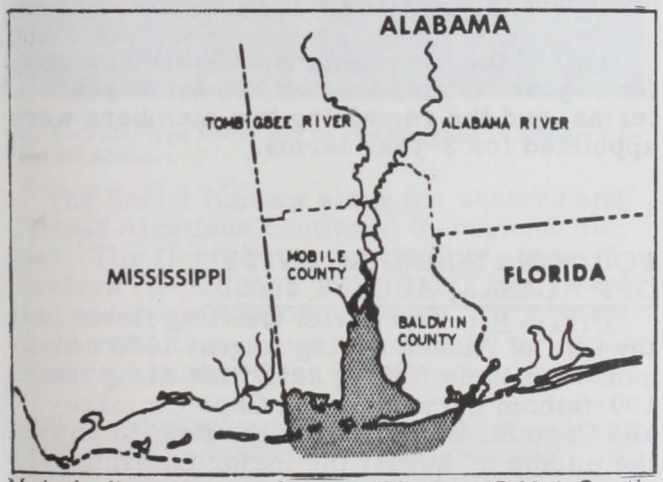
TRENDS AND DEVELOPMENTS

Alabama

LANDINGS AND FISHERY TRENDS, 1964:

During 1964, fishery landings in the Alabama coastal area, including the Alabama-Tombigbee River system were 15.1 million pounds with a value of $4.0 million--a gain of 1 percent in quantity and 7 percent in value as compared with 1963. Leading items in 1964 were shrimp (7.2 million pounds, heads-on weight), red snapper (2.4 million pounds), blue crab (1.8 million pounds), mullet (1.1 million pounds), and oysters (1.0 million pounds)--89 percent of the year's total was made up of those 5 varieties of fish and shellfish.



Marine landings concentrated in ports of Mobile and Baldwin Counties.

Shrimp: The 1964 shrimp landings of 7.2 million pounds (heads-on weight), valued at $2.6 million, were down 7 percent in quantity, but up 9 percent in value from 1963. Brown shrimp made up 62 percent of the 1964 shrimp landings; white, 36 percent; and pink, 2 percent. Compared with the previous year, the catch of white shrimp in 1964 increased 24 percent while that of brown shrimp declined 19 percent. In late June 1964, Alabama ex-vessel shrimp prices began a gradual increase on all count sizes which continued through December.

Oysters: The 1964 oyster landings of 1.0 million pounds of meats valued at $324,000 represented a slight increase in quantity but a small decline in value from 1963. Demand for shucked oysters was at about normal levels, although the usual price declines were noted during periods of peak production in 1964. The spring oyster harvest accounted for 79 percent of the total landings in 1964. The spring catches were made prior to fresh-water flooding and pollution that almost depleted the beds and reefs in the western areas of Mobile Bay and Alabama waters of the Mississippi Sound. Efforts were made by the Alabama Department of Conservation to improve those areas by planting seed oysters and shells obtained from other states. Reefs in the eastern portions of Mobile and Bon Secour Bays did not suffer extensive damage from the freshets and pollution.

Crab: Alabama fishermen landed approximately 1.8 million pounds of blue crab in 1964 valued at $110,000. Compared to 1963, that was an increase of 36 percent in quantity and 48 percent in value. Crab processing firms operated 3 to 4 days per week during the spring and fall months and 5 to 6 days per week during the peak production period of the summer months. Larger firms trucked crabs from other states to meet demand during periods of low Alabama production. Prices to crab fishermen ranged from 7 cents to 10 cents a pound in 1964. The yield of crab meat from 100 pounds of live crab varied from 12 to 20 pounds of meats with an annual average of about 15 pounds. Steady market conditions pervailed for crab meat throughout the year.

Finfish: Landings of finfish (salt- and fresh-water) at Alabama ports during 1964 were 5.1 million pounds valued at $910,000--an increase of about 5 percent in quantity and value from 1963. Red snapper was the leading item and accounted for 47 percent of the poundage and 75 percent of the value of total finfish landings in 1964. During the year new snapper vessels joined the fishing fleet, and new fishing grounds for snapper were discovered off the coast of Honduras. Black

Alabama Landings, 1964 and 1963

Species	1964		1963	
Fish	Lbs.	$	Lbs.	$
Bluefish	10,973	691	3,914	325
Buffalofish	67,695	6,937	63,485	6,643
Catfish	45,253	11,421	44,008	11,018
Croaker	3,195	271	46,635	3,152
Drum:				
Black	17,312	1,429	10,423	639
Red or redfish	19,295	3,041	20,506	3,104
Flounders	162,088	24,836	107,383	20,278
Groupers	304,542	43,524	295,413	42,267
Jewfish	118,450	11,747	41,420	3,817
King whiting or kingfish	574,759	28,892	237,749	13,665
Mullet	1,071,981	55,620	1,389,604	70,799
Paddlefish or spoonbill cat.	9,962	1,270	11,228	1,336
Pompano	1,645	827	1,146	675
Sea catfish	12,801	684	5,926	327
Sea trout:				
Spotted	64,601	16,472	53,640	13,536
White	65,120	3,264	77,793	4,109
Sheepshead:				
Fresh-water	15,401	2,319	14,809	1,945
Salt-water	34,711	2,374	14,442	956
Snapper, red	2,392,875	685,133	2,314,891	663,422
Spanish mackerel	74,139	8,358	38,977	3,549
Spot	13,659	701	35,410	1,766
Other fish	485	34	2,561	286
Total fish	5,080,942	909,845	4,831,363	867,614
Shellfish				
Crabs, blue, hard	1,761,725	110,335	1,296,710	74,736
Shrimp, heads-on	7,214,738	2,629,814	7,760,033	2,419,219
Oysters	1,005,260	324,125	995,285	352,577
Squid	4,168	350	4,047	309
Total shellfish	9,985,891	3,064,624	10,056,075	2,846,841
Grand total	15,066,833	3,974,469	14,887,438	3,714,455

Note: Landings are round weight for all species except oysters which are pounds of meats (8.75 pounds per gallon).

mullet continued as the next most important species despite a 23-percent decline in landings from 1963. That decline was offset by increased landings of flounder, grouper, jewfish, king whiting, and Spanish mackerel. Prices for most finfish species were about the same as in the previous year.

General: During 1964, the Alabama legislature adopted new regulations providing that shell oysters used for canning (hermetically sealed) have a minimum length of $2\frac{5}{8}$ inches with a 25-percent allowance for undersize oysters; the minimum size for the fresh oyster trade was established as $2\frac{7}{8}$ inches with an allowance of 5 percent for undersize oysters.

There were several changes in processing plants during the year. A fish stick producer located in Mobile Ala., transferred operations to the New England area. The only Alabama plant canning oysters and shrimp gave up that type of processing during the year.

Local shipyards were busy the entire year. Ten new vessels were constructed for local interests and several others for owners in other states. Of the 10 vessels joining the local fleet, 8 entered the shrimp fishery and 2 entered the snapper fishery.

Alaska

KING CRAB INDUSTRY BOARD NAMED BY GOVERNOR:

Alaska's Governor Egan appointed six crab industry leaders as board members under the newly passed King Crab Marketing and Quality Control Act. The 1965 Alaska Legislature created the board as an industry watchdog to maintain the quality of king crab produced in Alaska and to develop markets for the product. King crab processors are to be assessed on the basis of raw crab produced to pay the cost of the board's operations after 51 percent of the processors based on both number and quantity approve its program.

Two of the board members were appointed for 1-year terms, another two for 2-year terms, and the remaining two members were appointed for 3-year terms.

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FOREIGN FISHING ACTIVITY OFF ALASKA, AUGUST 1965:

U. S. S. R.: The Soviet trawling fleets in the Gulf of Alaska during August 1965 concentrated their fishing activities along the 100-fathom curve between Cape Ommaney and Cape St. Elias. From the first to about the middle of August the major trawling efforts were centered from Cape Spencer to Cape St. Elias. During the first three weeks in August, a fleet made up of about 25 trawlers and 5 reefers fished in southeast Alaska off Baranof and Chichagof Islands. By the end of the month that fleet had diminished to about 6 trawlers and 1 reefer vessel.

The size of the Soviet fleet fishing in the eastern Gulf of Alaska from Cape Spencer to Cape St. Elias remained fairly stable. Some 70 trawlers, 16 reefers, and various support vessels operated in the area during August. Soviet catches in the Gulf of Alaska were predominantly Pacific ocean perch.

Fig. 1 - Older type Soviet side trawler operating in offshore waters off Alaska.

The Soviet fishery along the eastern and Central Aleutians continued throughout August. The fleet there consisted of about 15 trawlers (including 8 to 10 BMRT's), 3 reefers, and a few support vessels. This was a slight reduction compared with the previous month's Aleutian fleet in that area.

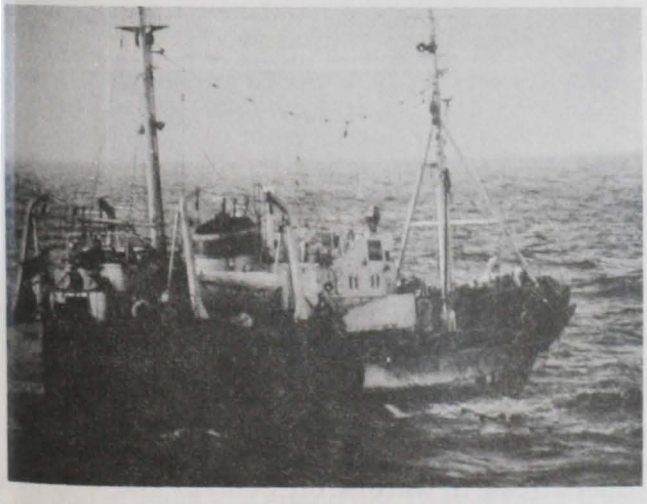


Fig. 2 - More modern type of Soviet trawler (SRT-M) operating in Gulf of Alaska.

In the western Aleutians a small fleet operated throughout August. It consisted of about 6 BMRT stern trawlers accompanied by a few reefers and support vessels.

Late in July it was estimated that 5 Soviet SRT-M trawlers were shrimp fishing near Lighthouse Rocks east of the Shumagin Islands. That fleet was down to 2 trawlers by the first week in August and remained at that level throughout the month.

Fig. 3 - Soviet fish factoryship about 150 feet long.

Three Soviet whaling fleets operated off Alaska during the month. The factoryship Vladivostok worked in the eastern, central, and western Gulf of Alaska and the Aleut and Dalniy Vostok operated in the central and western Aleutians. Each whale factoryship was accompanied by about 9 whale killer vessels.

Japan: The Chichibu Maru and her 12 accompanying trawlers reportedly left the offshore waters off Alaska early in August and returned to Japan. A Japanese news article reported the Chichibu Maru was scheduled to sail from Hakodate, Japan, for the Bering Sea on or about August 30. She was to be accompanied by 8 trawlers of 260-ton capacity.

Fig. 4 - Japanese trawler fishing for mothership operating in offshore waters off Alaska.

The Japanese factory trawler Akebono Maru No. 71 returned to the waters off Alas-

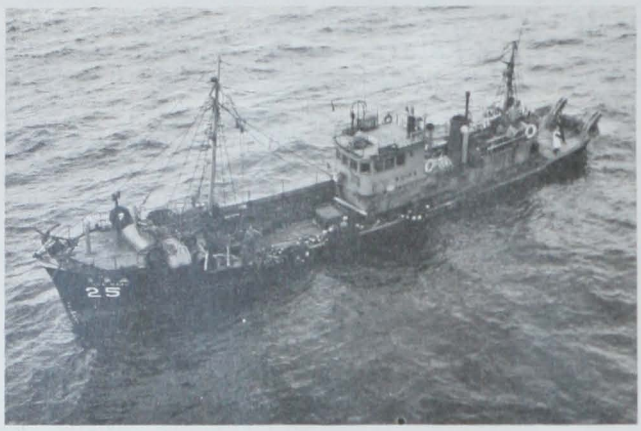


Fig. 5 - Japanese mothership operating in North Pacific and Bering Sea.

ka around the middle of August and fished in the vicinity of Amukta Pass in the central Aleutians for the rest of the month.

The factory trawlers Dainshin Maru No. 12 and Takachiko Maru continued fishing generally along the 100-fathom curve between Albatross Bank and the Middleton Island area. A third factory trawler, the Sumiyoshi Maru No. 12 was reported to have ended fishing operations early in August. The smaller Japanese trawlers Taiyo Maru No. 37, Fukuho Maru No. 2, and the Fukushin Maru No. 1 remained in the Gulf during August. They had been fishing the Albatross Bank region.

Fig. 6 - Catch of bottomfish on the deck of a Japanese trawler in North Pacific.

During August the three Japanese fish meal factoryships continued fishing in the area about 100 miles northwest of the Pribilof Islands. They were accompanied by a total of 65 trawlers.

The Japanese shrimp factoryship Einen Maru and her 15 trawlers continued to operate throughout August in the area 50 to 100 miles north of St. Paul Island.

Fig. 7 - A Japanese tangle-net setting trawler attached to king crab factoryship in Bering Sea.

The Japanese king crab factoryships Tokei Maru and Tainichi Maru, each accompanied by 5 tangle-net setting trawlers, operated in the Bering Sea about 100 miles northwest of Port Moller during the first half of August. The Tainichi Maru was reported scheduled to leave for Japan on or about August 14. Catches by the Tokei Maru had not been as good as those of the Tainichi Maru and she remained on the crab grounds until about the end of the month.

Fig. 8 - Japanese whale factoryship operating in waters off central and western Aleutian Islands.

In late August the Japanese whale factoryship Nichiei Maru and her 7 killer vessels reportedly were beyond Alaskan waters and it was assumed they had returned to Japan. The other two Japanese whaling fleets, each accompanied by 7 whale killers, continued operations in waters off central and western Aleutian Islands.

* * * * *

1965 HERRING FISHERY DOWN SHARPLY:
The 1965 southeastern Alaska commercial herring operation, limited to Washington Bay, was yielding poor catches. By August 22, only 3,000 tons had been landed compared to 21,000 tons at the same date in 1964. The catch was composed of age V fish and older, with ages VII and VIII accounting for more than 40 percent. A strong incoming age class was not evident.

* * * * *

SALMON FISHING SEASON ABOUT OVER:
The 1965 salmon season ended in August except for a few areas in southeastern Alaska where seiners, gill-netters, and trollers continued fishing a while longer.

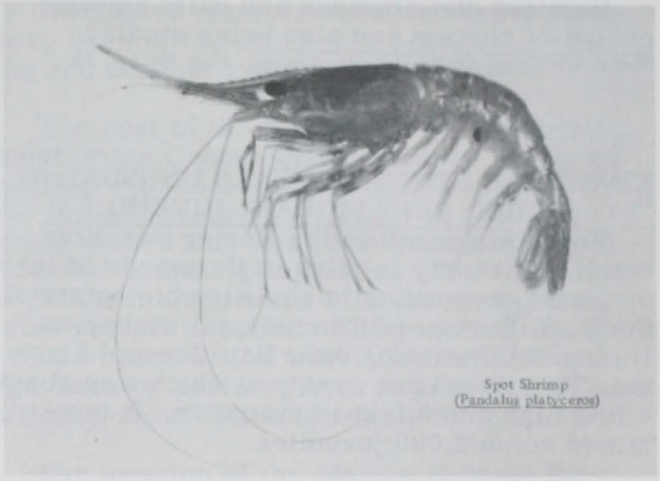
Alaska Fishery Investigations

PINK SHRIMP VERTICAL MIGRATIONS:
Vertical strings of pots pulled every 3 hours at the Kasitsna Bay station showed that in 50 fathoms of water the pink shrimp were at less than 12 fathoms off the bottom in mid-afternoon. But they occurred at all levels to the surface by midnight, with a maximum concentration at 12 fathoms below the surface. By 6 a.m. the shrimp had returned to less than 24 fathoms off the bottom.

* * * * *

SHRIMP LIFE HISTORY STUDIES:
Alaskan pink shrimp (Pandalus borealis) change their sex from male to female. The reason for this is not known and there are other aspects of shrimp life history about which little is known. To learn more about the habits and movements of commercially important Alaskan shrimp, basic studies are being carried out by biologists of the U. S. Bureau of Commercial Fisheries Field Station at Kasitsna Bay near Homer, Alaska. Several species of shrimp--the pink, humpy, coon stripe, spot, and sidestripe--are being studied.

The studies have shown that young specimens of pink shrimp in Alaska are always male. Then when they are 4 years old in the North they become females, hatch their first brood of eggs and spend the rest of their lives as functioning members of that sex. When it


Spot Shrimp
(Pandalus platyceros)

is time to change sex, the male parts atrophy and the female organs develop. Most of the change takes place in the spring of the year. However, pink shrimp in southern Alaska in the area of Petersburg, Wrangell, and Auke Bay change from males to females in their third year. Again the reason for this is not known. Scientists are trying to determine whether or not the pink shrimp females survive after producing one brood of young, and if so, whether they live to produce one or more subsequent broods.

The food chain of shrimp is not solved either. Their choice of food is not known at present.

It is known that Alaskan pink shrimp prefer a green mud bottom and a flat surface. However, the shrimp are not confined to the floor of the sea. They make nightly migrations to the surface. They are pelagic especially at night. When daylight hours approach, the shrimp head for the ocean depths again.

Life history and ecology studies on pink shrimp make up a new research program started by the U. S. Bureau of Commercial Fisheries 3 years ago. The research vessel Sablefish is being used in the shrimp investigations. An otter trawl is used for shrimp sampling. There are three sampling sites and each is sampled twice a month with pot and trawl gear.

In addition to the established sampling procedure, an effort is being made to locate the environment of postlarval, young-of-the-year pink shrimp which have not been taken in samples to date.

Vertical distributions and daily activity cycles of shrimp are also being studied.
Note: See Commercial Fisheries Review, May 1963 p. 18.

* * * * *

KING CRAB STUDY REVEALS UNUSUAL "STACKING" BEHAVIOR OF JUVENILES:

Young king crab in the Bering Sea often stack up like hay in piles of thousands of individuals, according to shellfish biologists of the U. S. Bureau of Commercial Fisheries Biological Station at Auke Bay (Juneau) Alaska. They found one crab pod which was about 4 feet high and 8 feet in diameter. It contained some 2,000 juveniles.

"The stacking of the young king crabs is an odd bit of behavior which is not understood. They stack up at intervals, disperse, and stack up again," said the scientist in charge of the shellfish investigation. "This clumping or stacking of young crabs might be a protective mechanism since this crab congestion takes place in barren areas devoid of plant growth. It might also protect some of the crabs that are molting."

Observing juvenile king crab is an important part of growth and molting studies. It was not known until recently how often young king crab molt, or the age-class of adult king crab. The investigation will help explain the life history of this important commercial species about which little is known.

* * * * *

SALMON EARBONES REVEAL AGE IN STUDY OF SOCKEYE RUN TO KARLUK LAKE:

It's a good thing salmon have ear bones. They not only serve the fish, of course, but also aid science by revealing the age of fish--valuable information to researchers of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Auke Bay, Juneau, Alaska.

In making the age determination, the ear bone--which is smaller than a fingertip--is removed from the fish and placed under a low-powered microscope. Concentric white rings are readily seen. Those are counted. As one ring is laid down for each year of life, the number of rings reveals the age of the fish.

The age studies by biologists of the U. S. Bureau of Commercial Fisheries are part of a research program to find reasons for the long-term decline in sockeye salmon spawning runs to Karluk Lake in Southeastern Alaska.
Note: See Commercial Fisheries Review, Sept. 1965 p. 19.

American Samoa

COMPOSITION OF TUNA FLEET OPERATING FROM AMERICAN SAMOA:

Tuna long-line vessels fishing out of American Samoa as of July 1, 1965, were reported to total 67, including 36 Japanese, 17 South Korean,

Fig. 1 - Setting long line aboard a Japanese tuna long-liner near American Samoa.

and 14 Formosan vessels. It was reported by Japanese trading firms that the number of South Korean and Formosan vessels fishing out of Samoa was steadily increasing and those ves-

Fig. 2 - Unloading tuna from a long-liner at American Samoa.

sels were able to compete with Japanese vessels since their wage scales were lower. (Suisan Keizai Shimbun, August 10, 1965.)

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TRANSSHIPPING TUNA TO JAPAN:

The Kanagawa Prefectural Tuna Fishermen's Cooperative Association in Japan has studied a plan which it hoped to implement in September 1965 whereby Japanese tuna vessels operating out of American Samoa will transfer tuna considered not suitable for canning and other species (such as spearfish and sharks) to a Japanese carrier vessel for shipment to Japan. The plan provides for a cargo vessel to call at American Samoa once a month to pick up the fish. The carrier firm's vessels presently call at such places as Tahiti, Fiji Islands, and Noumea (New Caledonia). (Katsuo-Maguro Tsushin, September 1, 1965.)

California

MARINE RESEARCH CENTER BEING ESTABLISHED BY UNIVERSITY OF SOUTHERN CALIFORNIA:

A major Marine Science Research Center is being established by the University of Southern California at Santa Catalina Island, 21 miles off the southern California mainland. The first unit of the Center will be a Marine Biology Laboratory. Plans call for construction of the laboratory to begin in the fall of 1965 and to be completed in late 1966. The Marine Biology Laboratory will provide the base for development of an extensive research complex.

The Center ultimately is to include research buildings, laboratories, and other facilities for both basic and applied research in various phases of marine science. Development plans envision the involvement of private industry, as well as Government, for long-range programs of research and development in marine science and engineering.

Through its Allan Hancock Foundation, the University of Southern California has assumed the prime responsibility for planning, developing, and operating the Center. Other universities and colleges in the area are cooperating actively and will participate in the programs. Support and cooperation has been sought and received from the University of California at Los Angeles, Riverside, and Irvine, the California Institute of Technology, Pomona College, Occidental College, and the California State College System. Each of those institutions has officially designated members of a Scientific Advisory Committee which will counsel on teaching and research at the Center.

The cost of the first phase in the development of the Center will amount to nearly $2 million with about half of that sum going for the initial research building. A $500,000 grant toward this work has been made by the National Science Foundation. The University of Southern California will match that sum from private sources. The construction of access roads and of water, power, and sewage lines by private firms represents an additional contribution of nearly $1 million.

The location of the Marine Science Research Center at Fisherman's Cove on the eastern side of Catalina is regarded as an excellent site for marine studies. Among its advantages are: (1) diversity and abundance of temperate and subtropical marine plants and animals; (2) freedom from water pollution; (3) excellent water clarity; (4) comfortable water temperatures and a climate favorable to year-round operations; and (5) immediate access to a great variety of both shallow and deep oceanic environments.

Close proximity of the Center to the educational, scientific, and industrial components of southern California further serve to qualify it as an ideal base for marine research. (News Bureau, University of Southern California.)

Columbia River

COLUMBIA BASIN INTER-AGENCY COMMITTEE MEETS TO DISCUSS FISHERY RESOURCES:

The Columbia Basin Inter-Agency Committee planned to meet in Seattle, Wash., October 6, 1965, to consider fishery resources of the Columbia. Plans called for discussions covering fish passage research, relationships of the Columbia River to the international fishery in the Pacific Ocean, fishery implications of Canadian water storage, and other topics.

The Columbia Basin Inter-Agency Committee is made up of representatives of seven Federal agencies and the Governors of Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Federal Purchases of Fishery Products

FEDERAL SPECIFICATION PROPOSED FOR FRESH AND FROZEN SHUCKED RAW OYSTERS:

The U. S. Bureau of Commercial Fisheries has requested comments from the oyster industry on a proposed Federal Specification for Oysters--Raw, Shucked: Fresh (Chilled) and Frozen. Federal Specifications are designed to meet the requirements of Federal agencies for purchases of food products.

Copies of the proposed specification were distributed to the United States oyster industry for review and comments were to be submitted by September 30, 1965.

One feature of the proposed specification in regard to Military purchases is the inclusion of microbiological standards for market oysters as adopted at the 1964 Shellfish Sanitation Workshop of the U. S. Public Health Service. The Army has asked that those be used for their procurement.

Great Lakes Fisheries Explorations and Gear Development

LAKE MICHIGAN TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 28 (August 10-28, 1965): An 18-day exploratory fishing cruise in Green Bay and northern Lake Michigan by the U. S. Bureau of Commercial Fisheries research vessel Kaho was completed on August 28, 1965. The purpose of the explorations is to extend knowledge on the seasonal distribution, abundance, and availability to trawl fishing gear of important commercial fish stocks in the Great Lakes. This work is part of the Bureau's multidiscipline effort to help Great Lakes fishermen overcome problems associated with changes in fish populations and various economic setbacks.

Catches made during this cruise provided further evidence of large stocks of Lake Michigan fish which are now only partially fished. Good catches of alewife, a recent invader of Lake Michigan from the lower lakes, were obtained in Green Bay and Grand Traverse Bay. Up to 1,100 pounds per half-hour drag were caught in both areas. A good catch of 610 pounds of large chubs was made off Port Inland. Green Bay yielded up to 520 pounds of smelt per drag. Catches of 460 and 350 pounds of sucker were made in Green Bay and Little Traverse Bay, respectively.

A total of 23,743 pounds of fish was caught in 39½ hours of fishing time during the cruise. A general breakdown by species comprising principal portions of the total catch is shown in table.

Species Composition of Total Catch Made by M/V Kaho During Cruise 28

Species	Green Bay		Northern Lake Michigan	
	Pounds Caught	Percentage of Area Catch	Pounds Caught	Percentage of Area Catch
Alewife	10,970	80	3,964	39
Chub	24	-	3,878	39
Sculpin	-	-	821	8
Smelt	1,511	11	594	6
Sucker	1,025	8	503	5
Other	157	1	296	3
Total	13,687	100	10,056	100

A noteworthy sidelight of the cruise was the capture of 53 of the 1.3 million lake trout planted in northern Lake Michigan in summer 1965 under the Great Lakes Fishery Commission lake trout restoration program. The lake trout recaptures will be helpful in determining the survival, growth rates, and dispersal of the newly stocked fish.

FISHING OPERATIONS: A total of 80 drags was completed with a 52-foot (headrope) fish trawl, 51 in the open lake, 22 in Green Bay, and 7 in Grand and Little Traverse Bays. All drags were of 30 minutes each except 4 which were ended early due to snags, rough bottom, or set fishing gear. Major trawl damage occurred when the net snagged at 10 and 35 fathoms off Ludington, Mich.

FISHING RESULTS IN NORTHERN LAKE MIGHICAN: Alewife were availalbe in relatively small quantities at all of the open lake stations. The largest catch of 400 pounds was made off Beaver Island at 12 fathoms. No alewife at all were caught off Frankfort since rough bottom conditions prevent trawling at depths shallower than 25 fathoms. Alewife fishing was better in Grand Traverse Bay and Little Traverse Bay where 1,100 pounds and 450 pounds, respectively, were taken at 14 and 15 fathoms.

Chubs were caught in commercially significant quantities near Manistique where 610 pounds (160 pounds of No. 1 and jumbo size) were caught at 20 fathoms off Seul Choix Point. Other species caught in amounts of

100 pounds or more included sculpin, smelt, stickleback, and sucker. Of the small lake trout caught, 52 ranging in size from 5.0 to 8.3 inches, were taken in the open lake and the Traverse Bays at depths ranging from 10 to 35 fathoms.

Species other than alewife and chubs taken in northern Lake Michigan included, among others: sculpin, smelt, white sucker, and common whitefish.

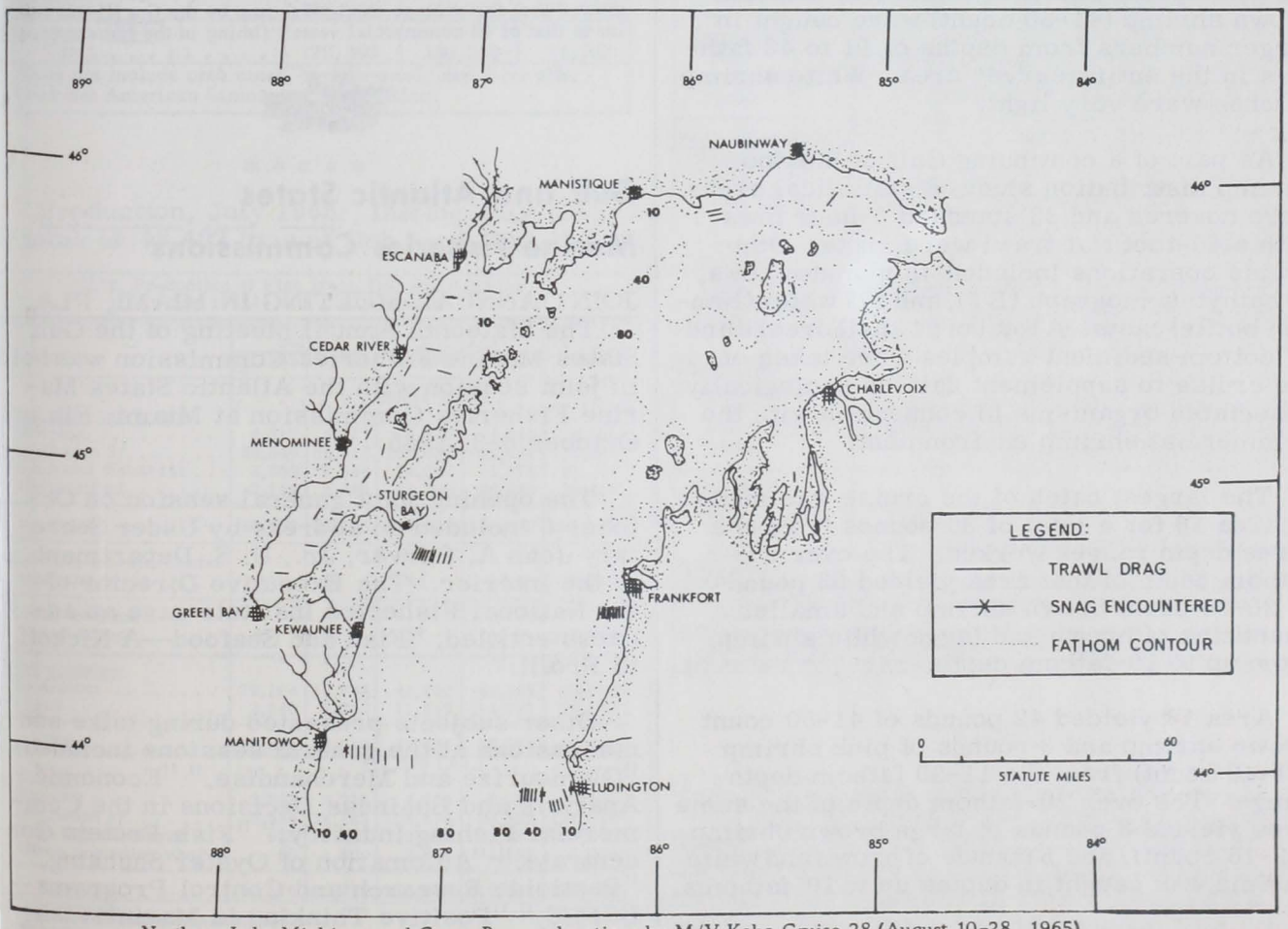
FISHING RESULTS IN GREEN BAY: Alewife were taken in all of the 22 trawl drags in Green Bay accounting for 80 percent of the total catch. Catch rates ranged from 20 to 1,100 pounds and averaged 500 pounds a half hour. A total of 10,970 pounds was landed in 11 hours' effort with the most productive depths between 10 and 15 fathoms.

Smelt were the next most abundant species in Green Bay and comprised 11 percent of the total, or 1,511 pounds. They occurred in 17 of the drags in amounts from 2 to 520 pounds with an average catch of 90 pounds per drag. The best smelt catch was in 10 fathoms $4\frac{1}{2}$ miles SE. of Pestingo Point.

Sucker were also caught in commercially significant amounts in Green Bay, particularly in the southern portion. Amounts up to 460 pounds per drag were landed with an average catch of 80 pounds for the 13 drags in which sucker occurred. A total of 1,025 pounds, or 8 percent, of the catch was sucker, of which 57 percent was white sucker and 43 percent longnose sucker. The best landing of 460 pounds was in 10 fathoms just south of Chambers Island.

Yellow perch occurred in 9 drags but in amounts up to only 20 pounds. One small fin-clipped lake trout was recovered in 22 fathoms near Washington Island.

Species other than alewife, smelt, and sucker in the Green Bay trawl catch included,



Northern Lake Michigan and Green Bay explorations by M/V Kaho Cruise 28 (August 10-28, 1965).

among others: yellow perch, common whitefish, burbot, chub, and cisco.

OTHER DATA: Surface water temperatures taken in Lake Michigan during the cruise ranged from 50° to 64° F. and in Green Bay from 65° to 69° F. Fishing (bottom) temperatures ranged from 37° to 53° F. in Lake Michigan and 46° to 69° F. in Green Bay.

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

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-32 (August 10-21, 1965): Brown shrimp were predominant in the catches made during this cruise by the chartered research vessel Gus III of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. As a result of offshore migrations from nursery areas during late spring and early summer, medium brown shrimp (41-50 count) were caught in larger numbers from depths of 11 to 40 fathoms in the entire survey area. White shrimp catches were very light.

As part of a continuing Gulf of Mexico shrimp distribution study, 8 statistical areas were covered and 33 standard 3-hour tows with a 45-foot flat trawl were made. Other cruise operations included 48 plankton tows, 49 bathythermograph (BT), and 177 water (Nansen bottle) casts. A total of 24 shell dredge and 17 bottom sediment samples were taken on the cruise to supplement data on ecologically associated organisms in connection with the commercial shrimp environment.

The largest catch of the cruise was made in area 16 for a total of 80 pounds from the three depth ranges worked. The over 20-fathom depth of that area yielded 63 pounds of 26-30 count brown shrimp and smaller quantities of brown and large white shrimp from up to 10-fathom depth.

Area 18 yielded 42 pounds of 41-50 count brown shrimp and 3 pounds of pink shrimp (31-40 count) from the 11-20 fathom depth range. The over 20-fathom depth of the same area yielded 8 pounds of large brown shrimp (12-15 count), and 5 pounds of brown and white shrimp was caught in depths up to 10 fathoms.

The over 20-fathom depth of area 13 yielded 26 pounds of 31-40 count brown shrimp. Other depths in the same area accounted for 10 pounds of very small brown shrimp and a few pounds of 15-20 count white shrimp.

Although white shrimp catches were quite small in all areas worked, they almost consistently ran to large sizes (15-20 count), mostly from the up to 10-fathom depth range. Pink shrimp taken on the cruise was from three areas--mostly 31-40 count.

The vessel also occupied the third in a series of 24-hour current measurement stations in 8 fathoms of water south of Morgan City, La.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, September 1965 p. 29.

(3) Following completion of cruise GUS-30 during June in Gulf of Mexico offshore waters, the Gus III was used to carry out other types of work (Cruise GUS-31). The work included studies of the selective characteristics of the cod end of shrimp nets, comparisons of the relative fishing power of the Gus III and commercial shrimp trawlers, and shrimp staining experiments. The results of that work are to be analyzed. The comparative studies showed that the average catch of shrimp by the Gus III was similar to that of 40 commercial vessels fishing in the same area.

Gulf and Atlantic States Marine Fisheries Commissions

JOINT ANNUAL MEETING IN MIAMI, FLA.:

The Sixteenth Annual Meeting of the Gulf States Marine Fisheries Commission was held in joint session with the Atlantic States Marine Fisheries Commission at Miami, Fla., October 6-8, 1965.

The opening joint general session on October 6 included an address by Under Secretary John A. Carver, Jr., U. S. Department of the Interior. The Executive Director of the National Fisheries Institute gave an address entitled, "Fish and Seafood--A Kickoff to Profit."

Other subjects presented during talks and discussions at the general sessions included: "Glamourize and Merchandise," "Economic Analysis and Business Decisions in the Commercial Fishing Industry," "Fish Protein Concentrate," "Automation of Oyster Shucking," "Pesticide Research and Control Programs--USPHS," "Positive Thinking in Marine Fish-

ery Management," and "Commercial Fisheries Research and Development Act of 1964."

Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES: Production by Areas, August 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for August 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, August 1965 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
August 1965:			
East & Gulf Coasts	34,853	31,511	17,342
West Coast 2/	2,494	1,839	-
Total	37,347	33,350	17,342
Jan.-Aug. 1965: Total	173,831	148,198	70,038
Jan.-Aug. 1964: Total	175,360	140,766	71,707

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

* * * * *

Production, July 1965: During July 1965, a total of 48,462 tons of fish meal and 40.6 million pounds of marine-animal oil was produced in the United States. Compared with July 1964 this was an increase of 3,286 tons of fish meal and about 6.8 million pounds of marine-animal oil. Fish solubles production amounted to 18,524 tons--an increase of 510 tons as compared with July 1964.

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

Product	July		Jan.-July		Total
	1/1965	1964	1/1965	1964	1964
	(Short Tons)				
Fish Meal and Scrap:					
Herring	4,317	3,317	6,710	4,960	8,881
Menhaden 2/	38,546	34,018	103,022	99,448	160,349
Tuna and mackerel	2,855	2,344	14,252	11,176	21,113
Unclassified	2,744	5,497	12,500	26,243	34,809
Total	48,462	45,176	136,484	141,827	225,152
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	10,100
Grand total meal and scrap	3/	3/	3/	3/	235,252
Fish solubles:					
Menhaden	16,184	15,774	41,256	42,362	68,738
Other	2,340	2,240	11,440	14,677	24,558
Total	18,524	18,014	52,696	57,039	93,296
	(1,000 Lbs.)				
Oil, body:					
Herring	3,242	3,716	4,255	5,937	10,354
Menhaden 2/	35,554	28,183	105,474	99,325	157,730
Tuna and mackerel	623	479	2,307	1,987	4,816
Other (including whale)	56	1,400	2,812	5,153	7,298
Total oil	40,575	33,778	114,848	112,402	180,198

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

* * * * *

Major Indicators for U. S. Supply, July 1965: United States production of fish meal and fish oil in July 1965 was higher by 7.3 and 20.1 percent, respectively, as compared with July 1964. Production of fish solubles was higher by 2.8 percent.

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

Item and Period	1/1965	1964	1963	1962	1961
	(Short Tons)				
Fish Meal:					
Production:					
July	48,462	45,176	38,492	55,602	63,435
Jan.-July 2/	136,484	141,827	129,544	177,438	165,937
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
July	18,693	28,863	43,223	25,857	18,710
Jan.-July	228,551	285,292	225,157	166,743	126,536
Year	-	439,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
July	18,524	18,014	17,709	22,207	22,589
Jan.-July 2/	52,696	57,039	60,534	73,714	62,789
Year	-	93,926	107,402	124,649	112,254
Imports:					
July	123	1,506	330	306	708
Jan.-July	3,357	3,557	2,769	4,596	1,927
Year	-	4,505	7,112	6,308	6,739
	(1,000 Lbs.)				
Fish Oils:					
Production:					
July	40,575	33,778	28,990	47,695	57,239
Jan.-July 2/	114,848	112,402	98,579	143,317	146,264
Year	-	180,198	185,827	250,075	258,118
Exports:					
July	16,145	40,449	29,343	128	4,421
Jan.-July	46,315	96,588	127,149	63,133	72,549
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 or during the first 7 months of 1965.

* * * * *

U. S. FISH MEAL AND SOLUBLES: Production and Imports, January-July 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 7 months in 1965 amounted to 365,035 short tons--62,084 tons (or 14.5 per-

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

Item	Jan.-July 1/1965	Jan.-July 1964	Total 1964
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	103,022	99,448	160,349
Tuna and mackerel	14,252	11,176	21,113
Herring	6,710	4,960	8,881
Other	12,500	26,243	44,252
Total production	136,484	141,827	235,252
Imports:			
Canada	24,906	34,509	54,769
Peru	192,921	227,325	348,025
Chile	5,128	10,587	12,942
Norway	25	-	-
So. Africa Rep.	1,900	10,738	18,581
Other countries	3,671	2,133	4,826
Total imports	228,551	285,292	439,143
Available fish meal supply	365,035	427,119	674,395
Fish Solubles:			
Domestic production 2/	52,696	57,039	93,296
Imports:			
Canada	1,006	1,162	1,553
So. Africa Rep.	-	860	987
Other countries	2,347	1,535	1,965
Total imports	3,353	3,557	4,505
Available fish solubles supply	56,049	60,596	97,801

1/Preliminary.
2/50-percent solids.

cent) less than during the same period in 1964. Domestic production was 5,343 tons (or 3.8 percent) less, and imports were 56,741 tons (or 19.9 percent) lower than in January-July 1964. Peru continued to lead other countries with shipments of 192,921 tons.

The United States supply of fish solubles during January-July 1965 amounted to 56,049 tons--a decrease of 7.5 percent as compared with the same period in 1964. Domestic production dropped 7.6 percent and imports of fish solubles decreased 5.7 percent.

Inland Fisheries Explorations and Gear Development

OAHE RESERVOIR TRAWLING STUDIES: Reservoir Research Vessel "Hiodon" Cruise 1 (July 14-22, 1965): To delineate areas suitable for bottom trawling, test the effectiveness of commercial trawls as fishing gear, and collect catch and biological data were the specific objectives of this cruise in the upper one-third of Oahe Reservoir. This 8-day exploratory trawling operation by the new reservoir fishery research vessel Hiodon of the U. S. Bureau of Commercial Fisheries was completed on July 22, 1965. Tows were made between reservoir miles 122 and 183 of the Reservoir in South and North Dakota.

Fish catches were low in most areas fished. Nineteen species of fish were taken but crappie, yellow perch, carp, drum, and shovelnose sturgeon dominated the catches. No species or sizes of fish were taken that normally are marketed by the existing commercial fisheries.

New reservoir exploratory fishing vessel Hiodon. Leaving the Kalamazoo River pier near Saugatuck, Mich., in mid-April 1965 to begin her 2,000-mile trip by lake, river, and highway to Oahe Reservoir--one of the largest Missouri River impoundments.

FISHING OPERATIONS: A total of 8 tows was made with a 55-foot (headrope length) Gulf of Mexico-type fish trawl and 14 tows were made with a 35-foot trawl of similar design. Mesh size (extended measure) of the cod end of the 55-foot trawl was $1\frac{1}{4}$ inches and $\frac{1}{2}$ inch in the 35-foot trawl. Nineteen tows were made over the old river channel and 3 tows were made over inundated bottomlands. Depths trawled ranged from 12 to 48 feet. All tows were 15 minutes each except 5 which were ended when the net became fouled on bottom obstructions. Bottom topography and depths were recorded continuously with a high resolution "white line"-type depth-recorder.

FISHING RESULTS: The total catch in 22 tows was 1,394 fish weighing 700 pounds. The average catch per tow was 31.7 pounds. The number of tows with catches of the most common fish were: 17 with carp; 13 with shovelnose sturgeon and fresh-water drum; and 11 with yellow perch. Highest catches per tow for tows catching fish were crappie 10.6 pounds, carpsucker 10.3, carp 9.5, shovelnose sturgeon 6.2, and drum 5.3 pounds.

The 35-foot trawl caught 44.4 pounds of fish per tow and the 55-foot trawl took 7.7

pounds per tow. Tows over inundated bottomlands caught fish at much higher rates than over the older river channel.

The cruise was beset with a number of operational difficulties which were encountered during the cruise. Difficulties were in the slow speed at which the 55-foot trawl was towed and pulled to the boat at the completion of each tow. The difference in the catch of the two sizes of trawl may have been due to the difficulty in towing and pulling in the 55-foot trawl at fast speeds--a problem less serious with the 35-foot trawl. The vessel returned early to Mobridge to make some minor engine adjustments.

Two trawls were badly torn during the cruise. Trawls frequently picked up large quantities of organic debris, bushes, logs, and on several occasions, large free-floating trees. Tows over carefully selected bottomlands yielded greater catches and less debris than tows over the old river channels. Continued trawling throughout the reservoir is certain to establish conditions for best fishing results and awareness of operational problems.

OTHER DATA: Hydrographic data collected showed that surface waters were progressively warmer and secchi disc readings higher from reservoir mile 183 to reservoir mile 122. Surface water temperatures ranged from 65° F. to 77° F., and secchi disc readings ranged from 2 to 10 feet.

Reservoir Research Vessel "Hiodon" Cruise 3 (August 24-September 1, 1965): This later cruise by the Hiodon in the Oahe Reservoir, between reservoir miles 122 and 131, ended early because of severe trawl damage caused by submerged free-floating trees.

FISHING OPERATIONS: The trawls used during the cruise were the same as those used on the earlier cruises. Only 7 complete 15-minute tows were made with the 35-foot trawl and 2 tows with the 55-foot trawl. Depths trawled ranged from 18 to 48 feet. Eight tows were made over old fields and one over the old river channel.

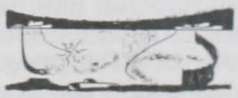
FISHING RESULTS: The total catch of the 35-foot trawl consisted of 1,078 fish (older than age group II) weighing 703 pounds. The average catch per tow was 154 fish weighing 100 pounds. Single catches ranged from 9.6 to 180.8 pounds. The average catch (in pounds) of each species per tow was: carp 62.9; carpsucker 12.3; perch 7.0; channel catfish 3.6; drum 3.4; northern pike 3.2; and 12 other species 8.0 pounds. The average individual fish weight (in pounds) of several species was: carp 1.6; carpsucker 1.5; yellow perch 0.1; channel catfish 0.4; northern pike 4.5; drum 0.4; and smallmouth buffalo 1.1.

Only 9 yearling fish were caught in the 35-foot trawl. The most abundant young-of-the-year fish taken were black bullhead, yellow perch, white bass, crappie, and drum. The two 15-minute tows made with the 55-foot trawl yielded 309 fish weighing 419.6 pounds. Average per tow was 154 fish and 210 pounds. Carp made up 83.4 percent of the catch by weight. The carp averaged 1.8 pounds in weight--mostly fish of the 1962 year-class.

Trawl catches on this cruise ranged from 9.6 to 211.7 pounds and averaged 124.7 pounds. Carp made up 70 percent of the total catch. Although a number of factors affect the rate of catch, the amount of debris on the bottom in many areas greatly reduces the catch. Apparently water currents move toward and down the old Missouri River channel which results in the deposition of organic materials on the bottom of these seemingly prime trawling areas. Bushes, shreds of cottonwood tree bark, twigs, and grass often are picked up by the trawl in such quantity that the open face of the cod end of the trawl may be completely choked with bushels of debris. The problem is less serious over old bottomlands and least serious over newly inundated pasture land. That tows are sometimes made over old haystacks and manure piles, or through barbed wire fences is evident when the trawls are pulled aboard. Submerged free-floating trees may be found anywhere and may shift location daily.

Charts are used to locate and delineate the various bottomlands, pastures, forested areas, and old river channel. The depth-finder is used over probable trawling areas to define depths, contours, and area that may be trawled. Free-floating submerged trees and bushy areas usually cannot be detected on the depth-recorder.

Note: See Commercial Fisheries Review, August 1965 p. 42.



Marketing

FISH 'N' SEAFOOD PARADE:

During October 1965 the fishery industry conducted an intensive advertising and publicity campaign and provided point-of-purchase material to acquaint food buyers with benefits of serving fish and seafoods.

As part of the fall promotional program, the U. S. Bureau of Commercial Fisheries provided various information media materials emphasizing ease of preparation, versatility, and nutritional value of fishery products.

The Bureau's director said, "Continuing research to improve methods of refrigeration and transportation is making high quality fish and seafood products available to more people than ever before. Americans are extremely interested in the nutritional values of food today and it has long been known that fishery products are excellent sources of protein, minerals, and essential B-complex vitamins."

The Department of Agriculture listed "Fish 'n' Seafood Parade" as a merchandising opportunity on a national basis in its October plentiful food literature.

This was the 12th successive year of the national fall promotion program.

Michigan

CHANGES IN GREAT LAKES COMMERCIAL FISHING REGULATIONS APPROVED:

Several changes proposed earlier in Michigan's Great Lakes commercial fishing regulations were approved in August 1965 by that State's Conservation Commission. One of the changes closed commercial fishing for lake trout in Lake Michigan as of October 1, 1965. The closure was timed to protect 1.2 million yearling lake trout planted in Lake Michigan in June 1965.

The same restriction has been in effect for several years in Lake Superior where the lake trout restoration program has made its greatest gains since the start of lamprey control and fish plantings in the late 1950's.

Another action taken by the Commission at its meeting in August is a November 1-30 closed season on whitefish in Lakes Michigan, Huron, and Superior to protect the fish from commercial fishermen during their peak spawning period in those waters. Closed seasons for taking whitefish by commercial netting have previously run from October 1 through December 10 in Lakes Michigan and Huron, and from November 1-26 in Lake Superior.

Another measure approved by the Commission will lift the depth restriction on using trap and pound nets to take lake trout and whitefish in those three lakes. Commercial fishermen operating in those waters have for years not been allowed to set impounding nets in waters deeper than 80 feet for catching either kind of fish.

The final change adopted by the Commission will remove the minimum size limit on yellow perch in Lake Erie.

All of these commercial fishing changes became effective on October 1, 1965. (New Bulletin, Michigan Department of Conservation, August 19, 1965.)

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

National Fish and Wildlife Library

NEW REFERENCE SERVICE TO AID RESEARCH:

The establishment of a national fish and wildlife library reference service was announced September 16, 1965, by the Assistant Secretary of the Interior for Fish and Wildlife and Parks. The new reference facility, developed in cooperation with the International Association of Game, Fish and Conservation Commissioners, will serve State fish and game departments through the Interior Department Library in Washington, D. C., and the Denver Public Library in Colorado.

The reference program is designed to help fish and wildlife research workers on State conservation agency projects partially financed under the Federal Aid in Fish and Wildlife Restoration Acts. Each State, as well as Guam, Puerto Rico, and the Virgi

Islands, participates in the Federal Aid programs administered by the Interior Department's Bureau of Sport Fisheries and Wildlife. Financing of the library reference service will come from the Federal Aid funds prior to their apportionment to the States.

The Director of Interior's Bureau of Sport Fisheries and Wildlife said reference materials will be so organized that a single request will automatically receive attention from both the Denver Public Library, where all unpublished reports are to be housed, and the Library of the Department of the Interior, where publications will be kept. He said, "Establishment of the national fish and wildlife library reference service will provide, for the first time, a convenient means for research biologists to obtain specialized reference materials. Use of research findings of the past will improve coordination and avoid possible duplication of effort. I urge all State and Federal fish and wildlife workers to take full advantage of this new research facility."

New Jersey

ARTIFICIAL "SEAWEED" USED IN COASTAL EROSION-PREVENTION TESTS:

In the summer of 1965, New Jersey announced plans to test plastic ("polypropylene") strings as artificial "seaweed" in an effort to prevent coastal erosion. The tests were to begin in early August 1965 off Lookout Tower at Island Beach State Park in New Jersey. It was hoped that the artificial seaweed would help hold sandy ocean bottoms together and control currents and waves, thereby protecting the shoreline. New Jersey has no natural seaweed beds.

An oil firm supplied materials for the test to the New Jersey State Department of Conservation and Economic Development. That agency built a grid, 90 by 900 feet, containing clusters of the artificial material spaced 3 feet apart. Two types of polypropylene seaweed were to be tested. Half of the grid contained fronds of slit polypropylene film, the other half contained polypropylene monofilament.

The grid was to be planted with a specially designed anchoring formation 800 feet offshore, parallel to the coastline, in 15 feet of water. About 12 tons of lead weights will keep it from floating away.

A 2-year study of the artificial seaweed grid is planned by New Jersey. A log of weather in the area will be kept and periodic soundings and bottom samples will be taken.

The first artificial seaweed test took place on a limited scale 2 years ago in Denmark, when fronds of polypropylene film were planted in a 40-square-meter grid in the Thyboren Channel. During that test it was found that sand accumulated on the channel floor behind and in the grid, within an area of approximately 500 feet from the planting.

More extensive tests have since been initiated in Denmark and England. (Oil, Paint, and Drug Reporter, August 2, 1965.)

The British experiment with artificial ("polypropylene") seaweed is being conducted at Bournemouth, England, and is expected to continue into 1966. As in the Danish and New Jersey tests, the object of the British experiment is to prevent erosion by trapping and building up sand offshore, according to News Scientist, July 29, 1965. That periodical said two theories have been advanced to explain the trapping action. One is that the seaweed reduces shear stress on the submerged shore by concentrating it within itself; the other is that it slightly reduces the orbital velocity of sand particles as they describe ellipses due to the motion of the waves. If the first theory is correct, seaweed should be equally effective both in regions of steady current and in those having alternating wave motion; if the second is correct, it should have no effect in steady currents. It is hoped that the British tests will indicate which mechanism predominates.

Note: See Commercial Fisheries Review, Oct. 1964 p. 56.

North Atlantic Fisheries Explorations and Gear Development

TUNA AND SWORDFISH DISTRIBUTION STUDIES IN NORTHWEST ATLANTIC CONTINUED:

M/V "Delaware" Cruise 65-7 (July 23-August 5, 1965): Survey of the seasonal distribution and abundance of tuna and swordfish in the Northwest Atlantic, using longline sampling gear, was continued during this two-week cruise by the U. S. Bureau of Com-

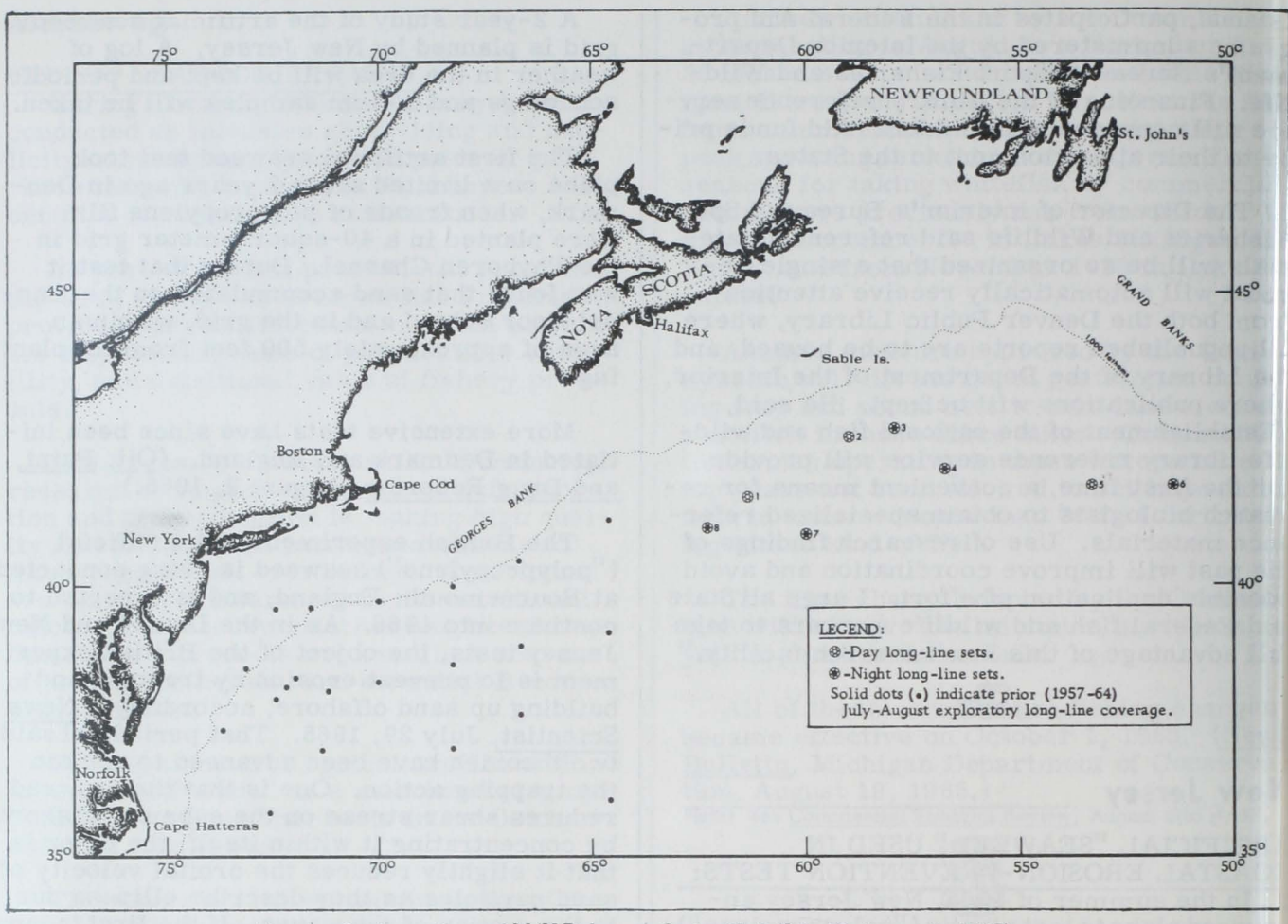


Fig. 1 - Station pattern of M/V Delaware Cruise 65-7 (July 23-August 5, 1965).

mercial Fisheries exploratory fishing vessel Delaware. It was the 15th exploratory long-line cruise for the vessel since spring 1957 to investigate latent pelagic fish resources in oceanic areas. Previous exploratory coverage during July-August in oceanic (over 100 fathoms depth) waters north of 35 degrees North Latitude has totaled 21 long-line sets made in the western portion, west of 64 degrees West Longitude.

LONG-LINE SETS AND CATCH: Three sets of long-line gear were made during daylight hours, and 5 sets were made at night, with a total of 4,600 hooks fished. Hooks baited with squid and herring were spaced at 20-fathom intervals and fished at estimated depths varying from 15 to 35 fathoms. A 600-hook set covered a horizontal distance of approximately 13 nautical miles.

Tuna and swordfish catches in the area surveyed were minimal. Albacore (Thunnus alalunga) were taken at four stations with a maximum catch rate of 0.5 fish per 100 hoo at one of the stations. Average round weigh of albacore tuna caught was 41 pounds and the range was 33 to 56 pounds. Four of the stations covered yielded big-eyed tuna (Thu nus obesus) with a maximum catch rate of 0.3 fish per 100 hooks at two stations. Ave age round weight of big-eyed tuna was 93 pounds and the range was $16\frac{3}{4}$ to 170 pounds The $16\frac{3}{4}$-pound specimen is believed to be one of the smallest of that species taken in the western North Atlantic. A single yellow fin tuna (Thunnus albacares) weighing $14\frac{1}{4}$ pounds was taken at one of the stations.

Swordfish (Xiphias gladius) were caught at three night stations, with a maximum catch rate of 0.3 fish per 100 hooks at one of the three stations. Average round weight was 111 pounds and the range was 60 to 160 pounds. The 2 smaller fish were male (60 and 88 pounds) and the larger 2 were female (134 and 160 pounds).

Fig. 2 - Long-line gear on M/V Delaware is set at night from the port-quarter deck. Baited branchlines (5-fathoms) are clipped on the mainline at 20-fathom intervals. Note hinged cover of tub which opens as a bait tray. Hooks and baits (squid and herring) are separated by metal dividers to prevent snarls.

Other long-line catches of particular note were: 4 white marlin (Tetrapturus albidus), 1 pelagic stingray (Dasyatis violacca), and 1 gempylid (Lepidocybium flavo-brunneum).

THERMAL ENVIRONMENT: While survey of the geographical area was the primary mission of the cruise, attention also was given in selection of working locations within thermal environments most conducive to pelagic fish occurrence. This was accomplished through application of synoptic sea surface temperature information, received by radiofacsimile equipment aboard the vessel, and augmented by vertical (subsurface) water temperature profile data obtained from bathythermograph (BT) casts on location. Fishing results, therefore, suggest that within the geographic area worked, under observed thermal environment conditions, three species of tuna, and swordfish, were available in very small numbers to the gear fished.

LONG-LINE GEAR OPERATIONS: Changes and improvements in handling of long-line gear and deployment of deck personnel permitted a reduction of manpower requirements with no loss in operating time or efficiency. Four men on deck set and hauled long-line gear at the same rate previously requiring 6 men.

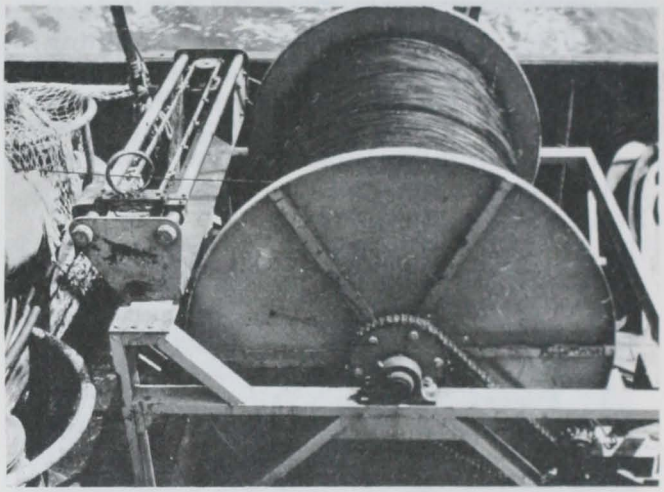


Fig. 3 - A hydraulic long-line reel used during M/V Delaware cruise carried 20 miles of $\frac{1}{4}$-inch mainline spooled by an automatic levelwind.

Earlier improvements have been reported from two previous cruises by the vessel Delaware. Among the modifications during this cruise were: (1) shift of the setout operation aft to the port-quarter rail, (2) reduction in number of 5-fathom coiled branchlines in tubs from 50 to 30, (3) separation of baited hooks, and (4) triple fairleading of the mainline from the hydraulic reel overboard to control line vibration. Further changes to the gear are anticipated during subsequent cruises. Replacement of hand-operated clips with a mechanical device to attach and detach branchlines to the mainline is expected to further reduce setting and hauling rates.

OTHER ACCOMPLISHMENTS AND OBSERVATIONS: In cooperation with the tuna-tagging program at Woods Hole Oceanographic Institution and the shark-tagging program of the Shark Research Panel, American Institute of Biological Sciences, a single big-eyed tuna and 24 sharks of assorted species were marked and released. Flesh samples and livers from two big-eyed tuna, 3 albacore tuna, and 2 white marlin were frozen for investigations at Scripps Institution of Oceanography on concentrations of fallout radionuclides in the marine environment. BT mes-

sages were transmitted to the Naval Oceanographic Office when the vessel was within contact range of Coast Guard radio stations.
Note: See Commercial Fisheries Review, July 1965 p. 32.

* * * * *

TRAWL GEAR EVALUATION STUDIES CONTINUED:

M/V "Delaware" Cruise 65-8 (August 11-20, 1965): Comparative studies of fishing trawls initiated during a June 1965 cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware were continued on this cruise. The two nets used in the studies were a No. 41 trawl and an Atlantic Western trawl.

Fig. 1 - Portion of deck of exploratory fishing Delaware.

The No. 41 trawl used was of No. 54 braided nylon. Roller gear was comprised of a 15-foot center section of 18-inch rubber rollers. Each wing had 15 feet of 16-inch wooden rollers and rounded sweep ropes. The trawl was rigged with 5-fathom legs and a 10-fathom ground cable. A set of rectangular wooden trawl doors, measuring 10 feet 6 inches by 4 feet 6 inches and weighing 1,480 pounds each (dry), were used with this net.

The Atlantic Western trawl was construct ed from No. 150 polyethylene twine and rigg with 20-inch rollers as on Cruise 65-5. The 10-fathom ground cables used during the fir experiment were eliminated early in this cruise to help prevent tear-ups. The trawl doors used were oval type weighing 2,200 pounds each and measuring 10 feet 4 inches by 5 feet 10 inches.

A towing schedule was set up to equate t number of tows with each net during period of daylight and darkness. All tows were fo 1 hour with the exception of a few $1\frac{1}{2}$ hour tows made concurrently with commercial fishing vessels in the immediate vicinity.

Five areas on Georges Bank were fished they were two areas along the Northern Edg the easterly end of the Northern Edge, the eas erly side of the Leg, and the Northeast Peak.

Fishing on this cruise was extremely poo in all areas. Average catches for both nets fo the trip were only a little over 200 pounds pe 1-hour tow, and the best catch was 1,800 pound

Only one tear-up, resulting in damage to the wings of the Atlantic Western trawl, wa encountered in over 50 tows. The sections for that net were cut and finished after the tear-up and repairs were made. Pre-cut sections would have allowed the repairs to b made with no difficulty in a short time.

Fig. 2 - Fish in trawl net of the M/V Delaware.

Difficulty was experienced with the oval doors during the trip. The forward door h a tendency to lay over on its back and som scuffing of the wood resulted. It was found

that if the wires were held tightly enough when setting out, the problem could be minimized.

As neither net seemed to be fishing properly, the catch results of this cruise cannot be considered a valid assessment of the relative catching ability of the two trawls. In view of the problems encountered, further work will be necessary to obtain an accurate evaluation of the trawls. Additional cruise time was to be scheduled to effect proper gear performance and to continue comparative fishing trials.

Note: See Commercial Fisheries Review, September 1965 p. 36.

North Atlantic Fisheries Investigations

LOBSTER AND SEA HERRING POPULATIONS AND LARVAE STUDIED:

M/V "Delaware" Cruise 65-9--Herring Investigations (August 26-30); Lobster Investigations (August 31-September 4, 1965): Herring and lobster investigations were conducted during this cruise in the North Atlantic Ocean (northern part of Georges Bank, Little Georges, and Corsair and Veatch's Canyons) by the U. S. Bureau of Commercial Fisheries research vessel Delaware. 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: Four herring trawl sets were made at the stations worked. The sets (1 hour each) made in waters of 30 to 45 fathoms yielded a total of 34 bushels (2,400 pounds). The herring caught were from 25.9 to 34.9 centimeters (about 10 to 13.7 inches) long. The 1960 year-class was dominant in the catches, followed in percentage occurrence by the 1961 and 1962 year-classes. Examination of gonadal development was made and a total of 30 blood samples was obtained and stored for analysis. Species of fish caught, other than herring were whiting (4 bushels), butterfish ($\frac{1}{2}$ bushel), yellowtail ($\frac{1}{2}$ bushel), and haddock (185 bushels). At one station, 160 bushels of haddock (over 11,000 pounds) were caught.

Lobster: A total of 17 trawl sets was made at the 3 lobster stations covered. The sets made in waters ranging in depth from 15 to 220 fathoms yielded 43 lobsters (28 females, 9 of which were berried, and 15 males). Most of the lobsters were caught at Little Georges at depths of 25 fathoms or less. Two lobsters were soft-shelled and the average weight of all lobsters caught was about $4\frac{1}{2}$ pounds. They ranged in weight from $\frac{1}{3}$ to 12 pounds. Eleven blood samples were obtained for analysis.

PLANKTON OPERATIONS: Herring: Seven 1-meter net plankton tows lasting 15 minutes each (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface) were made during the cruise. No herring larvae were obtained in those tows.

Lobster: Four 1-meter net plankton tows of 15 minutes each (at the surface) were made during the cruise, all without lobster larvae.

HYDROGRAPHIC OBSERVATIONS: Five sea-bed drifters and 5 drift bottles were released at hydrographic stations, and at each station bathythermograph (BT) casts were made, surface salinities collected, and weather observations recorded.

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

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DISTRIBUTION OF ZOOPLANKTON AND LARVAL LOBSTERS IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 5-65 (August 14-28, 1965): To determine gross distribution of zooplankton and larval lobsters and to take environmental measurements at selected continuity stations in the coastal areas of the Gulf of Maine were the objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Rorqual.

Oblique tows from 0-20 meters (65.6 feet) with the Gulf of Mexico No. III trawl and surface tows with the Boothbay No. 1 trawl equipped with a special lobster net were made at each station worked.

Preliminary findings during the cruise indicated that volumes of zooplankton decreased from west to east along the Gulf of Maine coast. In the Gulf's western area, copepods dominated the zooplankton. Crustacean eggs and fish eggs dominated the catches made in the central and eastern areas. A total of 47 lobster larvae was collected, 41 of which were in the fourth developmental stage and 6 in the first stage. The heaviest concentration was found in the offing of Penobscot Bay

where 24 fourth stage larvae were captured. Heavy concentrations of "brit" size herring were observed in the Frenchman's Bay area; no other concentrations of herring were located.

A 5-bottle (Nansen) cast, a bathythermograph (BT) cast, and a Secchi disc reading was made at each station. Five drift bottles and 5 sea-bed drifters were released at each station.

North Atlantic

FOREIGN FISHING ACTIVITY OFF COAST, SEPTEMBER 1965:

There was a slight increase in Soviet fishing activity in the North Atlantic from August to September 1965. A total of 112 vessels were sighted during September. They were identified as 51 fish factory stern trawlers, 43 side trawlers, 16 processing and refrigerated fish transports, 1 fuel and water tanker, and 1 tug. This compared with an estimated 75 vessels sighted during August 1965, and 176 vessels in September 1964.

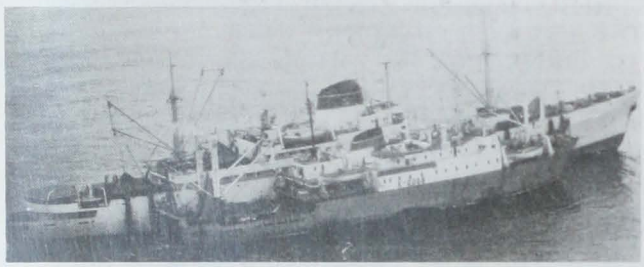


Fig. 1 - Soviet factory stern trawler (Tropik class) alongside fish transport vessel in Northwest Atlantic.

The observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., which conducts weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Soviet fishing operations during the month generally ranged from the Cultivator and Georges Shoals area to the "Southeast Part" of Georges Bank, 70 to 150 miles east of Cape Cod. All vessels were actively engaged in fishing operations. Moderate to heavy catches of fish observed on decks and in their trawls appeared to be primarily whiting with a small mixture of herring. In

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

many instances crews on board the large side trawlers were cutting and dressing out fish. From their size, shape, and color, those fish were believed to include substantial amounts of small haddock and mixed groundfish. The fish were bagged in sections of netting and transferred to nearby processing vessels. Similar catches were also observed on board the Soviet factory stern trawlers.

It appeared that the Soviet fishing vessels have not placed any great emphasis on fishing for herring in 1965. Up until this year, herring has been the vessels' mainstay in total catch since they first arrived in the North Atlantic area in 1961.

During September there was a substantial decrease in Soviet vessels in waters adjacent to Nova Scotia, principally of the SRT and SRT-R class. That can be attributed to those vessels fishing constantly since early spring 1965 and their probable need for major repairs. Another reason may be because of the severe weather conditions that prevail in late fall.

In addition to Soviet fishing activity, 5 Polish stern trawlers and 1 side trawler, and 2 Rumanian stern trawlers were observed fishing on the Cultivator Shoals area during September. Those vessels were actively fishing and believed to be taking large quantities of small haddock.

Note: See Commercial Fisheries Review, October 1965 p. 41.

Oregon

YOUNG CHINOOK SALMON RELEASED IN EXPECTATION OF WILLAMETTE RIVER POLLUTION IMPROVEMENT:

In early September 1965, the U. S. Fish and Wildlife Service announced plans for the immediate release of one million spring chinook salmon fingerlings in the upper Clackamas

River drainage system in the expectation that pollution in the Willamette River would subside to a safe level by October 1965 when the fish began moving downstream through Portland's critical contamination zone.

The one million young fish originally had been scheduled for release in late August 1965 from Eagle Creek National Fish Hatchery near Estacada, Oregon. But the August release was postponed because of the serious pollution problem which existed at that time in the lower Willamette River. It was feared that the young salmon would die in the oxygen-deficient water as they attempted to swim through Portland's harbor en route to the ocean. By September, however, there had been some improvement in the pollution situation and fishery scientists expected cooler weather and autumn rains to relieve the oxygen problem, thus assuring safe passage for the salmon.

Pesticides

DANGER OF CHEMICAL PESTICIDES TO MARINE LIFE UNDER STUDY:

Amazingly small amounts of pesticides can kill shrimp, crab, and other aquatic life. One part of DDT in one billion parts of water (1 p.p.b.) was found to kill blue crab in 8 days. (One part per billion is the relationship 1 ounce of chocolate syrup would bear to 10 million gallons of milk.)

Those and other new findings on the dangers of certain chemicals to wildlife are given in the 1964 annual report on pesticide research by the U. S. Fish and Wildlife Service. The purposes of the continuing study are to (1) determine the kinds and amounts of pesticides that are injurious to fish and wildlife and (2) assist in discovering ways to achieve pest control with the least hazard to fish and wildlife resources.

The researchers found that commercial brown and pink shrimp exposed to less than half of one part of heptachlor, endrin, or lindane in one billion parts of water were killed or immobilized in 48-hour laboratory tests. Those chemicals, like DDT, are chlorinated hydrocarbon insecticides. In the laboratory, paralyzed fish or shellfish may live for days, even weeks. But in the sea, where only the fittest survive, death may result almost immediately.

Under experimental conditions, the oyster detects and stores pesticides present in the water at concentrations as low as 10 parts per trillion. Pesticides stunt the growth of oyster shells. To test oyster growth, researchers filed off the thin new growth on the edge of the shells, put some oysters in water containing a pesticide, others in clean water. The results became obvious in a few days: the shells of those in clean water grew back; the others showed no perceptible growth.

The researchers found that most of the chlorinated hydrocarbons, at a concentration of 1 part per million for 4 hours, decreased plankton productivity 50 to 90 percent. Another group of pesticides, the organic phosphorous compounds, proved much less toxic.

All life forms in the sea depend on plankton which consists of microscopic plants and animals grouped by billions. Scientists fear that great kills of plankton could be caused by pesticides and not be noticed. Their absence, however, could mean the loss of an entire crop of fish dependent on them for food.

An important part of the research program seeks to learn the significance of pesticide residues. Fish and wildlife have been caught alive, and apparently healthy, which contained levels well above those considered lethal in laboratory tests. Those specimens had not taken in at any one time doses large enough to kill them. Over a long period of time, however, they had accumulated and stored the pesticides in their fat. For these specimens, a period of stress during which they would have to use their reserve of fat might prove fatal.

The research program of the U. S. Fish and Wildlife Service also seeks to compare the relative toxicity of many pesticides to fish and wildlife so that the least toxic ones can be used against pests.

Safety at Sea

EXPLOSIVE HAZARDS AT SEA:

The U. S. Coast Guard warns fishermen that both explosive and nonexplosive mines, torpedoes, and other ordnance may be present in coastal waters subject to bottom fishing operations.

New England vessels fishing off the Virginia Capes have reported picking up nonexplosive and explosive objects at the following locations: 1H4-1890, 1H4-2300, 1H4-2152, 1H4-2218, 1H5-2935, 1H5-2960, 1H5-2980, 1H5-2978.

The Coast Guard advises that nonexplosive ordnance such as practice torpedoes will normally be painted bright yellow or orange. Any such item which cannot be readily identified by sight as nonexplosive must be treated as an explosive item. If in doubt about the identity of an object, treat it as an explosive. Do not attempt to bring the object on board or alongside. If possible release the object immediately and radio the nearest Coast Guard or Navy station giving an accurate position of your vessel.

If the object cannot be released or freed by cutting fishing lines or nets, the following actions are advised: (1) Stream object as far aft as possible. (2) Notify shore station and stand by for instructions and assistance. (3) Keep crew at forward end of vessel with deck house between them and object astern. (4) Maintain steerageway as necessary to stay in area until assistance arrives.

South Atlantic Fisheries Explorations and Gear Development

CALICO SCALLOP AND SHRIMP EXPLORATIONS OFF FLORIDA EAST COAST:

M/V "Oregon" Cruise 103 (August 16-27, 1965): A 12-day shrimp and scallop exploratory cruise off Florida's east coast was completed August 27, 1965, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon (see map page 35).

Seasonal assessment was made of the Cape Kennedy calico scallop (Pecten gibbus) bed and shrimp trawling was conducted at night to extend exploratory fishing coverage in the 30- to 40-fathom depth range off the Florida east coast. Brown and pink shrimp (Penaeus aztecus and P. duorarum) were located in that area by the Oregon during January 1965 cruise.

CALICO SCALLOPS: A total of 54 drags lasting 30- to 45 minutes each was made with a 6-foot tumbler dredge in depths ranging from 14 to 37 fathoms. Calico scallop catches varied from 0 to 595 pounds per drag. Catches of commercial size scallops measuring 50-60 millimeters (2.0-2.4 inches) of over 100 pounds per drag were made in the 27- to 33-fathom depth range. The most productive depths were 28 to 31 fathoms. The scallops were in prime condition and yielded 57 to 72 (average 63) meats to the pound.

About 300 pounds of small calico scallops measuring 25-35 millimeters (1.0-1.4 inches) were taken with a 40-foot flat trawl in 22 fathoms. That gear also caught commercial-size scallops (2.0-2.2 inches) up to 115 pounds per hour drag in 36 fathoms yielding 110 meats to the pound.

SHRIMP: A total of 55 drags lasting from 30 to 90 minutes each was made with 40-foot flat trawls fished on 6- and 7-foot chain doors in depths ranging from 6 to 54 fathoms. Irregular bottom was encountered from 39 to 52 fathoms. Small amounts of pink shrimp were found in 9 to 11 fathoms where catches ranged from 0 to 20 pounds of 21-25 and 26-30 (heads-on) count shrimp per drag. Incidental fish catches consisted mostly of spot (Leiostomus xanthurus), croaker (Micropogon undulatus), pinfish (Lagodon rhomboides), and filefish (Stephanolepis hispidus).

Trolling lines, maintained while steaming during daylight hours, caught 3 amberjack (Seriola dumerili), 4 little tuna (Euthynnus alletteratus), 2 dolphin (Coryphaena hippurus), 1 king mackerel (Scomberomorus cavalla), and 1 barracuda (Sphyraena barracuda).

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

Tennessee Valley Authority

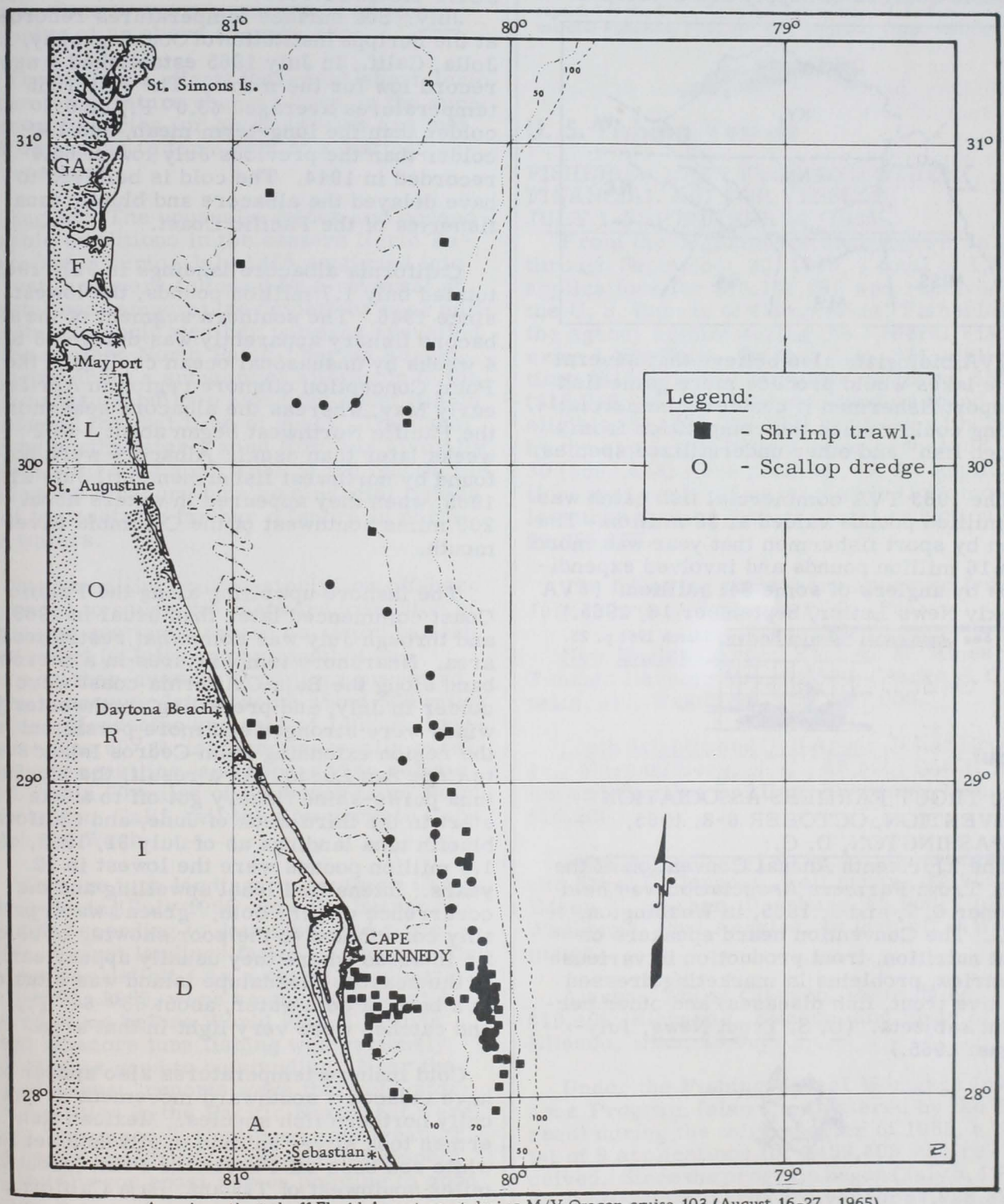
TRAWLER PURCHASED FOR COMMERCIAL "ROUGH FISH" EXPLORATIONS:

A 35-foot fishing trawler has been purchased by the Tennessee Valley Authority (TVA) for research on commercial fishing--principally for explorations in the TVA water complex and impoundments to produce "rough fish" in commercial quantities.

The vessel will be used in testing methods that could assure a large and sustained supply of "rough fish" for industrial fish markets. An assessment made several years

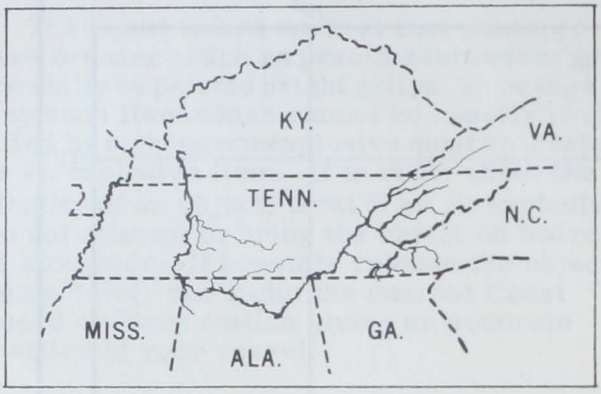
ago of TVA reservoirs has shown a total "rough fish" population of about 61,000 tons, much of which is not being harvested. The annual "rough fish" production has been about 3,000 tons, with the belief that it could be safely increased to 30,000 tons a year.

It is estimated there is a $9 million annual potential for commercial fishing in TVA



Area investigated off Florida's east coast during M/V Oregon cruise 103 (August 16-27, 1965).

waters if industrial fish markets can be established. Such markets include livestock and pet feed manufacturers and fertilizer producers as outlets for industrial fish if large enough quantities are available and dependable sources of supply are developed.



TVA biologists also believe that several of the lakes would produce more game fish for sport fishermen if heavier commercial fishing could reduce the competition from "rough fish" and other underutilized species.

The 1963 TVA commercial fish catch was 5.6 million pounds valued at $2 million. The catch by sport fishermen that year was more than 16 million pounds and involved expenditures by anglers of some $41 million. (TVA Weekly News Letter, September 16, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 28.

Trout

U. S. TROUT FARMERS ASSOCIATION CONVENTION, OCTOBER 6-8, 1965, IN WASHINGTON, D. C.:

The Thirteenth Annual Convention of the U. S. Trout Farmers Association was held October 6, 7, and 8, 1965, in Washington, D. C. The Convention heard speakers on trout nutrition, trout production in various countries, problems in marketing dressed and live trout, fish diseases, and other pertinent subjects. (U. S. Trout News, July-August 1965.)

Tuna

PACIFIC ALBACORE TUNA FISHERY AFFECTED BY ERRATIC WATER TEMPERATURE CHANGES, JULY-AUGUST 1965:

July: Sea surface temperatures recorded at the Scripps Institution of Oceanography, La Jolla, Calif., in July 1965 established a new record low for the month. The July 1965 temperatures averaged 63.0° F., or 5.1° colder than the long-term mean, and 1.4° colder than the previous July low of 64.4° F., recorded in 1944. The cold is believed to have delayed the albacore and bluefin tuna fisheries of the Pacific Coast.

California albacore landings in July 1965 totaled only 1.7 million pounds, the lowest since 1946. The southern segment of the albacore fishery apparently was delayed 3 to 4 weeks by unseasonal ocean cooling in the Point Conception offshore region in April and early May, whereas the albacore season in the Pacific Northwest began about 1 to 2 weeks later than usual. Albacore were not found by northwest fishermen until July 21, 1965, when they appeared in waters about 200 miles southwest of the Columbia River mouth.

The inshore upwelling along the Pacific Coast commenced later than usual in 1965, and through July was somewhat restricted in area. Nearshore temperatures in a narrow band along the Baja California coast were colder in July, and prevailing northwesterly winds were stronger and more persistent in the region extending from Cedros Island south to Cape San Lucas. As a result, the bluefin tuna purse-seine fishery got off to a late start in the third week of June, and California bluefin tuna landings as of July 31, 1965, of 1.5 million pounds were the lowest in 12 years. Intensified local upwelling and the occurrence of very cold, "green" water probably contributed to the poor showing of bluefin in areas where they usually appear early in the season. Guadalupe Island was situated in a band of cold water, about 63°-64° F., and catches were very light in that area.

Cold inshore temperatures also appear to have induced a southward movement of typically northern fish species. Mexican fishermen took silver salmon in gill nets set for white sea bass off Pescadero Point (about 20 miles southwest of Tijuana, Baja California) in 16-18 fathoms of water on August 2, 1965.

The nets were set 2 to 3 fathoms off the bottom. Substantial catches of pink salmon were reported at Eureka, Calif., during the last week of July.

Later in the summer of 1965, Pacific coastal sea surface temperatures appeared to be warming at an above average rate.

The profound effects that rapid, short-term ocean temperature changes have on the success of fisheries for given species are just now beginning to form part of a distinguishable pattern.

August: The unusual weather and oceanographic conditions in the eastern North Pacific Ocean during July 1965 continued into August, and were followed by a reversal of coastal sea temperature deviations near midmonth. Cyclonic weather patterns prevailed in the eastern North Pacific during August, bringing about a substantial alteration in the high pressure buildup along the coast (which is normal for that time of year). The usual strong northwesterly wind flow was virtually absent until the fourth week of the month, allowing the albacore tuna commercial fishing fleet to penetrate farther offshore in northern waters.

The prevailing southwesterly flow offshore appeared to cause the eastward extension of the warm sea temperature deviation pattern first noted in July, and by month's end, warmer-than-average conditions prevailed from Vancouver Island south about 600 miles to Cape Mendocino and east of 130° W. longitude. The 60° F. isotherm generally paralleled the coastline, and appeared to remain well within 60 miles of the beach from Point Conception, Calif., all the way north to Cape Flattery, Wash.

Albacore tuna landings in southern California during July 1965 were the lowest on record, according to data tabulated since 1945. August landings failed to make up for the earlier deficit. As a result, landings to August 31, 1965, were among the lowest reported since before World War II. North coast albacore tuna fishing was variously reported as good to outstanding. Near the end of August, reports were that cold-storage facilities in the Pacific Northwest were being "swamped." Continued good weather and heavy production appeared in prospect for the Oregon coast region pointing to good September catches of albacore tuna in that area.

Note: Ocean studies are being given renewed emphasis by the Tuna Forecasting staff of the U. S. Bureau of Commercial Fisheries. They ask that all unusual and noteworthy occurrences of fish species found outside a usual range, as well as corresponding observations of unusual sea conditions associated with them, be reported to the Tuna Resources Laboratory, U.S. Bureau of Commercial Fisheries, P.O. Box 271, La Jolla, Calif. 92038.

U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JULY 1-SEPTEMBER 30, 1965:

From the beginning of the program in 1956 through September 30, 1965, a total of 1,672 applications for $43,143,095 was received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 874 applications ($19,281,779) had been approved, 555 ($13,049,319) had been declined or found ineligible, 213 ($8,089,892) had been withdrawn by the applicants before being processed, and 30 ($693,968) were pending. Of the applications approved, 325 were approved for amounts less than applied for--the total reduction was $2,028,137.

The following loans were approved from July 1 through September 30, 1965:

New England Area: Kenneth M. Ames, Tenants Harbor, Me., $1,500; Clarke C. Chappelle, Jr., Wakefield, R. I., $7,000.

South Atlantic and Gulf Area: Julian Brown, Jr., Marshallberg, N. C., $8,500; Dan H. Allen and Carolyn S. Allen, Freeport, Tex., $15,200.

Pacific Northwest Area: E. H. Jenness and Ethel B. Jenness, Bellingham, $4,500; Edson W. Stephan, Roseburg, $5,000; Glen Washburn, Port Angeles, $8,000; all in Washington.

Alaska: Philip Clausen, Petersburg, $19,408; Richard I. Eliason, and Betty M. Eliason, Sitka, $6,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the third quarter of 1965, a total of 9 applications for $459,403 was received. Since the program began (July 5, 1960), 86 applications were received for $7,928,395.

Of the total, 71 applications were approved for $5,200,135 and 7 applications for $1,081,715 were pending as of September 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 58 ($3,266,049), approved 51 ($2,312,137).

Pacific Northwest Area: Received 8 ($1,861,250), approved 5 ($526,296).

Alaska: Received 5 ($75,596), approved 4 (64,774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through September 30, 1965, a total of 47 applications for $10,398,500 had been received. Public hearings on 24 applications were completed during that period and invitations to bid for 6 vessels were sent out.

Note: See Commercial Fisheries Review, August 1965 p. 57; November 1964. p. 61.

U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 4, 1965, amounted to 31,396,725 pounds (about 1,495,082 standard cases), according to preliminary data compiled by the U.S. Bureau of Customs. That was an increase of 19.4 percent from the 26,920,792 pounds (about 1,251,942 standard cases) imported during January 1-August 29, 1964.

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

Wholesale Prices

EDIBLE FISH AND SHELLFISH, SEPTEMBER 1965:

The rising price trend for fishery products continued in September 1965. For July-September 1965, prices with few exceptions were mostly higher for a number of the major fresh and frozen fish and shellfish products, and for canned pink salmon. At 116.2 percent of the 1957-59 average, the wholesale index for edible fishery products (fresh, frozen, and canned) rose 1.7 percent from August to September 1965. Compared with September 1964, that index this September was up 5.9 percent because of substantially higher prices for large haddock, Great Lakes fresh-water fish, frozen fillets, and several canned fish products.

The subgroup index for drawn, dressed, or whole finfish was up 1.8 percent from August to September. At New York City from August to September prices rose sharply for Great Lakes round yellow pike (up 35.7 percent) because of the Jewish Holiday demand and rose slightly for western fresh salmon (up 2.7 percent). Those higher prices were partly offset by lower prices at Boston for ex-vessel large haddock (down 3.8 percent) and at Chicago for Lake Superior fresh whitefish (down 9.5 percent). As compared with September 1964, the subgroup index this September was up 5.2 percent because prices this September were up 72.6 percent for yellow pike, 28.1 percent for haddock, and 21.0 percent for whitefish. The exceptions were halibut and salmon which were down from the high September 1964 prices.

Although September 1965 prices for fresh haddock fillets at Boston rose 17.1 percent from the previous month, they were in large part cancelled out by a 7.0-percent drop in prices at New York City for South Atlantic fresh shrimp. This brought the fresh processed fish and shellfish subgroup index down by 1.4 percent. Prices for standard shucked

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Sept. 1965	Aug. 1965	Sept. 1965	Aug. 1965	July 1965	Sept. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					116.2	114.3	109.8	109.7
Fresh & Frozen Fishery Products:					117.9	117.4	112.8	113.7
Drawn, Dressed, or Whole Finfish:					135.8	133.4	119.0	129.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.18	.19	142.1	147.7	91.4	110.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.51	.51	150.8	149.4	147.9	162.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.94	.91	131.0	127.5	125.8	136.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.58	.64	85.8	94.8	87.3	70.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.95	.70	155.5	114.6	102.3	90.1
Processed, Fresh (Fish & Shellfish):					107.3	108.8	108.6	107.4
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.48	.41	116.6	99.6	97.2	106.9
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.80	.86	93.7	100.8	100.8	95.5
Oysters, shucked, standards	Norfolk	gal.	7.25	7.13	122.3	120.2	120.2	122.2
Processed, Frozen (Fish & Shellfish):					105.3	104.8	105.7	100.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	100.1	98.8	97.6	92.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.38	111.4	111.4	108.5	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.31	108.7	108.7	112.2	103.4
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.86	.85	101.4	100.8	103.7	95.5
Canned Fishery Products:					113.7	109.4	104.9	103.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	27.00	24.50	117.7	106.8	95.9	94.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.6
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.25	128.3	131.5	131.5	128.3

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.

Oysters at Norfolk rose 2.0 percent from August to September and were slightly higher than in September 1964. Compared with the same month a year earlier, the subgroup index was down only slightly. Prices for haddock fillets this September were higher by 9.1 percent, but were more than offset by lower prices for fresh shrimp (down 1.9 percent).

Higher prices from August to September for frozen flounder fillets (up 1.3 percent) at Boston and for frozen shrimp (up 0.6 percent) at Chicago were responsible for a 0.5-percent rise in the subgroup index for frozen processed fish and shellfish. Prices for other species of frozen fillets were unchanged from the previous month. As compared with September 1964, prices this September were higher for all items in the subgroup and the index was up 5.3 percent.

The September 1965 subgroup index for canned fishery products rose 3.9 percent from the previous month. Prices for canned pink salmon again moved up, and from August to September were higher by 10.2 percent as a result of the very low 1965 season pack. By the end of the 1965 packing season, the quantity of pink salmon packed was only about 45 percent of the previous season's output. September prices for canned Maine sardines dropped 2.4 percent from the previous month as the new season's pack moved into the market. The new season sardine pack by the end of September was 60 percent greater than the previous season's pack. As compared with September 1964, the subgroup index this September was up 10.3 percent--prices for canned salmon were up 24.2 percent and for California jack mackerel up 14.2 percent. Prices for other canned fish were the same as in September 1964.