Professor John Isaacs of the Scripps Institution of Oceanography and D. S. Potter of the General Motors Defense Research Laboratories as chairmen. It discussed several fields of ocean engineering that require generalized development at this time. Major topics were motion in the sea, remote sensing, and mechanical properties of sediments. Advances in those fields are considered necessary at this time and would be of benefit to military, scientific, and commercial ocean interests.

The symposium on underwater vehicles on June 16 encompassed three topics: (1) present design and operational parameters involved in existing underwater vehicles; (2) future vehicles, both manned and unmanned, and their design concepts; and (3) materials now used in the construction of underwater vehicles and those likely to be used in the future.

A special symposium called "Nuclear Power for use in the Ocean" was sponsored jointly by the Atomic Industrial Forum and the Marine Technology Society. Held on June 17, it was devoted to existing and potential uses of nuclear power from the points of view of requirements and capabilities. Power sources for deep submergence and industrial applications of nuclear power for the extraction of oil and minerals were discussed.

The Conference and Exhibit was co-sponsored by the Marine Technology Society and

the American Society of Limnology and Oceanography, and also included sessions of contributed papers and special panels and addresses.

Note: See Commercial Fisheries Review, May 1965 p. 30; Mar. 1965 p. 45.

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PLANS FOR NUCLEAR-POWERED RESEARCH SUBMARINE STUDIED BY INTERIOR DEPARTMENT:

A study sponsored by the U. S. Bureau of Commercial Fisheries shows that it is feasible to build a specially designed nuclear-powered submarine for fishery and oceanographic research, said Secretary of the Interior Stewart L. Udall, June 17, 1965. The study was conducted by a firm noted as the pioneer submarine designer and builder that developed the nuclear submarines Nautilus, Skipjack, George Washington, and others.

United States scientists have long desired an oceanographic underseas craft of a speed, range, and maneuverability that only a nuclear craft possesses, the Interior Secretary noted. Such a submarine could study fish behavior, distribution of resources, disposal of atomic wastes, water temperatures, salinity, and many other oceanographic problems that are now approached mostly by means of instruments lowered from the deck of a ship. The Soviet Union has used a converted military submarine in fishery studies for several years, but the conventional underseas craft lacks speed, maneuverability, and many scientific advances that an atomic submarine could have.

According to the preliminary study by the submarine designing contractor, the new research vessel would be 163 feet long, 23 feet in diameter, and carry a crew of 24, plus 7 scientists. It would be able to operate at depths as great as 1,000 feet and while submerged be capable of 20 knots, a speed at which some of the swifter tuna swim. Fishery scientists believe most of the great fishery resources are located in the layer between the surface and a depth of approximately 1,000 feet. Throughout that range they would be able to observe fish and other marine organisms in their natural environment and collect samples at known depths. Such knowledge would permit man to undertake more sophisticated approaches to harvesting the resources of the sea.

Among scientific advances contained by the atomic vessel would be an observation sphere in the bow, remote controlled television cameras for areas not visible from the bow, and a complex system of sampling instruments providing oceanographic data to a computer aboard the vessel. One of the principal advantages of an atomic craft, in addition to its advanced scientific equipment, said Donald L. McKernan, Director of the Bureau of Commercial Fisheries, would be its capability of making continuous scientific observations under sea conditions too rough for most surface oceanographic vessels, especially during the winter.

The research submarine would cost an estimated $25 million. The Bureau Director said that while the cost may seem high, "bold new approaches to scientific problems, such as this type of vessel represents, are necessary if the United States' share of the world's fisheries is to be increased." He added that the National Academy of Sciences' Committee on Oceanography estimated that the present contribution of United States fisheries to the Gross National Product is $1 billion annually. He said the Committee also predicted that the $1 billion figure could be tripled in 10 years if ocean research were conducted on a sufficiently broad scale. And he pointed out that this does not include other scientific contributions which would result from the broad scale oceanographic research to be undertaken by an atomic submarine. Director McKernan said he has asked the National Academy of Sciences to set up a special committee to assess various aspects of the study and to advise the Bureau how best to proceed.

Note: See Commercial Fisheries Review, May 1963 p. 35.

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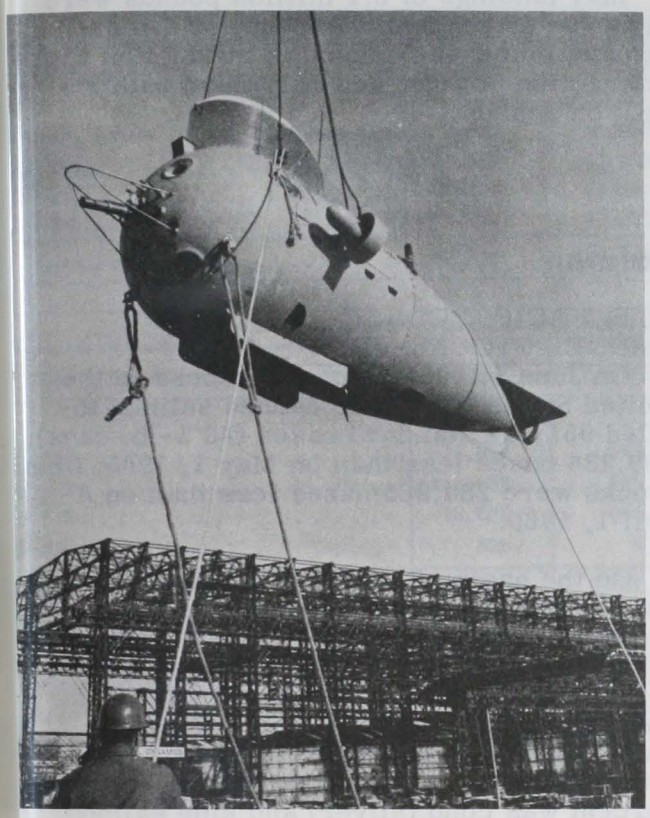
SUBMARINE USED TO EXPLORE SEA FLOOR OFF RHODE ISLAND:

University of Rhode Island scientists were scheduled to explore the sea floor of Narragansett Bay and Block Island Sound for a 12-day period starting June 2, 1965, using a 2 man submarine named for the Phoenician goddess Asherah.

Capable of descending to a maximum depth of 600 feet and moving at speeds up to 4 knots, the electric-powered submarine was constructed by a private firm for the University of Pennsylvania Museum which, in cooperation with the National Geographic Society, used the vehicle for underwater



2-man electric submarine explores the sea floor off Rhode Island.

rcheological exploration in the Aegean Sea
f the Turkish coast in the summer of 1964.

The associate professor of geological
eanography who conceived the Rhode Island
oject said he wanted to explore the under-
ter hills, valleys, and other "topographic"
atures off the Rhode Island coast. He was
rticularly interested in the area from Castle
ll north in the East Passage. "There's a
p valley here nearly 200 feet deep. It is
usual in that it's fairly deep, yet close to
nd," he explained. He also hoped to learn
mething about the actions of physical and
ological agents on the bottom itself. In ad-
on to direct observations, he planned to
ke a photographic and audio-tape record
bottom features.

His activities, including the costs of serv-
es for the submarine, its support equip-
nt, and its personnel, are covered by con-
cts with the Office of Naval Research.

If submersibles prove to be a useful tool
his work, he said he may take advantage
an opportunity in 1966 to use a submarine
pable of going to depths of several thousand
t.

Another Rhode Island oceanographer was scheduled to spend 2 days in Block Island and Long Island Sounds attempting to survey the density and locations of plants in depths up to 140 feet. His work is supported by the National Institutes of Health. If scientists can learn more about underwater plant growth, sewage and other organic materials draining into coastal areas might be handled to re-enrich the water instead of polluting it. The wastes would then serve as a sort of marine fertilizer promoting the growth of desirable marine plants and indirectly providing food for various marine organisms.

Throughout the operations the 41-foot work-boat Billie II was to act as a tender and tug, carrying necessary support equipment. An observer-maintenance man, was to remain on the surface in continuous communication with the submarine.

The submarine has six viewports, which allow observation forward, downward, and to the sides. In addition, a plexiglass free-flooding "bubble" above the main hatch provides 270-degree visibility when the vessel is on the surface and protects the hatch area so that personnel may be transferred while afloat.

Driven by two side-mounted rotatable electric propulsion pods (two horsepower each), the vehicle can move in all directions. Commenting on its ability to hover, the University of Pennsylvania Museum said in a publication that the vehicle "Maneuvered like a helicopter." It is 17 feet long, weighs 8,500 pounds, and is capable of operating underwater for 10 hours under normal conditions. However, it is equipped with an air rebreathing and oxygen system sufficient to maintain the operator and observer for 24 hours, if necessary. (University of Rhode Island, May 28, 1965.)

Retail Prices

FISHERY PRODUCTS
RETAIL PRICE INDEXES, 1963-65:

The U. S. retail price index for fishery products in 1964 was at 107.4 percent of the 1957-59 average, as computed by the Bureau of Labor Statistics, U. S. Department of Labor. Compared with the 1963 index of 110.0 percent, retail prices for fishery products in 1964 were down 3.2 percent.

Based on an average price index of 109.8 in the first quarter of 1965, retail prices for fishery products were down 1.7 percent from the same quarter in 1964. (National Food Situation, NFS-112, May 1965, U. S. Department of Agriculture.)

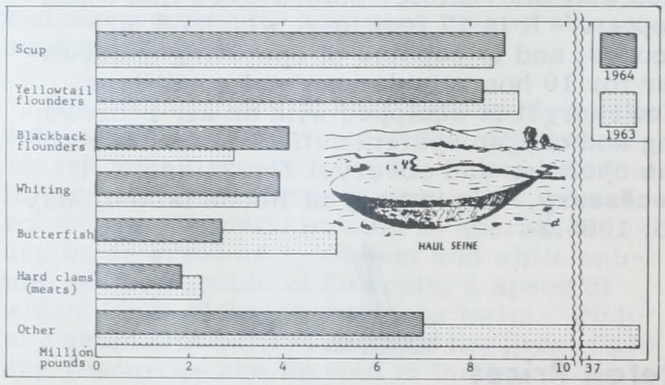
Note: Indexes revised by Bureau of Labor Statistics beginning January 1964. Item selection and quantity weights for foods covered (including fishery products) in Retail Food Price Indexes and Consumer Price Index reflect the buying pattern of wage earners and clerical workers in 1960-61 and for the first time include single person families. Series are linked at December 1963.

Rhode Island

FISHERY LANDINGS, 1964:

Landings of fish and shellfish at Rhode Island ports during 1964 were 36.4 million pounds valued at $3.6 million. Compared with 1963, this was a drop of 32.9 million pounds and $507,000. The catch used for food was down 2.7 million; and that for industrial purposes, principally fish meal, dropped 30.2 million pounds.

During 1964, scup led all edible items with 8.7 million pounds. Yellowtail and blackback flounders were next with 8.2 and 4.1 million pounds, respectively. Whiting was third with 3.9 million pounds, followed by butterfish with 2.7 million pounds, and hard clams with 1.8 million pounds of meats. Eighty-one percent of the year's total was made up of these 6 varieties of fish and shellfish.



Rhode Island landings, 1964 and 1963.

The majority of the 1964 catch was taken by otter trawlers--25.2 million pounds or 69 percent of the year's total. Floating traps took 8.8 million pounds or 24 percent, tongs and rakes took 1.5 million pounds or 4 percent, and various other types of gear caught 900,000 pounds or 3 percent.

May landings of 8.1 million pounds were highest--68 percent was scup, or 5.5 million pounds. June was second in production with 4.6 million pounds, and July third with 3.5 million pounds.

Salmon

U. S. PACIFIC COAST CANNED STOCKS, JUNE 1, 1965:

On June 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 951,644 standard cases (48 1-lb. cans), 199,236 cases less than on May 1, 1965, when stocks were 284,865 cases less than on April 1, 1965.

On the basis of a total of 1,131,940 actual cases (consisting of cans of $\frac{1}{4}$-lb., $\frac{1}{2}$-lb., 1-lb. etc.), pink salmon accounted for 45.6 percent (515,796 cases of which 416,225 cases were 1-lb. talls) of the total canners' stocks on June 1, 1965. Next came chum (331,956 cases, mostly 1-lb. talls), followed by red (180,128 cases). The remainder of about 9.2 percent was coho (silver) and king salmon. Pink salmon stocks on hand packed in 48 1-lb. cans accounted for 80.7 percent of the total pink salmon stocks as of June 1, 1965, with the balance mostly in 48 $\frac{1}{2}$-lb. cans.

Table 1 - Total Canners' Stocks of Pacific Canned Salmon, June 1, 1965

Species	June 1, 1965	May 1, 1965	Apr. 1, 1965
	(No. of Actual Cases)		
King	30,336	39,645	46,882
Red	180,128	227,847	299,277
Coho	73,724	87,255	102,233
Pink	515,796	654,421	849,663
Chum	331,956	373,892	428,803
Total	1,131,940	1,383,060	1,726,858

From May 1 to June 1, 1965, pink salmon stocks were lower by 138,625 actual cases (1-lb. talls lower by 103,218 cases), reds were down 47,719 cases, and chums were down 41,936 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,992,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Table 2 - Total Canners' Stocks on Hand June 1, 1965 (Sold and Unsold), by Species and Can Size

ase & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
-lb.	2,599	42,630	14,309	1,870	21	61,429
-lb.	24,154	101,383	13,403	92,327	37,182	268,449
-lb.	3,496	36,092	43,935	416,225	284,073	783,821
-lb.	87	23	2,077	5,374	10,680	18,241
otal	30,336	180,128	73,724	515,796	331,956	1,131,940

Table 3 - Canners' Shipments from July 1, 1964 to June 1, 1965, by Species and Can Size

ase & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
-lb.	21,648	385,302	108,383	9,811	1,423	526,567
-lb.	112,688	585,711	40,972	511,141	120,909	1,371,421
-lb.	18,625	461,962	124,574	1,981,699	594,534	3,181,394
-lb.	329	4,927	19,413	94,023	28,862	147,554
otal	153,290	1,437,902	293,342	2,596,674	745,728	5,226,936

Shipments during May 1965 totaled 199,236 andard cases. Shipments at the canners' wel of all salmon species from July 1, 1964, June 1, 1965, totaled 4,146,300 standard ses.

The new 1965 season Alaska salmon pack aled 103,755 standard cases as of June 20, 65. This compared with 65,650 cases on ne 21, 1964. Most of the new pack consist- of red and king salmon packed at canner- in central and western Alaska.

Data on canned salmon stocks are based reports from U. S. Pacific Coast canners o packed over 96 percent of the 1964 salm- pack. (Division of Statistics and Econom- , National Canners Association, June 29, 65.)

Based on data submitted to the U. S. Bu- au of the Census by a sample of whole- ers and warehouses of retail multiunit ganizations, distributors stocks of salmon, asured in the survey for the first time, re estimated at 671,000 actual cases on ne 1, 1965.

rimp

S. PRODUCTION OF MANUFACTURED RIMP PRODUCTS, 1964:

The United States production of frozen eaded (raw and cooked) shrimp in 1964

Fig. 1 - Packing heads-off fresh shrimp in consumer packages for freezing in a Florida plant.

Fig. 2 - Breading peeled and deveined shrimp at a Tampa, Fla., shrimp-processing plant. This method of processing shrimp for the convenience of the consumer has increased in importance in recent years.

Fig. 3 - Conveyor belt transports shrimp to weighing and packing line.

U. S. Production of Manufactured Shrimp Products, 1954-1964

Year	Fresh and Frozen					
	Raw, Headless		Peeled, Raw (Including Deveined)		Cooked (Including Peeled & Deveined)	
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
1964. . .	1/	1/	1/	1/	1/	1/
1963. . .	66,441	47,687	22,155	25,711	2,322	3,750
1962. . .	51,177	47,214	18,129	22,032	3,139	5,401
1961. . .	46,417	35,262	17,236	18,303	2,593	4,021
1960. . .	78,071	47,636	19,287	18,500	2,871	4,281
1959. . .	61,598	36,980	11,096	9,945	1,891	2,816
1958. . .	63,276	48,214	7,622	8,450	2,080	3,405
1957. . .	58,269	45,070	9,375	9,952	1,444	2,488
1956. . .	64,355	42,633	7,512	7,304	2,237	3,101
1955. . .	69,122	39,690	6,745	5,895	1,758	1,798
1954. . .	82,416	43,115	4,156	2,605	1,607	2,056

Year	Breaded (Raw and Cooked)		Specialties (Soups, Stews, Sticks, etc.)		Total Fresh and Frozen	
1964 2/.	90,678	63,041	1/	1/	1/	1/
1963. . .	76,216	53,527	5,101	4,151	172,235	134,826
1962. . .	76,803	62,230	5,514	4,583	154,761	141,460
1961. . .	73,795	55,089	5,743	4,413	145,783	117,088
1960. . .	70,348	47,015	5,829	4,102	176,405	121,534
1959. . .	69,764	45,314	3,635	2,693	147,985	97,748
1958. . .	60,865	43,622	3,664	2,938	137,507	106,628
1957. . .	51,085	37,764	3,555	2,858	123,727	98,133
1956. . .	50,888	37,301	2,907	1,688	124,899	92,027
1955. . .	38,991	26,907	1,657	1,252	118,274	75,543
1954. . .	24,802	17,579	524	460	113,504	65,814

Year	Canned				Sun-dried	
	Natural (Drained Weight)		Specialties (Soups, Stews, etc.)			
1964 2/.	9,740	12,917	587	246	1/	1/
1963. . .	15,904	19,531	423	201	454	380
1962. . .	13,249	18,973	264	172	372	598
1961. . .	9,284	11,742	289	120	418	745
1960. . .	14,268	17,233	201	61	710	796
1959. . .	13,832	16,948	178	51	322	291
1958. . .	14,308	20,791	246	94	349	494
1957. . .	9,120	13,136	394	159	347	561
1956. . .	13,636	16,421	571	336	471	607
1955. . .	13,516	13,562	287	116	498	416
1954. . .	14,021	13,691	305	101	985	597

Year	Cured (Salted, Pickled and Smoked)		Meal and Bran		Grand Total
1964 2/.	1/	1/	754	15	1/
1963. . .	1/	1/	494	16	154,954
1962. . .	1/	1/	596	17	161,219
1961. . .	-	-	592	11	129,706
1960. . .	1/	1/	358	10	139,634
1959. . .	12	24	1,254	39	115,101
1958. . .	57	92	1,162	30	128,129
1957. . .	76	102	808	23	112,115
1956. . .	37	56	1,122	34	109,482
1955. . .	69	74	1,036	34	89,746
1954. . .	6	14	1,770	51	80,268

1/Data not available.
2/Preliminary.

amounted to 90.7 million pounds valued at a little more than $63 million. This was an increase of 19.0 percent in quantity and 17. percent in value as compared with 1963. The canned shrimp pack (drained weight) f 1964 dropped sharply, however, to 9.7 million pounds valued at $12.9 million--down 38.8 percent in quantity and 33.9 percent ir value from 1963. There was some increas over the previous year in the 1964 produc - tion of shrimp specialties (soups, stews, et

Shrimp Association of the Americas

CONVENTION HELD AT MIAMI BEACH IN JUNE 1965:

A convention was held in Miami Beach, Fla., June 20-23, 1965, jointly by the Shrim Association of the Americas and the South- eastern Fisheries Association.

The General Session of the Convention o June 21 opened with an inaugural address b the U. S. Assistant Secretary of the Interio for Fish and Wildlife. The Session also in- cluded the following talks: "Marketing Sea - food at the National Level and Highlights of the Joint Marketing Program in Florida"; "What's Going on in the Latin America Area and "Use of Radiotelephones by Fishing Ves sels."

One of the highlights of the General Ses - sion on June 22 was a talk on the "SAOTA Advertising and Promotion Program," by the Publicity Director of the National Fish - eries Institute, Washington, D. C.

The General Session on June 23, feature talks by scientists on subjects of general interest including: "A Scientific Basis for Extending the Grade 'A' Life of Fresh Iced Shrimp"; "A Proposed Program for Retaini Seafood Quality During Processing, Packing and Distribution"; "Resume of Marine Bio- logy Research in Mexico"; and "A Mid-Yea Review of the Situation and Outlook for Shrim The Session also featured a "Report on Con gress--Fishery Legislation" by the Directo of the Fishery Products Program, National Canners Association, Washington, D. C.

tes' Legislation

TIONS AFFECTING FISHERIES:
ollowing is a list of 1965 State laws and olutions passed by the State Legislatures ch have already adjourned for the year. itional legislation will be reported as ses- s end in other States. (Information Letter, ional Canners Association, June 5, 1965.)

Alaska: S. 1 requires that a primary buy- "shall purchase raw fish by the pound."

S. 112 relates to the stabilization, mainte- e, quality control, and development of the llfish industry of the State. It also creates Alaska Shellfish Marketing and Quality trol Advisory Board and provides for an essment on shellfish processors in the te to finance the Act.

S. J. R. 46 calls for a national Department Fisheries in the Executive Branch of the eral Government.

S. J. R. 48 requests full appropriation sup- for the Commercial Fisheries Research Development Act of 1964.

Maryland: H. 32 requires licensing of ain persons engaged in the business of ing oysters from persons taking or catch- oysters; also requires licenses for cer- oyster boats, vessels, and vehicles; fixes terms and fees of such licenses; and ges license fees for the taking of oysters onging or dredging.

S. 464 changes laws on issuing and sus- ing licenses of canneries and frozen food- essing plants.

S. J. R. 32 requests the Governor to appoint mmission to study problems of the oyster stry in order to insure its survival and wth.

na

ST PACIFIC ALBACORE OF 5 SEASON CAUGHT OFF CALIFORNIA:
The first albacore tuna of the 1965 Pacific son were caught off southern California by U. S. Bureau of Commercial Fisheries rtered vessel Native Sun. The vessel ght 2 albacore on June 20 and another 2 on the 21st. The catches were made at 30°41' North latitude and 121°02' West longitude, about 60 miles WNW. of Showboat Bank in a water temperature of 61.3° F.

Another chartered vessel, the Tuna Clipper, operating on June 20 at 32°18' North latitude and 121°25' West longitude in a water temperature of 59.5° F., made no catches.

Later, a U. S. Navy picket vessel was reported to have caught 2 albacore on each day during June 25-27, west of Cape Mendocino off the Northern California coast in water temperatures of 60°-62° F., at 40°30' North latitude and 133°30' West longitude. The fish were said to range from 16 to 20 pounds each.

U. S. Fishing Vessels

DOCUMENTS ISSUED AND CANCELLED:

January 1965: During January 1965 a total of 26 vessels of 5 net tons and over was issued first documents as fishing craft as compared with 33 in January 1964. There were 27 documents cancelled for fishing vessels in January 1965 as compared with 32 in January 1964.

Table 1 - U. S. Fishing Vessels[1]--Documentations Issued and Cancelled, by Areas, January 1965 with Comparisons

Area (Home Port)	January 1965	January 1964	Total 1964
	. . . .(Number). . . .		
Issued first documents 2/:			
New England	3	1	33
Middle Atlantic	1	1	11
Chesapeake	4	5	39
South Atlantic	3	5	50
Gulf	9	17	221
Pacific	6	3	141
Great Lakes	-	1	4
Hawaii	-	-	2
Puerto Rico	-	-	2
Total	26	33	503
Removed from documentation 3/:			
New England	1	1	53
Middle Atlantic	1	2	27
Chesapeake	1	4	29
South Atlantic	7	4	62
Gulf	6	9	106
Pacific	8	7	151
Great Lakes	2	5	14
Hawaii	1	-	-
Total	27	32	442

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/There were 2 redocumented vessels in January 1965 previously removed from the records. Vessels issued first documents as fishing craft were built: 6 in 1965; 11 in 1964; 1 in 1963; 1 in 1962; 1 in 1959; 1 in 1958; and 5 prior to 1951.
3/Includes vessels reported lost, abandoned, forfeited, sold, alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, January 1965 1/

Length in feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
28 . . .	-	-	-	1	1	2	4
29 . . .	-	-	-	-	1	-	1
32 . . .	-	-	-	-	-	1	1
33 . . .	-	-	-	-	1	1	2
34 . . .	-	-	1	-	1	-	2
36 . . .	-	-	-	-	1	-	1
37 . . .	-	-	1	-	-	1	2
40 . . .	-	-	1	-	-	-	1
41 . . .	-	-	1	-	-	-	1
64 . . .	-	-	-	-	1	-	1
65 . . .	-	1	-	-	1	-	2
66 . . .	-	-	-	-	2	-	2
67 . . .	-	-	-	2	-	-	2
80 . . .	1	-	-	-	-	-	1
84 . . .	1	-	-	-	-	-	1
88 . . .	1	-	-	-	-	-	1
110 . . .	-	-	-	-	-	1	1
Total .	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, January 1965 1/

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
5-9	-	-	3	1	2	-	6
10-19	-	-	1	-	3	5	9
60-69	-	-	-	-	1	-	1
80-89	-	-	-	-	3	-	3
90-99	-	-	-	1	-	-	1
100-109	-	1	-	1	-	-	2
130-139	1	-	-	-	-	-	1
140-149	1	-	-	-	-	-	1
170-179	1	-	-	-	-	-	1
210-219	-	-	-	-	-	1	1
Total	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, January 1965 1/

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
105 . . .	-	-	-	-	1	-	1
130-139.	-	-	1	-	1	2	4
165 . . .	-	-	-	-	-	1	1
200 . . .	-	-	-	-	1	-	1
218 . . .	-	-	-	-	1	-	1
220-229.	-	-	1	-	2	1	4
280 . . .	-	-	-	-	-	1	1
290 . . .	-	-	1	-	-	-	1
300 . . .	-	-	-	2	1	1	4
325 . . .	-	1	-	-	-	-	1
330 . . .	-	-	-	-	1	-	1
350 . . .	-	-	-	1	-	-	1
370 . . .	-	-	1	-	-	-	1
390 . . .	-	-	-	-	1	-	1
510 . . .	1	-	-	-	-	-	1
680 . . .	1	-	-	-	-	-	1
760 . . .	1	-	-	-	-	-	1
Total .	3	1	4	3	9	6	26

Note: For explanation of footnote, see table 1.

* * * * *

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, APRIL 1-JUNE 30, 1965:

From the beginning of the program in 1956 through June 30, 1965, a total of 1,644 applications for $42,734,194 was received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 865 applications ($19,206,671) had been approved, 546 ($12,884,077) had been declined or found ineligible, 205 ($7,859,792) had been withdrawn by the applicants before being processed, and 28 ($758,522) were pending. Of the applications approved, 323 were approved for amounts less than applied for--the total reduction was $2,025,132.

The following loans were approved from April 1 through June 30, 1965:

New England Area: David A. MacVane, Jr., Cliff Island, $5,000; Colby A. Young, Corea, $2,800; Dorothy Dodge, East Boothbay, $1,200; Michael W. Hudlin, West Southport, $2,500; all in Maine.

Pacific Northwest Area: Leonard Botten, Dockton, Wash., $14,842; Richard A. Eastman Jr., Roseburg, Oreg., $10,000; Stanley E. Pedersen, Seattle, Wash., $5,000; Antone F. Mariani, Tacoma, Wash., $20,000.

Alaska: G. Gale Allen, Cordova, $4,500; Ronald K. Sparks, Haines, $3,000; Grant Frit Jr., Kasilof, $2,400; William B. Cuthbert, Kodiak, $104,000; Kodiak Bait Company, Kodiak, $8,885; Oliver and Sarah A. Hofstad, Petersburg, $15,000; Lloyd E. Pederson, Petersburg, $10,000; Grady Lee Hamrick, Seldovia, $15,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the second quarter of 1965, a total of 5 applications for $227,244 was received. Since the program began (July 5, 1960), 77 applications were received for $7,469,992. Of the total, 63 applications were approved for $4,850,967, and 7 applications for $1,932,342 were pending as of June 30, 1965. Since the mortgage insurance program began, applications received and approved by area are:

New England Area: Received 13 ($1,464,500 approved 9 ($1,034,928).

California: Received 2 ($1,262,000), approved 2 ($1,262,000).

South Atlantic and Gulf Area: Received 49 ($[illegible]06,646), approved 43 ($1,962,969).

Pacific Northwest Area: Received 8 ($[illegible]51,250), approved 5 ($526,296).

Alaska: Received 5 ($75,596), approved 4 ($[illegible]774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through June 30, 1965, a total of 39 applications for $8,112,500 had been received. Public hearings on 18 applications were held during that period and 4 invitations to bid on a vessel were released. The first subsidy contract and construction contract for construction of a vessel under the program were completed on June 30, 1965.

U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

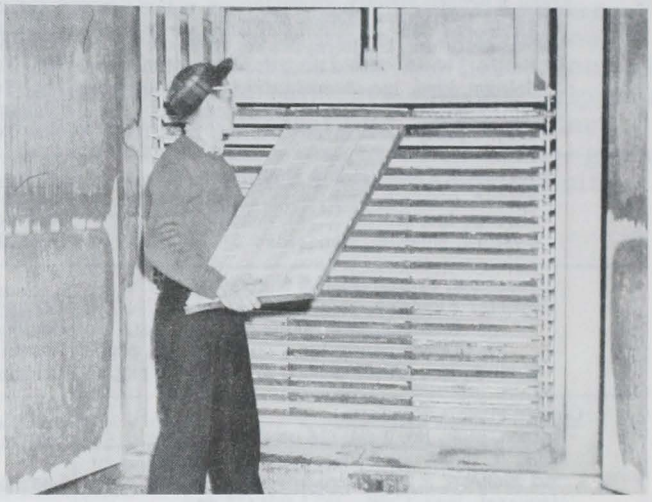
United States imports of tuna canned in brine during January 1-May 29, 1965, amounted to 12,187,083 pounds (about 580,337 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was a decline of 16 percent from the 14,[illegible]6,778 pounds (about 690,320 standard cases) imported during January 1-May 30, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-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 would be dutiable at 25 percent ad valorem.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, JUNE 1965:

Higher wholesale prices for most fresh finfish species in June 1965 than in the previous month were more than offset by a drop in fresh and frozen shrimp prices. At 108.9 percent of the 1957-59 average, the overall index for edible fishery products (fresh, frozen, and canned) was down 0.3 percent from May to June, but was 3.1 percent higher than in June 1964.



Freezing consumer-packaged scallop meats by a New Bedford firm.

The subgroup index for drawn, dressed, or whole finfish was up 6.8 percent from May to June because of higher prices for most items: Boston prices for ex-vessel large haddock were up 19.2 percent; New York City prices for seasonal supplies of western fresh halibut were up 8.0 percent and of salmon up 5.3 percent; and Chicago prices for Lake Superior whitefish were up 6.0 percent. The exception, Great Lakes round yellow pike prices were down 15.3 percent. As compared with June 1964, the subgroup index this June was higher by 6.6 percent--prices were up from a year earlier for all items except salmon: by 17.3 percent for large haddock; by 20.9 percent for western fresh halibut; and by 44.8 percent for Lake Superior whitefish. Supplies of western fresh halibut this June were especially light, with market conditions strong.

Prices at New York City for South Atlantic fresh shrimp were sharply lower (down 16 cents a pound at wholesale) from May to June due to increased production. Although June prices were higher at Boston for fresh haddock fillets (up 7.5 percent), the subgroup index for processed fresh fish and shellfish was down 7.8 percent from the previous month due solely to the lower prices for shrimp. As compared with June 1964, the subgroup index

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			June 1965	May 1965	June 1965	May 1965	Apr. 1965	June 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.9	109.2	108.8	105.6
Fresh & Frozen Fishery Products:					111.5	112.9	113.3	107.8
Drawn, Dressed, or Whole Finfish:					113.3	106.1	111.0	106.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.10	88.2	74.0	69.5	75.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.41	129.4	119.8	119.8	107.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.87	.83	121.4	115.3	115.3	124.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.62	.58	91.8	86.6	126.9	63.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.55	.65	90.1	106.4	163.7	69.6
Processed, Fresh (Fish & Shellfish):					109.6	118.9	114.5	114.8
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.36	.33	86.2	80.2	85.0	77.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.89	1.05	104.3	123.0	117.2	117.2
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.2	120.2	115.9	118.0
Processed, Frozen (Fish & Shellfish):					106.6	109.4	109.5	98.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.8	98.8	98.8	92.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.38	108.5	109.9	108.5	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	105.2	105.2	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.89	.93	105.5	109.7	111.5	96.6
Canned Fishery Products:					104.9	103.0	101.2	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.00	21.00	95.9	91.5	88.3	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	101.6	102.1
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	113.0

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

this June was down 4.5 percent--lower shrimp prices (down 11.0 percent) alone were again responsible for the decline.

The June 1965 subgroup index for processed frozen fish and shellfish was down 2.6 percent from the previous month. June prices were lower at Chicago for frozen shrimp (down 3.8 percent) and at Boston for frozen haddock fillets (down 1.3 percent); for other items in the subgroup there was no change. But prices this June were higher than in the same month a year earlier with the subgroup index up 8.0 percent. Frozen ocean perch fillets were at the same price level in each of the months shown.

The June 1965 index for canned fishery products rose 1.8 percent from the previous month (the same percentage increase as from April to May). The market outlook for canned pink salmon continued good in June, with prices up 4.8 percent from the previous month; but prices for other canned fishery products were unchanged. The subgroup index this June was up 2.6 percent from the same month in 1964--prices were higher for all canned fish except salmon (down 1.1 percent).

Youth Opportunity Campaign

FISHING INDUSTRY CAN HELP:

This summer more than 2 million American boys and girls, 16 through 21 years of age, will enter the work force. About half of that number will be seeking permanent jobs, and a start toward useful and productive participation in the economic growth of America. The balance seek temporary jobs. For the latter there is a twofold objective--first to earn money that may spell the difference between return to school and permanent dropout; and second, this early realistic exposure to orderly work patterns may materially help in more effective orientation of their formal training upon return to the classroom.

President Johnson has asked that all segments of our economy--Federal, State, and

al agencies; private firms and other or-izations--make a special effort to help in s Youth Opportunity Campaign. For ex-ple, at least 620,000 firms employ from to 100 workers. If each of these employed summer trainee per 100 workers substan-l progress could be made toward meaning-work opportunities. On the Federal sector, have been asked to apply the same ratio of summer employee for 100 regulars.

These work opportunities should be over above those that would normally be of-d, and not in lieu of regular employment. intent is to increase the work force, pro-new employment, and expose these sum-r trainees to work experiences of value in ection of their future careers.

Our fishing industry has an opportunity to inject new, vigorous blood into its structure through participation in this campaign. Much of the work is seasonal in nature, lending itself to use of these summer trainees. Also, in many parts of the country, it has been difficult to interest youths in fisheries as a possible career. If we seize this chance to expose an even larger group this year, there is a mathematical probability our "catch" in this contest for the best talent will be greater. How about it? Can you help your company by participating? If so, contact your nearest State Employment office, giving details on the type and number of training opportunities available.

SALMON OVERCOMES OBSTACLES TO GO HOME

An amazing story about the determined spirit of a Pacific salmon has come to light in California. A salmon, named "Indomitable," has accomplished one of the most phenomenal migrations ever recorded.

Early in 1964, the salmon (then 1.5 years old) was taken from his tank in the hatchery at Orick, Calif., marked by removal of a fin, and placed in a stream some miles distant. This year, the fish made its way back to the hatchery from the Pacific through one of the most difficult obstacle courses ever constructed.

"Indomitable" swam up two creeks, through a culvert under U. S. highway 101, and into a 4-inch drain pipe with a 90-degree turn. Then the fish had to leap through a $2\frac{1}{2}$-foot high pipe and over a 2-foot high wire net. At one point, the salmon had a choice of 5 pipes, 4 of which were dead-ends.

Who said there are no more big fish stories?

SCANDINAVIAN FISH-TAGGING METHOD BEING TRIED BY U. S. FISH HATCHERY

A method of tagging used extensively in the Scandinavian countries is being tried on trout by the Federal Fish Hatchery at Cortland, N. Y. Very small plastic discs are attached to the fish by means of stainless steel wire put through the neural spines just anterior to the dorsal fin. After attachment, the discs usually lie alongside the dorsal fin and apparently offer little restriction to movement of the fish. The flesh of the fish is very tolerant to the stainless steel wire, growing around and adhering to it very firmly. (The Progressive Fish-Culturist, July 1964.)