



TRENDS AND DEVELOPMENTS

Alaska

NONRESIDENT COMMERCIAL FISHERMEN RESTRICTIONS RULED UNCONSTITUTIONAL:

The Emergency Commercial Fishing Measures Act of the 1961 Alaska Legislature allowed the Board of Fish and Game to close fishing districts to nonresident commercial fishermen if it was determined that there would be a poor salmon run in the district involved. A three-man Federal Court in Juneau on February 14 ruled that the Alaska Act is unconstitutional.

The Act was challenged by 17 individuals and 8 packing companies. These sought an injunction prohibiting the Fish and Game Board from enforcing the provisions of the law. In an opinion cited by Circuit Court Judge Homer T. Bone and District Judges Walter H. Hodge and Charles L. Powell, the injunction was granted. The opinion, in part, stated that "Any discrimination must be reasonable to be sustained. Here nothing appears that will in any way justify the application of the prohibition to nonresidents and not to residents."



California

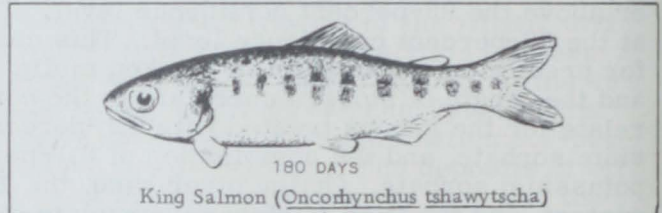
MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62N1a and 62N1b Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued (January 8-11, 15-19, 1962) in the Carquinez Strait area to capture marked salmon fingerlings on their seaward migration. A nylon midwater trawl with 25-foot square opening was used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3 p.m. and each

tow was for 20 minutes. Surface tows were alternated between upstream and downstream and between the north shore, center, and south shore of the channel. Deep tows were confined to the center of the channel.

A total of 95 tows was completed in the Strait during this cruise yielding a catch of 39 king salmon (*Oncorhynchus tshawytscha*) fingerlings, and one king salmon adult; none of which was marked.



Other species appearing in the catch consisted mostly of striped bass (*Roccus saxatilis*)--1,846 fish, northern anchovy (*Engraulis mordax*)--1,105 fish, Sacramento smelt (*Spirinchus thaleichthys*)--899 fish, American shad (*Alosa sapidissima*)--967 fish, Pacific herring (*Clupea pallasii*)--69 fish, tomcod (*Microgadus proximus*)--56 fish, and King salmon (*Oncorhynchus tshawytscha*)--40 fish.

Note: See Commercial Fisheries Review, Feb. 1962 p. 13.

Cans--Shipments for Fishery Products,

January-December 1961

Total shipments of metal cans during January-December 1961 amounted to 126,018 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 123,929 tons in the same period of 1960. Canning of fishery products in 1961 was



confined largely to tuna, jack mackerel, Pacific salmon, and Maine sardines. Although the packs of Maine and California sardines, and shrimp were down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased in January 1962 by the Defense Subsistence Supply Centers than in December 1961. The drop in the quantity purchased was 6.7 percent and the value was down 10.2 percent. As compared with the same month in 1961, purchases in January 1962 were down 5.7 percent in quantity, but up 7.7 percent in value. Higher prices and the purchase of higher-priced products accounted for the increase in value this January.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, January 1962 with Comparisons

QUANTITY		VALUE	
January		January	
1962	1961	1962	1961
... (1,000 Lbs.) (\$1,000) ...	
1,751	1,856	996	925

Prices paid for fresh and frozen fishery products by the Department of Defense in January 1962 averaged 56.9 cents a pound, about 7.1 cents a pound more than the 49.8 cents a pound paid in January 1961. The higher average price for purchases this January are attributed to generally higher prices for most fishery products because of light supplies.

Canned: Canned tuna was the principal canned fishery product purchased for the use

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, January 1962 with Comparisons

Product	QUANTITY		VALUE	
	January		January	
	1962	1961	1962	1961
... (1,000 Lbs.) (\$1,000) ...		
Tuna	3,113	1,002	1,739	442
Salmon	-	-	-	-
Sardine	3	21	2	11

of the Armed Forces in January 1962. The amount was the largest ever purchased of canned tuna during a single month.

Note: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than reported above.

(2) The Military Subsistence Supply Agency, effective January 1, 1962, changed its name to Defense Supply Agency. Also, the field offices were redesignated Defense Subsistence Supply Centers.

(3) See Commercial Fisheries Review, March 1962 p. 14, February 1962 p. 18.



Frozen Foods

NEW INDICATOR RECORDS TIME-TEMPERATURE EXPERIENCE:

A frozen food temperature monitor has been made available by a Los Angeles manufacturer of temperature indicators. It will register environmental temperatures for frozen foods from processor to consumer.

A flexible tab with pressure-sensitized adhesive applicable to most surfaces, the indicator (enveloped in a plastic jacket) has four easily-read windows. The tabs are easily read.

The monitor works on a time-temperature basis, and activates on immersion in tap water for about a minute, at the end of which the activation indicator turns pink. Excess water is removed by shaking, and the tab, for accurate recording, should be placed in cold storage within five minutes.

The tab will stay in place, after its protective backing is removed, until removed.

Time-temperature experience is recorded as on a thermometer. The four windows, initially blue-gray, will turn bright red from the left end at a rate dependent on the temperature, and the red indication, which is irreversible, moves across the tab commensurate with the length of temperature exposure.

Simulating the behavior of frozen food, the red zone will travel the full length of the graduated scale in about one year or more at 0° F., 3 months at 10° F., 2 to 3 weeks at 20° F., and about one day at 30° F. Infinite variations in time-temperature rates are available. (Frosted Food Field, January 1962.)



Gulf Fishery Investigations

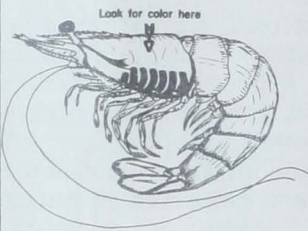
LARGE-SCALE BROWN SHRIMP MARKING EXPERIMENT IN GULF OF MEXICO:

A large-scale brown shrimp marking experiment was started in the northwest Gulf of Mexico in March 1962 by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries. This is part of the Bureau's expanded program of research on the Gulf of Mexico shrimp stocks. Objectives of the experiment will be to secure a reliable index of the rate of fishing, together with information on the movement and growth of shrimp.

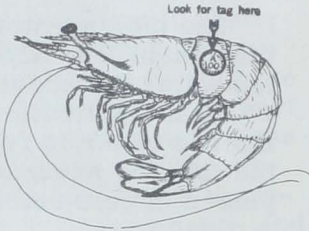
STAINED SHRIMP

\$ 2.00 REWARD

SHRIMP HAVE BEEN MARKED WITH BLUE AND GREEN BIOLOGICAL STAINS OR SMALL GREEN PLASTIC DISKS TO OBTAIN INFORMATION ON MOVEMENTS, GROWTH, AND RATE OF HARVEST. THE DYE ONLY APPEARS ON THE SIDES OF THE HEAD (IN THE GILLS) WHILE THE SMALL PLASTIC DISKS ARE FASTENED IN THE TAIL AS SHOWN IN THE ILLUSTRATION.



Look for color here



Look for tag here

A REWARD OF \$2.00 WILL BE PAID FOR STAINED OR TAGGED SHRIMP WHEN RETURNED WITH THE FOLLOWING INFORMATION:

1. Exact place the shrimp was caught.
2. Date the shrimp was caught.

NOTIFY THE GALVESTON BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FORT CROCKETT, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE AGENT AT ANY PORT OF LANDING.

Poster on the shrimp marking project being displayed at Gulf States fishing ports.

The capture, marking, and release of the experimental shrimp was done aboard the exploratory fishing vessel Silver Bay. About 2,000 shrimp marked with green stain and an additional 2,000 shrimp tagged with small green plastic disks attached to the tail were released. The stain injected into shrimp ultimately concentrates in restricted areas of the head. Commercial shrimp catches should be carefully examined for marked or stained shrimp on the vessels as well as in the

processing plants. A second experiment involving similar numbers of shrimp will be started in July 1962. Therefore, stained or tagged shrimp will be appearing in catches during most of 1962.

Of particular value will be the number of marked shrimp subsequently recaptured, detected, and returned. The nature of the experiment requires that the highest possible number of marked specimens be detected and returned for analysis. Posters describing the project and giving information on how marked shrimp recoveries should be disposed of are prominently displayed at shrimp landing ports.

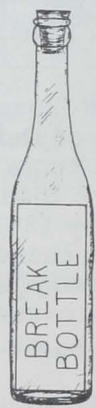
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ROLE THAT NORTHERN GULF OF MEXICO CURRENTS PLAY IN MOVEMENT OF YOUNG SHRIMP BEING STUDIED:

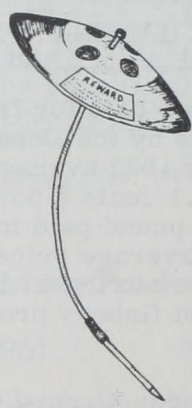
As another part of an expanded shrimp research program, the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in February 1962 started a study of water currents in the northern

REWARD

DRIFT BOTTLES AND SEABED DRIFTERS HAVE BEEN RELEASED AT KNOWN LOCATIONS IN THE GULF OF MEXICO BY SCIENTISTS FROM THE GALVESTON BIOLOGICAL LABORATORY. THESE RELEASES ARE PART OF A STUDY TO DETERMINE THE ROLE THAT WATER CURRENTS PLAY IN THE MOVEMENT OF YOUNG SHRIMP FROM OFFSHORE SPAWNING GROUNDS TO INSHORE NURSERY GROUNDS.



BREAK BOTTLE



REWARD

A REWARD OF 50¢ WILL BE PAID FOR DRIFT BOTTLE ENCLOSURES AND SEABED DRIFTER LABELS WITH FOLLOWING INFORMATION:

1. Exact place the bottle or seabed drifter was found.
2. Date of find.

NOTIFY THE GALVESTON BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FORT CROCKETT, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE AGENT AT ANY PORT OF LANDING.

Replica of poster on drift bottles and seabed drifters being displayed in Gulf States shrimp landing ports.

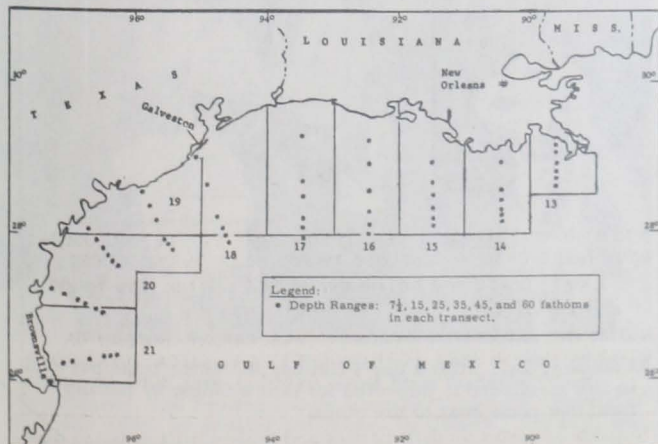
Gulf of Mexico. The objective will be to determine the role that water currents play in the movement of young shrimp from off-shore spawning grounds to inshore nursery grounds.

Each month 12 drift bottles and 6 seabed drifters will be released at each of 60 trawling stations located between the Mississippi Delta and Brownsville, Tex. The first seabed drifters and drift bottles were released in the northwestern Gulf of Mexico February 17-March 1, 1962. The drift bottles could be carried by surface currents to any point on the shore of the Gulf of Mexico. The seabed drifters are designed to measure currents on the bottom and will most often be recovered in shrimp trawls.

The success of the study will depend upon accurate reporting of the location and time the drift bottle or seabed drifter is found. Both of these devices are virtually indestructible and may be returned over a long period of time. Posters describing the project and giving information on how recovered drift bottle cards and seabed drifter labels are to be returned are displayed at shrimp landing ports.

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-17 and "Miss Angela" Cruise MA-11: Bad weather interfered with the shrimp sampling conducted by the M/V Belle of Texas and Miss Angela between February 17-28, 1962. Both of these research vessels are operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico.



Shows the station pattern for cruise BT-17 of the M/V Belle of Texas and cruise MA-11 of the M/V Miss Angela, February 17-28, 1962.

During these cruises good catches of 15-20 count heads-on shrimp were made in the 40-60 fathom range off Terrebonne Bay and in the 20-40 fathom range off Morgan City, La. But the amount caught was not as great as the amount caught in previous cruises in area 19 the latter part of January.

A total of 9 statistical areas were covered. In each area one 3-hour tow was made in each of six depth ranges. A 45-foot shrimp trawl was used. Most of the catches were brown shrimp, although there were some small catches of white shrimp. The largest catch was 47 pounds of brown shrimp, 12-15 count heads on, in area 14 in 40-60 fathoms. The next largest catch was in 20-40 fathoms in area 15, and it consisted of 35 pounds of brown shrimp 15-20 count heads on.



Industrial Products

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, January 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for January 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the following table.

	Meal Short Tons	Oil 1,000 Gallons	Solubles Short Tons	Homogenized Short Tons
January 1962:				
East & Gulf Coasts . .	661	35	117	20
West Coast ^{2/}	2,010	39	1,452	-
Total	2,671	74	1,569	20
January 1961 Total . .	2,723	55	1,064	65

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

Major Indicators, February 1962:

Item and Period	1962	1961	1960	1959	1958
..... (Short Tons)					
<u>Production ^{2/}:</u>					
February	^{1/}	2,071	1,923	2,128	1,842
January	2,670	2,713	2,433	3,095	2,075
December	-	12,750	9,185	14,381	14,836
Jan.-Dec. ^{3/}	-	289,039	257,969	275,396	226,299
Jan.-Dec. final totals	-	^{1/}	290,137	306,551	248,140

(Table continued on following page.)

Fish Meal Production and Imports (Contd.)					
Item and Period	1962	1961	1960	1959	1958
..... (Short Tons)					
Imports:					
February	1/	14,344	8,081	19,463	11,219
January	1/	9,531	8,571	19,700	7,696
December	-	23,268	15,564	5,538	8,490
Jan.-Dec. totals ...	-	217,845	131,561	132,955	100,352

Fish Solubles Production and Imports					
Item and Period	1962	1961	1960	1959	1958
..... (Short Tons)					
Production 4/:					
February	1/	1,502	1,812	2,211	1,133
January	1,590	1,129	1,392	1,828	825
December	-	4,606	2,897	5,430	6,305
Jan.-Dec. totals ...	-	109,780	98,929	165,359	130,177

Imports:					
February	1/	155	1,875	398	149
January	1/	219	214	954	473
December	-	472	60	420	5,180
Jan.-Dec. totals ...	-	6,739	3,174	26,630	14,567

Fish Oil Production and Exports					
Item and Period	1962	1961	1960	1959	1958
..... (1,000 Gallons)					
Production:					
February	1/	44	51	38	49
January	75	55	46	64	46
December	-	1,488	1,038	1,865	1,839
Jan.-Dec. 3/ 5/ ...	-	33,471	26,690	24,418	21,957
Jan.-Dec. totals ...	-	1/	27,886	24,978	22,028

Exports:					
February	1/	2,327	3,177	999	1,038
January	1/	1,793	276	898	825
December	-	1,398	2,108	2,611	383
Jan.-Dec. totals ...	-	16,331	19,155	19,264	12,539

1/Not available.
 2/Does not include crab, shrimp, and miscellaneous meals.
 3/Preliminary data computed from monthly data.
 4/Includes homogenized fish.
 5/Represents over 95 percent of the total production.
 Note: Data for 1961 are preliminary.

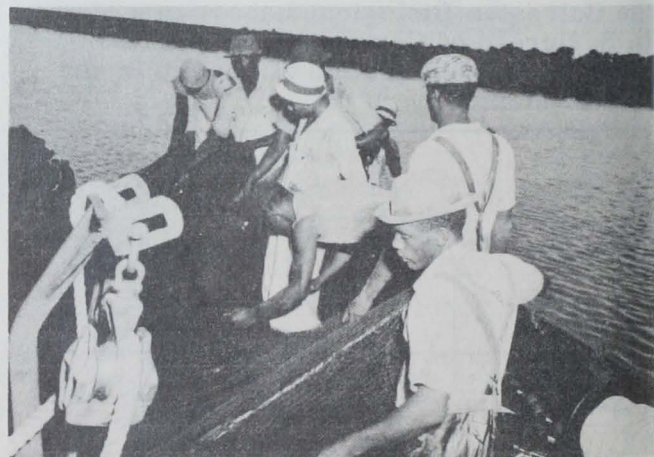
Production and Foreign Trade, 1961: During 1961, meal and scrap production amounted to 289,000 tons--9,200 tons above 1960. The marine animal oil yield totaled 33.5 million gallons--a gain of 5.6 million gallons compared with 1960.

Imports of fish meal in 1961 (218,000 tons) were 66 percent greater than in 1960, and imports of fish solubles (6,739 tons) were up 112 percent. Exports of fish oils and fish-liver oils in 1961 amounted to 122 million pounds (16.3 million gallons)--21.2 million pounds (282,300 gallons) below 1960.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, 1961 with Comparative Data		
Product	1961 1/	1960
..... (Short Tons)		
Fish Meal and Scrap:		
Alewife	89	1,092
Herring:		
Alaska	3,810	6,103
Maine	1,239	2,915
Menhaden 2/	246,990	218,423
Sardine, Pacific	2,744	3,508
Tuna and mackerel	21,432	26,499
Unclassified	12,735	21,288
Total	289,039	279,828
Shellfish and marine animal meal and scrap		
	10,000	10,309
Grand total meal and scrap ...	299,039	290,137
Fish solubles		
	98,003	89,377
Homogenized condensed fish ...		
	11,777	9,552
..... (Gallons)		
Oil, body:		
Alewife	6,900	73,950
Herring:		
Alaska	727,517	1,385,218
Maine	-	132,973
Menhaden 2/	30,814,537	24,453,736
Sardine, Pacific	83,010	160,121
Tuna and mackerel	751,590	509,195
Other (including whale)	1,087,610	1,137,782
Total oil	33,471,164	27,852,975

1/Preliminary data.
 2/Includes a small quantity produced from thread herring.
 Note: Excludes liver oils.

Table 2 - U. S. Foreign Trade in Selected Industrial Products, 1961 with Comparative Data		
Product	1961 1/	1960
..... (Short Tons)		
Imports:		
Fish meal and scrap	217,845	131,561
Fish solubles	6,739	3,174
..... (Gallons)		
Whale oil, sperm (crude and refined)	7,807,625	4,836,847
..... (Pounds)		
Exports:		
Fish and fish-liver oils	122,485,721	143,659,471
Whale and sperm oil	1,205,674	1,400,714
1/Preliminary data.		



At Empire, La., after a day's fishing, the purse-seine net used to fish menhaden is inspected for torn webbing by pulling it from one purse boat to the other.

Supply, 1960-61: As compared with 1960, fish meal production in the United States in 1961 was up 3.2 percent and imports 65.6 percent, which means that the available supply in the United States was 22.6 percent greater. Fish solubles production was up 11 percent and imports were up 112.3 percent, which means that the available supply of fish solubles was up 14 percent.

Table 1 - U.S. Supply of Fish Meal and Solubles, 1961 and 1960

Item	1961 ^{1/} / 1960	
 (Short Tons)	
Fish Meal and Scrap:		
Domestic production:		
Menhaden	246,990	218,423
Tuna and mackerel	21,432	26,499
Herring, Alaska	3,810	6,103
Other	26,807	39,112
Total production	299,039	290,137
Imports:		
Canada	38,218	30,982
Peru	151,439	68,156
Chile	12,074	21,183
Angola	1,543	888
So. Africa Republic	13,026	7,073
Other countries	1,545	3,279
Total imports	217,845	131,561
Available fish meal supply .	516,884	421,698
Fish Solubles:		
Domestic production^{2/} ..		
	109,780	98,929
Imports:		
Canada	1,001	869
Denmark	28	1,858
Other countries	5,710	447
Total imports	6,739	3,174
Available fish solubles supply	116,519	102,193

^{1/}Preliminary.
^{2/}50 percent solids. Includes production of homogenized condensed fish.

From 1960 to 1961 the production of fish oil in the United States rose 20.2 percent, with most of the increase in menhaden.

Table 2 - U.S. Production of Fish Oil, 1961 and 1960

Product	1961 ^{1/} / 1960	
 (1,000 Gallons)	
Menhaden	30,815	24,454
Herring, Alaska	728	1,385
Tuna and mackerel	752	509
Sardine, Pacific	83	160
Other	1,093	1,345
Total	33,471	27,853

^{1/}Preliminary.
Note: Does not include fish-liver oil.

United States imports of fish meal were principally from Peru which supplied 69.5 percent of the total, followed by Canada, South Africa Republic, and Chile.

United States exports of fish oil from 1960 to 1961 dropped off 14.7 percent principally because West Germany, the Netherlands, and Sweden bought considerably less. Partially this was offset by greater purchases by Canada, Norway, and other countries.

Table 3 - U.S. Supply of Fish Meal and Solubles, 1951-1961 (Dry-Weight Basis)

Year	U.S. Production ^{1/}		Imports		Total
	Tons	Percent	Tons	Percent	
1961 ^{2/}	353,695	61.5	*221,215	38.5	*574,910
1960	339,601	71.8	133,148	28.2	472,749
1959	*389,231	72.5	147,392	27.5	536,623
1958	313,228	74.3	108,167	25.7	421,395
1957	325,221	79.0	86,297	21.0	411,518
1956	360,207	79.6	92,089	20.4	452,296
1955	319,962	76.2	99,692	23.8	419,654
1954	314,482	68.1	147,584	31.9	462,066
1953	320,345	70.9	3/131,473	29.1	451,818
1952	291,885	58.9	3/203,539	41.1	495,424
1951	260,120	66.9	3/128,478	33.1	388,598

^{1/}Includes homogenized condensed fish.
^{2/}Preliminary.
^{3/}Imports of meal only. Data not available on imports of solubles.
* Record.
Note: Wet weight of solubles and homogenized condensed fish have been converted to dry weight by reducing their poundage by one-half.

Table 4 - U.S. Exports of Unclassified Fish Oil, 1961 and 1960

Destination	Total	
	1961	1960
 (1,000 Lbs.)	
Canada	16,935	9,846
Sweden	20,641	36,026
Norway	31,277	15,914
Netherlands	25,586	53,133
West Germany	15,590	26,083
Other countries	12,457	2,657
Total	122,486	143,659



Jellyfish

RESEARCH GRANT AWARDED TO UNIVERSITY OF MIAMI:

A grant of \$14,143 has been awarded to the Institute of Marine Science of the University of Miami by the U. S. Public Health Service. It is to be used for continuing research on the Physalia, more commonly known as the Portuguese Man-of-War, a type of jellyfish sometimes found in the surf and on the beaches of Florida.

The research on this animal has been going on for four years, during which much has been learned about the structure of the animal, how it survives, and its mode of living. For example, its float has been found to contain carbon monoxide, unique in animals of either the sea or land.

The poison contained in the tentacles, it has been ascertained, is a protein similar to cobra venom and nearly as poisonous. This

accounts for serious stings received by ocean bathers when they come in contact with the *Physalia*.

It is not yet known just how the *Physalia* makes either the poison or the carbon monoxide. These questions are now being studied along with attempts to find a remedy for the sting. (February 1962 news release from Institute of Marine Science.)



Maine Sardines

EXTENDED CANNING SEASON NOT PRODUCING:

A continued scarcity of fish has resulted in a virtual total failure as of mid-February 1962 of Maine's extended sardine canning season. With only 6,900 cases packed December 1 to February 9, even the most optimistic canners, fishermen, and factory workers are wondering if they now won't have to wait for the usual spring runs of fish. (The normal season ended on December 1, 1961.) There were high hopes for sizable catches during the favorable February tides, but these did not materialize.

The bulk of the fish packed was produced by one Portland plant during the first two weeks of December and the only other action has been occasional small catches in eastern Washington County waters. Even these few fish have generally been too small to can profitably and most of them have gone to the fish meal and pearl essence plants.

Meanwhile the meager 679,000 cases produced during the regular 1961 season have been practically all sold and the shortage in the markets is getting acute. The average annual pack for the previous 20 years was 2.2 million cases.

The industry is now comparing the present situation with the summer of 1938 and winter of 1939 when the last critical fish shortage occurred. Conditions were very similar but corrected themselves during the spring and summer of 1939 when a total of 2,175,000 cases was packed.

Just before the regular April 15 to December 1 legal canning season closed last fall, the Maine Legislature, in Special Session, granted the canners an extension to

permit sardine canning on a year-around basis until January 1, 1963.

This action was taken in anticipation of a sizable winter pack which would provide much needed employment in the coastal areas and permit the canners to replenish their inventories and keep their customers supplied.

Although there is great disappointment in the industry over the failure of winter fishing for the first half of the period, all concerned figure that the odds are with 90 years of history in regards to the 1962 summer pack. "We cannot find any record of two really poor fish years in a row since the industry was founded in 1872," the Executive Secretary of the Maine Sardine Council stated.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SPRING 1962:

The United States domestic catch of fish and shellfish during 1961 amounted to 5.1 billion pounds--about 200 million pounds more than in 1960. These landings had a value to fishermen of \$364 million, about \$10 million more than in the previous year. Fish and shellfish for human consumption comprised about 2.5 billion pounds of total catch. The remainder was used for the manufacture of industrial products, bait, and animal food.



At a plant in Tampa, Fla., hand labor is used in peeling shrimp in order to produce a butterfly-fantailed breaded shrimp product.

During the spring months of 1962, per capita consumption of fishery products probably will increase slightly, and prices will remain moderately high. Retail prices for fishery products advanced during 1961, and are expected to remain at that high level until summer.

Supplies of fish and shellfish during the early spring months should be about the same as last year. Although

frozen inventories are presently at a low level, many fisheries will resume full operations with the beginning of spring weather.

Imports of edible fishery products into the United States during 1961 were greater than those of 1960. Continued high imports are expected early in 1962, especially for groundfish fillets and blocks, canned tuna, and shrimp. Exports of edible fishery products during 1961 were by far the lowest on record and prospects for increased shipments during the early months of 1962 are not bright.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 1962 issue of The National Food Situation (NFS-99).



Great Lakes Fisheries

Exploration and Gear Research

EXPLORATORY FISHING IN SOUTHERN LAKE MICHIGAN:

M/V "Kaho" Cruise 1: The U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel Kaho was scheduled to begin its exploratory fishing operations on February 20, 1962, in the southern half of Lake Michigan from Ludington, Mich., on the eastern shore to Two Rivers, Wis., on the western shore.

The general plan of Cruise 1 of the Kaho was to conduct exploratory trawl fishing operations at various depths and areas in southern Lake Michigan at intervals of approximately 3 weeks.

The primary purpose of the cruise was to determine the location, bathymetric distribution, relative abundance, and seasonal availability of various species of fish to standard otter trawls. The information obtained was to help Lake Michigan fishermen determine the most productive trawling grounds.

The secondary purpose of the cruise was to collect data on the physical characteristics of the 154-fathom deep waters of Lake Michigan north of Ludington, Mich., in cooperation with the U. S. Department of Health, Education, and Welfare. This program was designed to determine the extent and effects of domestic and industrial wastes coming into Lake Michigan--both now and in the future.

Echo-sounding equipment was to be used to survey the bottom and detect subsurface fish concentrations. A 50-foot (headrope) Gulf of Mexico-type otter-trawl net was to be towed in representative areas to assess the commercial trawling potential. Bathythermograph casts and water samples were to be taken at the 154-fathom depth.

Note: See Commercial Fisheries Review, January 1962 p. 17.



North Atlantic Fisheries Exploration and Gear Research

MIDWATER TRAWLING OPERATIONS START OFF NEW ENGLAND FOR 1962:

M/V "Delaware" Cruise 62-1 (Jan. 22-31, Feb. 6-15, 1962): Pelagic fishery explorations during the latter part of January and the first part of February 1962 were continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. Principal effort was devoted to scouting with sonic sounding and scanning equipment to locate schools of fish on or off the bottom.

The cruise was divided into two parts. During the first part most of the activity, which extended over a 10-day period, was spent along the edge of the continental shelf between the depths of 40 and 120 fathoms and in the areas bracketed by the Nantucket Light Vessel and Hudson Canyon.

Much of the time was spent close to known scup or porgy and butterfish fishing areas. Virtually no fish schools were seen in midwater (on echo-sounding equipment). The only indications of midwater life observed were sampled with a midwater trawl and proved to be Euphausids (small shrimp-like crustaceans) and small deep-sea fish.

It is significant that commercial vessels working in the same area as the Delaware during this portion of the cruise had difficulty in obtaining good catches. The low availability of fish in midwater and typical winter weather conditions both contributed to poor catches with midwater trawl equipment.

During the second part of the cruise, operations were conducted in the Gulf of Maine

where effort was concentrated on a search for sardine-size herring. Areas scouted included the coast of Maine from Portland to West Quoddy Head and selected offshore areas. Coastal searches were made in depths between 20 and 60 fathoms. Offshore scouting was done over Grand Manan Bank and around Mt. Desert Rock. Otter trawl tows were made in a deeper-water area (80-110 fms.) 20 miles SW. by S. of Matinicus Rock near Toothaker Ridge.

Fish traces were found in an area approximately $7\frac{1}{2}$ miles south of Cape Small in depths of 45 to 48 fathoms. On February 7 the fish traces were searched within 10 fathoms of the bottom during daylight hours and appeared to be concentrated into groups which were variously distributed along the bottom; they varied from widely separated to thickly concentrated groupings. After dark, the fish were found to have risen to within 3 to 5 fathoms of the surface. The thickness of the schools varied from 2 to 12 fathoms.

Two 1-hour sets were made on those soundings with a midwater trawl. The trawl was capable of catching herring but not specifically designed for catching very small fish. Six bushels of herring averaging 5 inches in total length were retained in the small-mesh cod-end in the first tow and one bushel was taken in the second. The largest school sounded in that area was approximately 2 miles in length. Another smaller, less dense school of approximately $1\frac{1}{4}$ miles length was sounded 3 miles to the eastward of the first school.

A shallow surface school of small-herring was observed during the night of February 13 in a position approximately 2 miles SW. of Matinicus Rock. These fish could not be detected with sounding gear because apparently none of them were deep enough to pass under the vessel.

No further significant midwater or off-the-bottom traces of sardines were found. Four out of five bottom tows in the Toothaker Ridge area produced small quantities of sardines, although none of those had been detected on the sonic equipment. In general, the sardines were about the size of the in-shore herring, although taken from deeper water. Their average length was about 5 inches and their length range was from about 4 to 7 inches.

Only one large "sea herring" was taken and that was during a bottom tow at 80 fathoms depth.

Note: See Commercial Fisheries Review, Dec. 1961 p. 41.

* * * * *

NEW VESSEL PLANNED TO REPLACE M/V "DELAWARE":

Work on designing a new stern trawler for year-round exploratory fishery research in the Northwest Atlantic by the U. S. Bureau of Commercial Fisheries will begin at once, the Department of the Interior reported today.

The vessel will replace the 24-year-old Delaware which now is used as an exploratory fishing and gear research vessel by the Bureau. The new vessel, 125 to 150 feet long, will be designed as a more efficient exploratory craft and will, like the Delaware be based at Gloucester, Mass.

George G. Sharp, Inc., marine designers of New York City, has been awarded a contract for preparing plans and specifications for the vessel.

The deck and gear arrangement will feature a mechanical and, as far as possible, automated method of handling otter-trawl fishing gear. It will also be adaptable to methods of fishing other than trawling, such as long-lining, gill-netting, and purse-seining.

The deckhouse and the below-deck arrangements will conform to the specialized requirements of marine researchers. Adequate space and facilities are to be provided for fish-finding devices and other electronic equipment. Laboratories and living accommodations for as many as seven scientists will be provided on the main-deck and second-deck areas.

Design of the vessel is expected to require approximately eight months. Construction will begin shortly thereafter.



North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER

M/V "John N. Cobb" Cruise 53: The U.S. Bureau of Commercial Fisheries announced

a cruise (February 26-March 23, 1962) of its exploratory fishing and gear research vessel John N. Cobb to sample marine bottom fauna in waters south of the Astoria Canyon and west-southwest of Tillamook Head, Oreg., in 10 to approximately 700 fathoms of water and west of Destruction Island between Cape Elizabeth and Umatilla.

The primary purposes of the cruise were (1) to monitor marine fauna at stations along previously established track line off the mouth of the Columbia River and to collect samples for radiological analysis by the Laboratory of Radiation Biology at the University of Washington, and (2) to locate stations west of Destruction Island suitable for future re-surveying. The cruise would provide information on the seasonal distribution and abundance of demersal fish and invertebrates in the survey areas, as well as basic information on latent marine resources. Records were to be maintained of oceanographic and meteorological conditions as well as bottom topography. Biologists from the Oregon Fish Commission expected to tag Dover sole caught in deep water to study their rates of growth and migratory habits. The National Museum was to collect rare species of fish during the survey.

A standard otter trawl net was to be towed for one hour to sample marine life at each trawlable station. Sonic equipment was to be used as an aid in locating trawlable bottom.

Note: See Commercial Fisheries Review, Sept. 1961 p. 35, Nov. 1961 p. 26.

North Pacific Fisheries Investigations

BUREAU GETS NEW RESEARCH VESSEL:

Permission was received late in 1961 to proceed with the procurement of a 175-foot vessel (coastal refrigerator and supply type) for high-seas research in the North Pacific Ocean. As of December 28, 1961, the vessel was officially released by the U. S. Navy to the U. S. Bureau of Commercial Fisheries.

In conjunction with the Bureau's new vessel, continued charter of private vessels is contemplated. A contract has been signed with the owners of the Bertha Ann for a 75-day high seas research cruise in the North Pacific.

Oceanography

NEW OCEAN SURVEY TO COVER AREA NEAR BAHAMA ISLANDS:

On the first leg of a six-months oceanographic survey of the area between the "Sargasso Sea," Virginia Capes, and Puerto Rico, the Survey ship Explorer sailed from Norfolk, Va., on February 19, 1962, the Coast and Geodetic Survey, U. S. Department of Commerce, announced in February. The objective of the project for 1962 is to probe more than 250,000 square miles of the dangerous "Hurricane Belt" north of Puerto Rico and east of the Bahama Islands before the autumn storms arrive.



Fig. 1 - Coast and Geodetic Survey ship Explorer.

Plans call for 52 oceanographic probes to study the physical, chemical, geological, and magnetic aspects of the ocean environment. One "station" will be directly over the 30,000-foot Bronson Deep, believed to be the greatest depth in the Atlantic Ocean.

The Agency's oceanographers are confident that this systematic survey will produce an unprecedented assortment of data on currents, bottom topography, sound velocity structure, water chemistry, and the earth's magnetic field. At 23 of the oceanographic "stations," bottom sediment cores will be taken and preserved in plastic tubes for future examination.

The Coast and Geodetic Survey has a long record of oceanographic investigations along the continental shelf of the United States and in the waters around Puerto Rico. In the 1870's, the Survey made a thorough

study of the complex Gulf Stream. But the work planned this year is the first effort to methodically comb the vast area joining the western boundary of the "Sargasso Sea." Here the brown Sargasso weed is found floating in great masses in what oceanographers term a region virtually devoid of major ocean currents.



Fig. 2 - Preparing Nansen bottle for lowering to record temperature and test the salinity of sea water.

The 220-foot Explorer carries a complement of 12 officers, 77 crewmen, and additional scientific personnel. The ship is outfitted with precision depth-recorders, a Loran C navigational control system, and a maze of oceanographic equipment for taking water temperatures, salinity, and water samples; measuring weather and sea swell conditions; and recording variations in the earth's magnetic field. A torpedo-shaped instrument known as the Varion Proton Magnetometer is towed about 500 feet astern at all times while the ship is under way.

In an effort to learn more about ocean currents, the Explorer will release more than 5,000 drift bottles during the cruise. These will drift freely with the current--perhaps finding their way to the beaches of

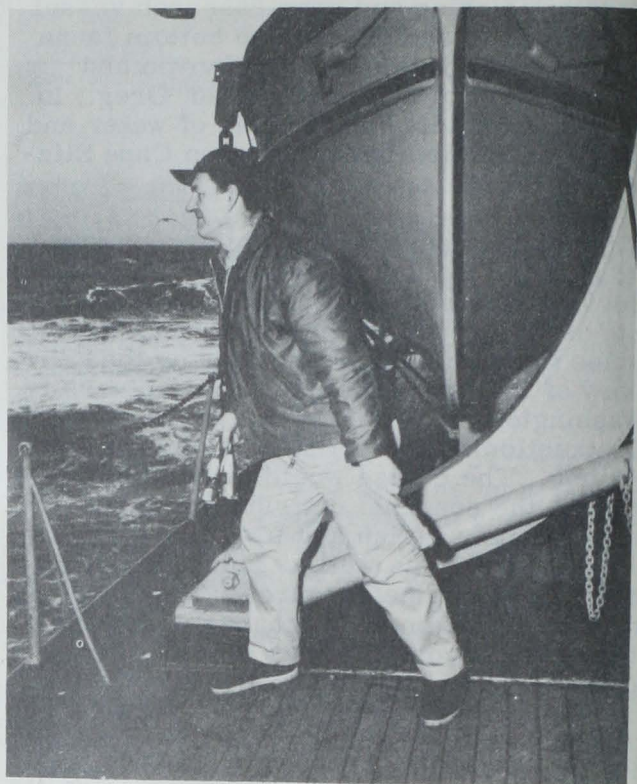


Fig. 3 - Tossing a drift bottle over the side of the Explorer.

the United States, Great Britain, or France or remaining adrift at sea for years. A card, tucked neatly inside the "pop"-sized bottle, asks the finder to mark on it the time and place he found the bottle and to send the card to the U. S. Coast and Geodetic Survey headquarters in Washington, D. C.

The oceanographic work will be accomplished during the passage of the Explorer from her home port of Norfolk to the 1962 working area around the Island of Puerto Rico. Throughout the season, the ship will remain in the coastal waters of Puerto Rico, undertaking hydrographic work for six-week periods, and then return to Norfolk for about two weeks. This should permit about six deep-sea sounding lines to be run about 60 miles apart. Eventually, the line spacing will be reduced to 10 miles to meet ocean survey specifications. New hydrographic work around Puerto Rico has been scheduled this year as part of the Coast and Geodetic Survey's basic nautical charting program.

Oceanographic studies such as the one to be undertaken by the Explorer during

1962 are becoming increasingly vital to the nation's commerce and defense. Part of the area to be probed, east of the Bahama Islands, is part of the Cape Canaveral down-range tracking area.

* * * * *

GRANT FOR SERIAL ATLAS OF NORTH ATLANTIC MARINE ENVIRONMENT:

A grant of \$47,660 from the National Science Foundation for support of a Serial Atlas of the Marine Environment of the North Atlantic was received by the American Geographical Society. The atlas project is being undertaken in cooperation with other scientific institutions here and abroad. The atlas will be issued as individual folios, in much the same way that a journal is published. Unlike a journal, however, it will have no regular publication dates. The announcement of the grant was made by the Society on February 22, 1962.

The first folio of the atlas, "Sea Surface Temperature Regime of the Western North Atlantic, 1953-54," is to be published this spring. It consists of 55 maps showing a great volume of surface temperature observations collected by commercial vessels at sea and bringing out detailed, month-to-month patterns of differences in surface temperature. The author is a meteorologist with the U. S. Bureau of Commercial Fisheries.

Maps and preliminary data for three other folios have been submitted. These include a study of the biogeography of the clam *Spisula polynyma* by an employee of the U. S. Bureau of Commercial Fisheries; average temperature at a depth of 200 meters (the depth at which temperatures remain constant throughout the year), by a member of the Woods Hole Oceanographic Institution; and a study of the distribution of more than 130 species of fish found off Georges Bank between Cape Cod and Nova Scotia.

Each folio of the atlas will consist of a map or series of maps dealing with an aspect of oceanography. As the folios grow in number, the atlas is expected to present a comprehensive range of studies in all disciplines dealing with the sea. By pointing up comparisons and patterns and by showing up gaps in knowledge, the atlas may also serve as a guide for future research.

Nineteen base maps, each covering a section of the North Atlantic and Arctic Ba-

sins, have been compiled by the Society. These are issued to scientists, on request, for use as work sheets on which the scientists' own findings are plotted. Each study is evaluated by a panel of experts and the society's cartographers prepare finished maps for publication. More than 200 individual scientists in 20 countries have so far requested one or more of the base maps.

Note: See Commercial Fisheries Review, May 1961 p. 19.



Oysters

RESEARCH PROGRESS ON MORTALITIES:

Research progress on heavy oyster mortalities that have occurred for the past few years in certain Middle Atlantic areas was summarized at a conference at Solomons, Md., on January 23 and 24, 1962. Forty scientists met at the University of Maryland's Chesapeake Biological Laboratory for their Fourth Annual Conference on this topic. They exchanged ideas and information on the parasites causing the losses. The biologists represented various universities and state and Federal agencies of the Gulf, Atlantic, and Pacific Coasts.

On balance, the present situation was found to be moderately encouraging. No new spread of the MSX oyster blight was reported, the beginnings of recovery were noted in Delaware Bay, and understanding is emerging on the use of waters of low salinity in protecting oyster production. Knowledge of various imported parasites is rapidly increasing. On all of these points and others, however, scientists stated the urgent need for additional knowledge.

Oyster losses along the Middle Atlantic Coast were the major topic of discussion. Biologists from Delaware Bay report improved survival of native oysters in 1961, and suggest that resistant strains may be developing. Total production will, however, remain very low. The Virginia scientists report little change in the mortality pattern. Heavy losses continue and as yet show no indication of decreasing in the lower Chesapeake areas, which have been affected.

The scientists are glad to find that their pooled information indicated no new spread of the blight. Research in the laboratory and in the natural environment supports the idea that low salinity protects oysters from MSX.

The conference yielded much new information about several of the causes of oyster losses and showed rapid advance in knowledge since MSX was discovered in 1957. Detailed discussions were concerned with the possible life history of this organism, the methods of transmitting MSX into oysters, the other parasites which have recently been discovered, and the best methods of developing resistant strains.

At the end of the conference, suggestions were made for future research. These included thorough studies on the distribution of parasites and mortalities, laboratory tests of the effects of low salinity, research on the life histories of parasites, tissue-culture studies of effects of parasites on oyster, further checks to understand the methods by which oysters are infected, and increased attention to the production of resistant strains of oysters.



Preservation

REVIEW OF STUDIES TO EXTEND STORAGE LIFE OF FRESH FISHERY PRODUCTS BY IRRADIATION:

The use of irradiation as a means of extending the storage life of fresh fishery products has been under study jointly by the U. S. Bureau of Commercial Fisheries and the U. S. Atomic Energy Commission. On February 2, 1962, in the Department of Food Technology at the Massachusetts Institute of Technology, Boston, Mass., there was a demonstration of preserving fresh fishery products by irradiation. The occasion of the demonstration was a meeting of a special committee of the National Fisheries Institute designated to review the progress that has been made by the Atomic Energy Commission in its investigation of the use of radiation as a means of locking in and preserving the ocean-fresh flavor of fresh fish and shellfish.

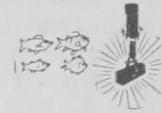
The demonstration consisted of exposing fresh-caught haddock to radiation from a cobalt-60 radiation apparatus.

After this demonstration, the conference group, consisting of scientists and prominent members of the fishing industry, traveled to Gloucester, Mass., where taste tests were conducted, the group enjoying the taste of

haddock and clams that had been irradiated by cobalt-60 rays more than three weeks earlier. The taste tests were conducted at the Bureau's Technological Laboratory in Gloucester.

The Bureau's Technological Laboratory, which conducts studies of the physical and chemical factors that affect the flavor and odor of fish and shellfish, is hopeful that the demonstration of irradiation preservation methods may prove to be a significant milestone of progress in the Bureau's efforts to help the fishing industry provide attractive ocean-fresh fishery products for the American table.

Note: See Commercial Fisheries Review, Feb. 1961 p. 25.



Salmon

MORE CHINOOK EGGS TAKEN AT COLUMBIA RIVER HATCHERIES IN 1961:

A total of approximately 65 million eggs from fall chinook or king salmon were taken at the Bureau's Columbia River Fisheries Development Program hatcheries in 1961. This is an increase of about 2,350,000 eggs over the number taken in 1960. Fish hatched and reared from the eggs will be liberated in the Columbia River and its tributaries this spring (1962).

In coordination with the rearing and release of these hatchery fish will be a large-scale program of marking of young fish in order to evaluate hatchery production. Approximately 5,750,000 fingerlings will be marked by excision of fins. The marking will be conducted at all program hatcheries rearing fall chinook salmon, and it is expected that most of the work will be done this spring, just prior to the release of the fish.

* * * * *

STUDY OF HOW JUVENILE KINGS MIGRATING DOWNSTREAM REACT TO LARGE DAMS:

The first phase of a cooperative state and Federal three-year study of how juvenile king salmon migrating downstream react to large reservoirs began the latter part of February 1962 when 750,000 hatched salmon were released in a tributary of Shasta Lake. The fish were supplied by the

Coleman National Fish Hatchery and planted by California's Department of Fish and Game.

Primary objective of the study is to find out how large impoundments such as Shasta Lake affect the young salmon's ability to migrate downstream to the ocean. The information is needed to help evaluate the overall effects of proposed large dams on salmon resources in California and other western states.

Fisheries biologists note that getting adult salmon around the proposed dams so they can spawn in upstream tributaries is only half of the problem. They point out the possibility that the young salmon would not negotiate the reservoir to the dam area where they could be bypassed to the river below. This, they note, would either substantially reduce or entirely eliminate valuable salmon runs.

The study is being supported financially by California's Department of Water Resources and the U. S. Fish and Wildlife Service. California's Department of Fish and Game is conducting the study and will be operating sampling nets in Shasta Lake for the next two years.

* * * * *

POND-REARED SILVERS RELEASED INTO THE COLUMBIA RIVER:

Nearly 40,000 yearling silver salmon were liberated into the Columbia River early in March at the conclusion of the Oregon Fish Commission's first season of natural pond-rearing salmon activities at Wahkeena Pond, a 20-acre impoundment bordering the Columbia River highway U. S. 30, a mile west of Multnomah Falls, Multnomah County.

In an experiment to test the feasibility of raising salmon fingerlings in natural ponds without the benefit of artificial feeding, the pond was stocked with 101,000 silver fingerlings in May 1961. During the ensuing months the young fish fed only on insects and other natural foods available in the impoundment.

The Commission in charge of the pond-rearing experiment termed results of the first season's test "most promising." On the basis of the limited experiments in pond-rearing to date, a survival of 30 percent of the fingerlings stocked to the yearling release size is considered good. With 39,900 silvers counted out, the Wahkeena program

has resulted in a 40 percent survival rate. The young salmon average 4 inches in length, about the size of "wild," stream-reared silvers of the same age. Detailed laboratory examination of sample specimens showed the fish to be in excellent physical condition.

Construction of the new fish-rearing lake was financed by Federal funds, made available to the Commission through the provisions of the Columbia River Fisheries Development program. This Federal aid plan is designed to alleviate some of the damaging effects of the Columbia River fisheries due to dam construction on the Columbia River and its tributaries.

Although a small percentage of the fish released during the past few days will return to the Wahkeena outlet this coming fall as "jacks," most of those surviving the rigors of ocean life will return as adult spawners during the fall of 1963.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS AS OF FEBRUARY 15, 1962:

Item and Period	1962	1961	1960	1959	1958
..... (1,000 Lbs., Heads-Off)					
Total landings, S. Atl. & Gulf States:					
February	1/	3,901	3,785	3,227	4,007
January	4,500	5,677	5,401	4,310	5,254
January-December.	-	90,560	141,035	130,659	116,552
Quantity used for canning, Gulf States 2/:					
February	1/	98	223	135	52
January	470	199	289	308	146
January-December.	-	15,760	28,594	24,679	26,404
Frozen stocks (end of each month) 3/:					
February	1/	37,612	29,063	27,555	16,359
January	20,674	37,842	34,332	30,858	17,963
June	-	19,416	15,338	19,283	10,664
November	-	20,668	37,264	37,334	30,211
Imports 4/:					
February	1/	8,932	7,657	7,481	4,466
January	1/	12,338	8,596	8,238	5,696
December	-	15,442	12,411	10,611	10,447
January-December.	-	126,282	113,418	106,555	85,393

1/Not available.
 2/Pounds of headless shrimp determined by multiplying the number of standard cases by 33.
 3/Raw headless only; other shrimp products not included.
 4/Reported by Bureau of the Census. Includes fresh, frozen, canned, dried, and other shrimp products.
 Note: Data for 1962 and 1961 are preliminary. January 1962 data estimated from information published in the daily New Orleans Market News Service "Fishery Products Reports."

* * * * *

NUMBER OF GULF OF MEXICO VESSELS TO SHIFT FISHING OPERATIONS TO COLOMBIA:

At least 17 vessels from Louisiana and Alabama early in March 1962 were getting ready to move to South America. Boat owners from Bayou LaBatre, Gulf Shores, and Morgan City, La., were readying a fleet of Gulf shrimp trawlers to move shrimp fishing operations to Colombia.

The shrimp vessels will operate under contract with a Colombian firm. The businessmen making the move said the reason for the move is that "we just can't make it here with these type boats." The boats average 62 to 70 feet in length and are all double-rigged for trawling in the deep waters of the Gulf of Mexico.

The trawlers will each take a skipper and a mate. Each vessel will hire 3 Colombians to make up the crew. The Colombian Government requires each boat to hire 3 Colombians. The vessels will operate out of Buenaventura on the Pacific Coast of Colombia.

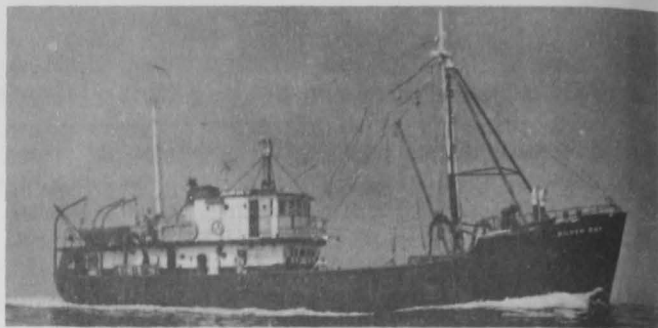
"There's been a lot of red tape," the boat owners say, in preparing for the voyage. It has taken more than two months, they report, to get the necessary clearances, working visas, and making other arrangements. The two principal boat owners say the maintenance facilities in Buenaventura are primitive and there are practically no spare parts for engines and equipment. The vessels are even taking extra otter boards because there might be difficulty in replacing them in Colombia.



South Atlantic Exploratory Fishery Program

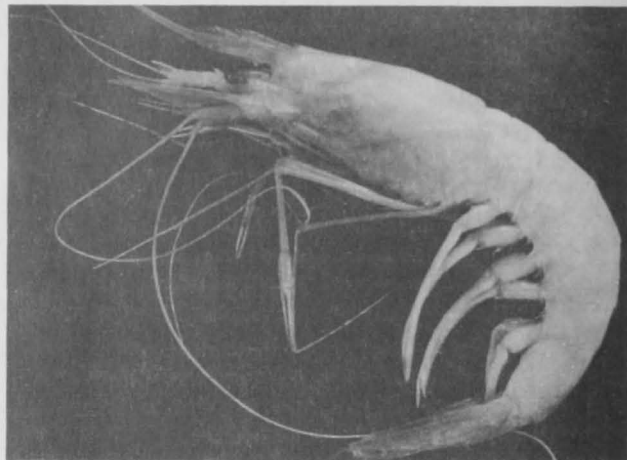
EXPLORATORY FISHING FOR ROYAL-RED SHRIMP:

M/V "Silver Bay" Cruise 36 (January 15-February 6, 1962): Assessing the seasonal availability of deep-water royal-red shrimp (*Hymenopenaeus robustus*) and conducting simulated production fishing for that species were the primary objectives of the 23-day cruise of the exploratory fishing vessel Silver Bay of the U. S. Bureau of Commercial Fisheries. The vessel, which operated along the Florida east coast, returned to Brunswick, Ga., on February 6, 1962.



M/V Silver Bay, Bureau exploratory fishing vessel.

A total of 53 drags was made between St. Augustine and Cape Canaveral in the 160-205 fathom depth range. Best catches were made between latitudes $29^{\circ}59'$ and $29^{\circ}42'$ north in depths ranging from 160-185 fathoms. In that area individual catches ranged up to 350 pounds (heads-off) of 26-30 count (not graded) royal-red shrimp per 3-hour drag. Twenty-five drags in that area from January 16-21 produced a total of 2,725 pounds (heads off) of royal-red shrimp for an average of 450 pounds per day.

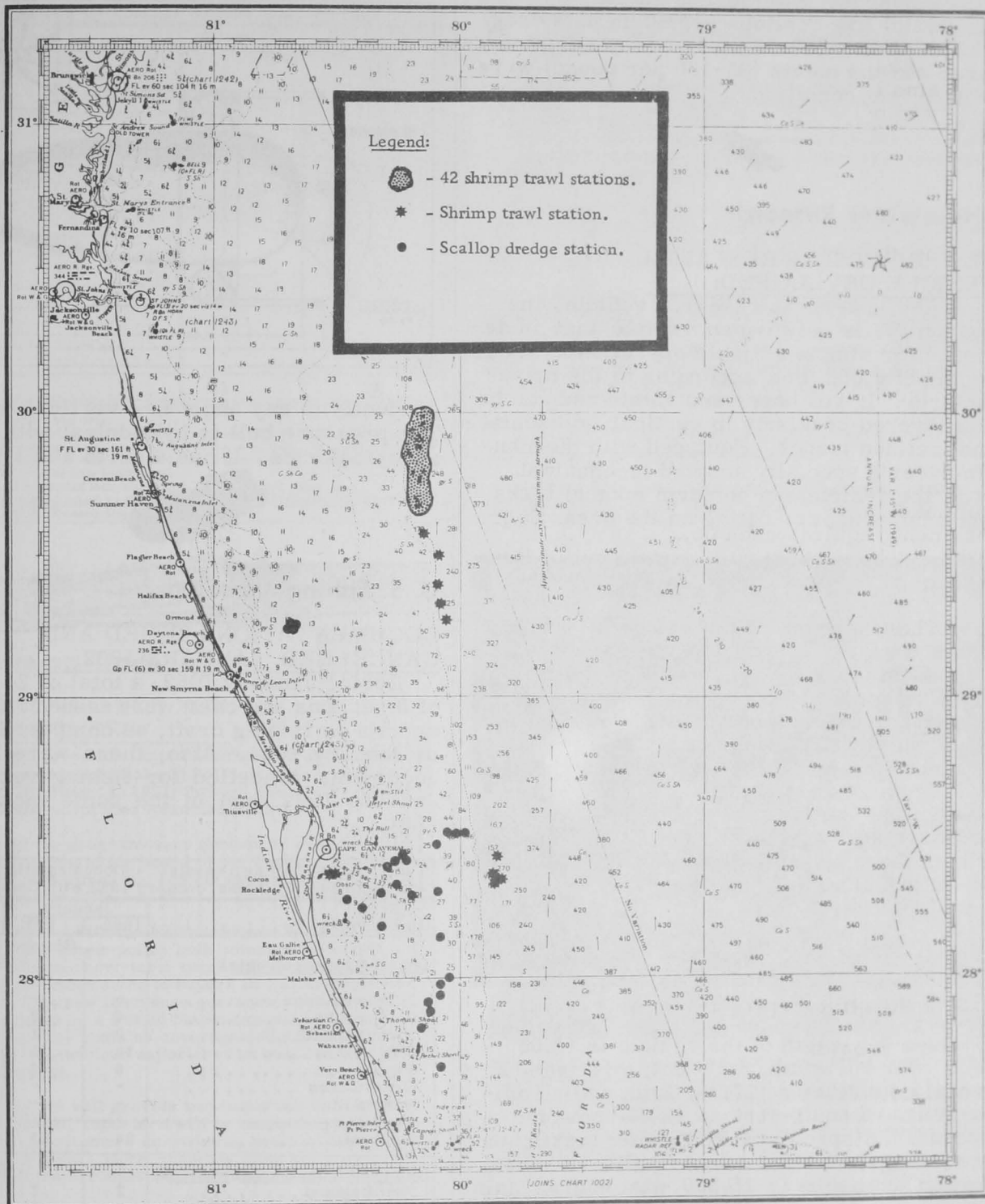


The deep-water royal-red shrimp (*Hymenopenaeus robustus*).

Of the various gear combinations tried, the most satisfactory was a conventionally-rigged 80-foot 4-seam flat trawl with 10-foot doors fished on a 30-fathom bridle.

During the last part of the cruise, deep-water shrimp trawling was demonstrated to and conducted with 4 vessels which started to commercially fish royal-red shrimp in the survey area.

Twenty-seven dredge hauls were made on the Cape Canaveral calico scallop bed to obtain samples for Bureau biologists and technologists and to obtain samples and conduct tests for cooperators. High concentrations of scallops were found off Ormand and



M/V Silver Bay Cruise No. 36 (Jan. 15, to Feb. 6, 1962).

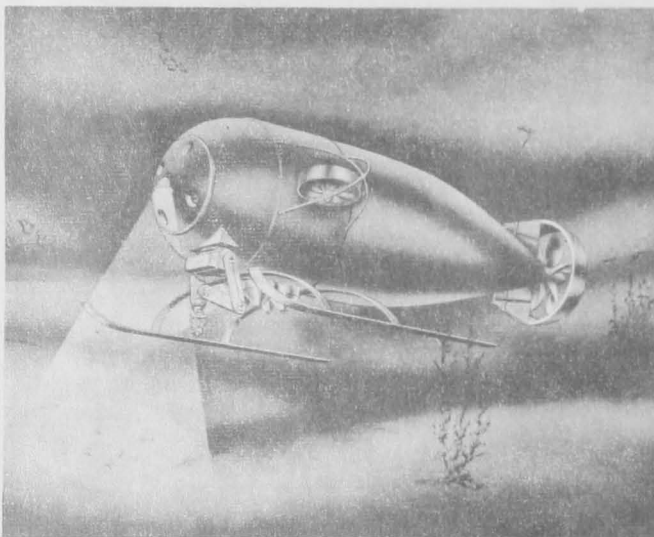
Cocoa Beaches with catches ranging up to 36 bushels of live scallops per 30-minute drag. The shell size (50-65 mm.) was medium to large and the meats (85-100 per pound) were in excellent condition.



Underwater Research

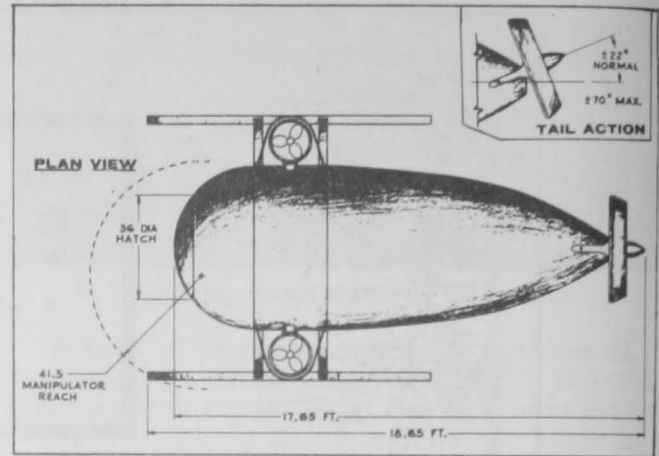
NEW UNDERSEAS RESEARCH VEHICLE DEVELOPED:

A new underseas research vehicle, the Seapup IV, is a two-man vehicle that is designed for simple reliable operation to ocean depths of 6,000 feet, according to the manufacturer. It will hover and rotate and can be maneuvered precisely in vertical, horizontal, and inclined planes. Equipped with the manufacturer's specially adapted mechanical arm, the vehicle can perform manual tasks while hovering or resting on the ocean floor.



Seapup IV, a two-man underseas research vehicle.

Over-all length of the vehicle is 18.65 feet; over-all width, 8.00 feet; total weight, including batteries, lifting fluid, and all other standard equipment, is 12,600 pounds; operational speed is 2 to 4 knots; maximum operating time when submerged is 12 hours. Power available is 15,300 watt hours. Main propulsion is provided by a 2.5-hp. D.C. motor driving a 34-inch shrouded propeller; control or lift propulsion is provided by two 1/4-hp. D.C. motors driving two 14-inch shrouded propellers. The main propulsion assembly pivots 70 degrees port or starboard, and thrust from control propulsion assemblies can be directed inde-



pendently to any angle in a vertical plane. The pressure hull is cylindrical with hemispherical ends. It has 4 ports and 1 hatch.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JANUARY 1962:

During January 1962, a total of 24 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 23 in January 1961. Also, there were 19 more documents cancelled for fishing vessels in January 1962 than in the same month in 1961.

Area (Home Port)	January		Total
	1962	1961	
..... (Number)			
Issued first documents^{1/}:			
New England	2	3	33
Middle Atlantic	-	-	12
Chesapeake	4	3	75
South Atlantic	2	1	44
Gulf	10	11	103
Pacific	6	5	149
Great Lakes	-	-	12
Puerto Rico	-	-	2
Total	24	23	430
Removed from documentation^{2/}:			
New England	2	1	20
Middle Atlantic	8	2	32
Chesapeake	2	6	28
South Atlantic	3	5	29
Gulf	13	6	104
Pacific	16	9	111
Great Lakes	5	2	17
Hawaii	1	-	-
Total	50	31	341

^{1/}For explanation of footnotes, see table 2.

Table 2-U.S. Fishing Vessels ^{1/} --Documents Issued and Cancelled, by Tonnage Groups, January 1962

Gross Tonnage	Issued 2/	Cancelled 3/
 (Number)	
5-9	6	11
10-19	7	15
20-29	1	7
30-39	3	2
40-49	-	3
50-59	1	1
60-69	2	4
70-79	1	-
80-89	1	-
90-99	1	-
130-139	1	-
140-149	-	1
150-159	-	2
280-289	-	1
300-309	-	1
330-339	-	1
420-429	-	1
Total	24	50

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
 2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 4 in 1962, 14 in 1961, 1 in 1960, 1 in 1957, 1 in 1956, 1 in 1951, and 2 prior to 1951. Assigned to areas on the basis of their home ports.
 3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

CREDIT INSURANCE FOR U. S. EXPORTERS:

Credit insurance for United States exporters, covering both overseas commercial and political risks, became available on February 5, 1962, through the newly-formed Foreign Credit Insurance Association (FCIA).

Details of the program were announced by the president and chairman of the board of the Export-Import Bank of Washington (Eximbank), and the chairman of the governing committee of FCIA.

In cooperation with the Export-Import Bank, the FCIA will insure in a single policy both commercial credit and political risks on short-term transactions resulting from United States export sales to buyers in friendly foreign countries. This new insurance guarantees payment of credits extended by a United States exporter to a foreign buyer. The policy contains coverage and provisions designed to give American exporters the best service of its kind in the world.

This program will provide two important benefits for exporters. First, exporters will be more disposed to extend credit to customers abroad and, second, they will be better able to obtain more financing from commercial banks than if the accounts were not insured.

Foreign credit insurance does not itself provide the financing required by the insured exporter. Such financing is available from commercial banks and other private financial institutions.

FCIA is an unincorporated association comprised at present of 57 capital stock and mutual insurance com-

panies. Membership is open to all responsible and qualified insurance companies. The insurance will be offered through the member insurance companies and their agents and brokers.

Credit or commercial risks to be covered include insolvency of the buyer and protracted default. Also covered will be political risks of inconvertibility of a foreign currency to dollars, cancellation or restriction of export or import licenses, expropriation, confiscation, war, civil commotion or like disturbances.

This type of insurance has long been offered to exporters in foreign countries, mostly through government agencies, but has been available only on a limited basis to United States exporters.

"This concept of meeting the need for an insurance program through private companies is in keeping with the American free enterprise system," the President of the Export-Import Bank said. "The program enables the exporter to purchase his credit insurance through a local agent or broker and eliminates any need for direct negotiations with Eximbank in Washington."

Coverage will be offered in most foreign nations except for the "iron curtain" countries.

Policies issued by FCIA will have Eximbank underwriting 100 percent of the political risks with FCIA and Eximbank sharing the credit risks with FCIA. Last September Congress enacted legislation clarifying Eximbank's authority to enter such an arrangement with private insurance companies. The bank at the same time was empowered to insure export transactions in an amount up to \$1 billion.



Harold F. Linder, president and chairman of the board of the Export-Import Bank of Washington (left) and Thomas H. Bivin, chairman of the governing committee of the Foreign Credit Insurance Association are shown at a press conference at which it was announced that the new Association will begin operation.

The first FCIA policy will cover all United States products which may be legally exported from the United States on terms of 180 days or less. In appropriate cases, this cover may be had for transactions whose terms are up to one year. As soon as practicable, policies will be made available for export transactions whose terms are as long as five years.

In all cases, terms of repayment in the transaction are not to exceed those customary for the goods in international trade.

The premium rates on short-term policies where all export sales are covered will vary according to the terms of payment and the foreign country of the buyer and they will range from 20¢ to \$1.72 per \$100 of gross invoice value.

Political risk coverage of the FCIA short-term policy is as extensive and inclusive as any to be found among insurers of international trade transactions. For example, FCIA treats any external expropriation or intervention in the buyer's business as a political risk and it is therefore covered to 95 percent of potential loss. Common practice abroad is to consider expropriation and intervention as simple default of payment with coverage of 85 percent of potential loss. Further, coverage against other acts of government such as war and civil war is broader than is usual in delineating the elements of "political risks." In supporting political risk claims, the exporter will be required to submit the "best evidence reasonably available to the insured," that the loss was covered by the policy.

EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN:

1961: The Japanese continued to buy small quantities of frozen shrimp in December 1961 in spite of high prices and light supplies.

Of the almost 9.5 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the year 1961, almost 5.8 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

In 1960, almost 3.8 million pounds of frozen shrimp were exported and re-exported from the United States--considerably less than the amount reported in 1961. In 1960, only 364,000 pounds of the total were shipped to Japan.

Type of Product	1961				1960
	Oct.	Nov.	Dec.	Jan.-Dec.	Jan.-Dec.
	(1,000 Lbs.)				
Domestic	190	69	122	2,298	259
Foreign	130	245	107	3,481	105
Total	320	314	229	5,779	364

^{1/}Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of 1961 and a strong market, that country purchased substantial quantities of shrimp from the United

States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

January-November 1961: The Japanese continued to buy small quantities of frozen shrimp the latter part of 1961 in spite of high prices and light supplies. Of the almost 8.9 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 11 months of 1961, almost 5.6 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

Type of Product	1961				
	Aug.	Sept.	Oct.	Nov.	Jan.-Nov.
	(1,000 Lbs.)				
Domestic	243	17	190	69	2,176
Foreign	254	40	130	245	3,374
Total	497	57	320	314	5,550

^{1/}Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1962:

A new reference base--1957-59=100--has been introduced in the wholesale price index computed by the Bureau of Labor Statistics of the U.S. Department of Labor. The new base was introduced with January 1962 indexes. The old base of 1947-49=100 has been superseded by the new index base. The new base has been established by the Office of Statistical Standards of the U.S. Bureau of the Budget for use by all Government statistical agencies. Conversion factors can be applied to the indexes prior to January 1962 in order to obtain index numbers which are comparable to those computed under the 1957-59=100 base (table 1).

Inclement weather throughout the country curtailed fishery landings in New England and the Great Lakes and caused disruption in shipments. Consequently the February 1962 wholesale price index for edible fishery products at 119.7 percent (using the new base of 1957-59=100) was 3.9 percent higher than in the previous month and 11.5 percent higher than in February 1961 (table 2).

From January to February 1962, wholesale prices of all items under the drawn, dressed, or whole finfish subgroup rose 8.1 percent. Landings of haddock at New England ports were light and fresh-water fish production in the Great Lakes was hampered by severe winter conditions. Large fresh drawn haddock ex-vessel prices at Boston rose 37.5 percent, New York City prices for fresh yellow pike from the Great Lakes climbed 30.2 percent, and Chicago prices

Table 1 - Conversion Factors to Change Indexes for Edible Fish and Shellfish from 1947-49 = 100 Base to New Base of 1957-59 = 100

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Multiplier 1/
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)			0.8054592
Fresh & Frozen Fishery Products:			
Drawn, Dressed, or Whole Finfish:			
Haddock, lge., offshore, drawn, fresh	Boston	lb.	0.7707129
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	0.9559214
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	0.6217294
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	0.6019765
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	0.6984324
Processed, Fresh (Fish & Shellfish):			
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	0.7156489
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	0.7136485
Oysters, shucked, standards	Norfolk	gal.	0.7416869
Processed, Frozen (Fish & Shellfish):			
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	0.7853917
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	0.9680282
Ocean perch, lge., skins on, 1-lb. pkg.	Boston	lb.	0.9337068
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	0.8701748
Canned Fishery Products:			
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	0.9861663
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	0.8353443
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	1.2317799
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	0.9670401
			1.2053840

1/To convert 1947-49 = 100 base indexes to 1957-59 = 100 base, multiply each item by the multiplier indicated.

Table 2 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			Feb. 1962	Jan. 1962	Feb. 1962	Jan. 1962	Dec. 1961 3/	Feb. 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					119.7	115.2	115.7	107.4
Fresh & Frozen Fishery Products:					118.5	112.4	113.3	106.5
Drawn, Dressed, or Whole Finfish:					118.6	109.7	115.0	112.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.10	107.4	78.1	109.3	77.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.37	117.3	110.4	105.0	94.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.86	.86	120.5	120.5	120.5	127.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.78	.74	115.7	110.5	94.0	112.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.74	.57	120.4	92.5	104.0	113.0
Processed, Fresh (Fish & Shellfish):					125.4	117.9	115.6	110.9
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.45	.36	109.3	87.4	76.5	81.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.05	.94	123.1	110.2	107.2	102.5
Oysters, shucked, standards	Norfolk	gal.	7.75	7.88	130.7	132.8	132.8	126.5
Processed, Frozen (Fish & Shellfish):					107.7	105.5	105.0	92.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	100.1	100.1	97.6	98.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.33	96.7	96.7	96.7	105.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.33	119.2	115.7	108.7	106.9
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.95	.92	112.1	108.5	108.5	83.0
Canned Fishery Products:					122.1	120.4	120.2	109.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.50	28.00	124.2	122.0	122.0	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	107.9	107.9	107.9	97.7
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.15	118.5	116.2	112.9	88.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.81	12.31	164.3	157.9	157.9	109.1

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

2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100. Conversion factors can be applied to the indexes prior to January 1962 in order to obtain index numbers which are comparable to those computed under the 1957-59=100 base.

3/Recomputed to be comparable to 1957-59=100 base indexes.

Note: January 1962 and December 1961 indexes published in Commercial Fisheries Review, March 1962 p. 27 and February 1962 p. 48 were on the old base of 1947-49=100.



Unloading a refrigerated trailer loaded with imported frozen fillets at Fulton Market, Chicago, Ill.

for fresh drawn whitefish from Lake Superior were 4.7 percent higher. With cold-storage stocks at a relatively low level, frozen Western halibut prices at New York City also rose 6.3 percent. Compared with a year earlier, February 1962 prices in the subgroup were 5.5 percent higher. Fresh haddock prices at Boston were 38.6 percent higher and Western halibut prices were up 24.0 percent. To offset the increases slightly was the 5.5-percent drop in the prices of frozen Western king salmon due to more being available and a certain amount of consumer resistance to higher prices.

Fresh processed fishery products prices rose 6.4 percent from January to February 1962. Fresh haddock fillet prices at Boston were up 25.1 percent because of the scarcity of fresh haddock. Also, fresh shrimp prices at New York City continued to climb and rose 11.7 percent because of very light landings. More plentiful supplies and a slight drop in demand caused fresh shucked oyster prices at Norfolk to drop 1.6 percent, but this was before the damaging March high tides hit most of the oyster areas on the Atlantic Coast. Compared with February 1961, processed fresh fish and shellfish prices this February were up 13.1 percent. This increase was the result of an increase (34.3 percent) in the price of fresh haddock fillets at Boston and an increase (20.1 percent) in fresh shrimp price at New York City. Both fresh haddock fillets and fresh shrimp were scarce this February.

Prices for processed frozen fish and shellfish in February 1962 were 2.1 percent higher than the previous month



principally because of higher prices for frozen ocean perch fillets (up 3.0 percent) and frozen shrimp at Chicago (up 3.3 percent). Compared to the same month last year, February 1962 prices were up a substantial 16.1 percent. The continued scarcity of frozen shrimp was responsible for the 35.1-percent increase in the Chicago price for frozen shrimp. Lighter supplies of frozen ocean perch fillets caused the price at Boston to rise 11.5 percent. Offsetting these increases were lower prices (down 8.3 percent) for frozen flounder fillets at Boston.

The short supplies of canned fishery products were reflected in higher prices. The index for the canned fishery products subgroup started to rise again (up 1.4 percent) in February 1962, with canned pink salmon prices up 1.8 percent, canned California sardine in tomato sauce prices up 2.0 percent, and canned Maine sardine prices up 4.1 percent. The 1961/62 season for California sardines ended on February 28 with the pack behind the small pack in 1960. Maine sardine stocks continued to dwindle and demand exceeded the available supplies. Canned pink salmon stocks also were at a low level. Canned tuna stocks were moderate and demand was good, but there was no significant change in prices except that some trade discounts were reported in advertised brands. February 1962 prices for canned fishery products were up a substantial 11.7 percent. All products (except for canned salmon) in the subgroup were priced substantially higher this February: canned Maine sardine prices were up 50.6 percent, canned California sardine prices were up 34.7 percent, and canned tuna prices were 10.4 percent higher.



SHRIMP IN UNITED STATES FIRST CANNED IN 1867

"Shrimp were first packed in the Gulf of Mexico area. G. W. Dunbar of New Orleans canned shrimp as early as 1867 but had difficulty with blackening and discoloration. He solved this problem in 1875 with the invention of a can lining which aided greatly in overcoming blackening. Shrimp packing soon became the principal fishery canning industry of the Gulf Coast."

--Principles and Methods in the Canning of Fishery Products,
Research Report No. 7, p. 4,
U. S. Fish and Wildlife Service

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 11-- A GREAT LAKES STERN-RAMP TRAWLER:

Gill-net vessels have long been the mainstay of the Great Lakes fishing fleet. The characteristic and unique superstructures of the vessels have been designed to protect their low decks from boarding seas and their crews from bad weather. Early in 1958, owners began converting some of the gill-net vessels to otter trawlers (Gordon and Brouillard 1961). Conversion required removal of much of the protective superstructure from each vessel to make way for the mast, boom, and overhead tackle used in conventional otter trawling operations. Some owners were disturbed at the exposure of decks and crews that resulted.

A method of trawling was needed that could be adapted readily and relatively inexpensively and that would permit operations from gill-net vessels without removing from them the existing superstructures or decking. One such method, suitable for use with many gill-net vessels, has been found in stern-ramp trawling.

In stern-ramp trawling, the net is hauled over a hydraulic stern ramp through an opening in the stern and wound on a drum. No overhead gear is needed, and there is no necessity for removing the superstructure.

EQUIPMENT AND GEAR

A relatively simple deck arrangement has been developed for gear handling (fig. 1). Deck equipment consists of winch, net drum, net roller, and stern ramp. The winch is mounted amidships, aft of the pilothouse, with its drums facing wing bollards mounted in each bulwark. Trawling warps lead from the drums, through the wing bollards, aft along each side, through towing blocks attached to davits on each stern quarter, and outboard to the trawl doors. Warp ends remain shackled to the trawl doors throughout the net-handling operation.

The net drum, similar in design and construction to those used aboard some Pacific

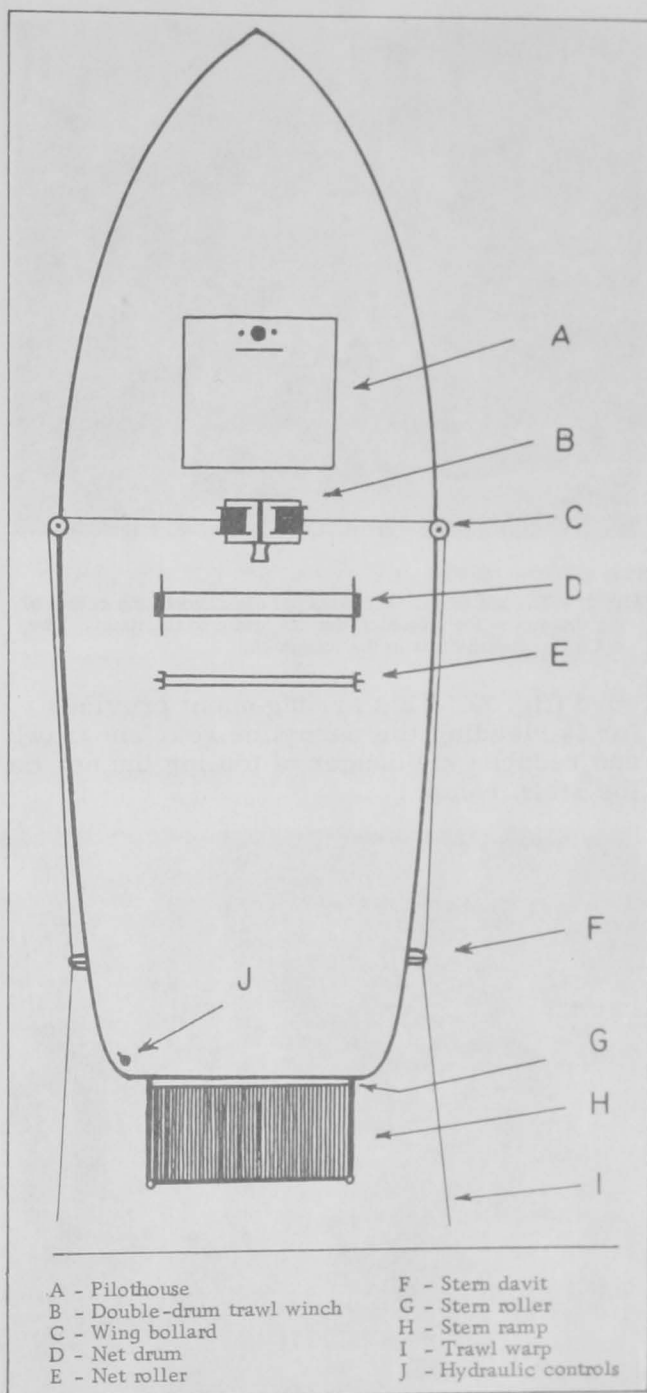


Fig. 1 - Topside view of deck arrangement of a stern-ramp trawler.

Northwest trawl vessels (Alverson 1959, Wathne 1959), is mounted just aft of the winch. The net bridle is attached to the drum by pennants mounted in the center of the drum

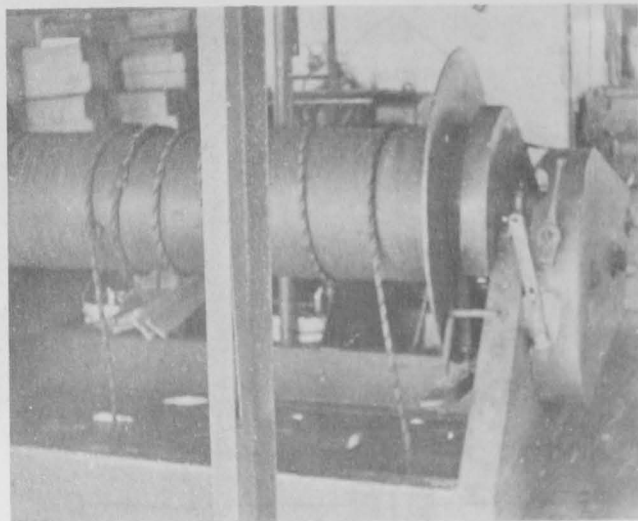


Fig. 2 - The net drum. Pennants are attached to the center of the drum core for attaching the net bridle to the drum. The net roller stanchion is in the foreground.

core (fig. 2). This arrangement provides for fairleading the dandyline gear and trawl and reduces the danger of fouling the net on the stern ramp.

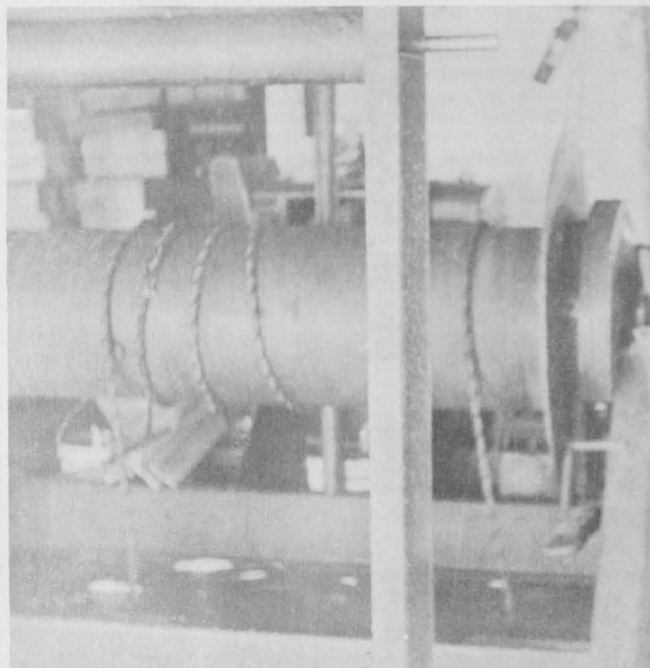


Fig. 3 - The net roller in a raised position. As the cod end of the net passes over the raised roller, the catch is spilled on deck.

The net roller (fig. 3) is used to spill the catch in the limited confines of the enclosed vessel, thereby taking the place of the conventional mast, boom, and overhead tackle.

The roller is installed in channel-iron stanchions directly aft of the winch. Slides and bearing slots cut into the sides of the stanchions (fig. 3) allow manual adjustment of roller height. The roller is lowered during setting and raised to empty the cod end.

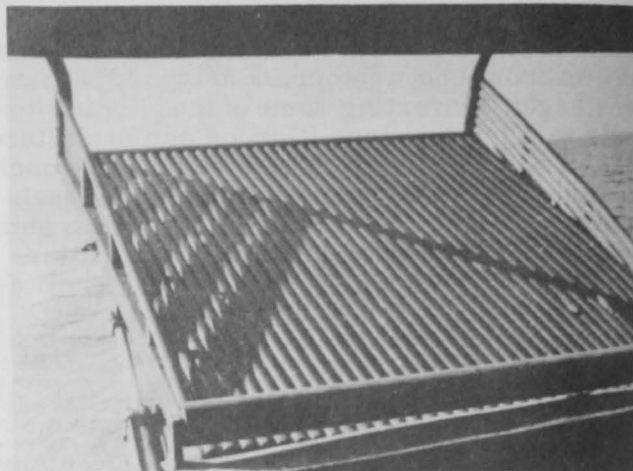


Fig. 4 - The stern ramp. Two double-acting hydraulic rams are used to raise and lower the ramp. The roller in the foreground is mounted on top of the stern bulwarks to aid in setting and hauling the net.

The stern ramp (fig. 4) is hinged to the hull directly below the stern opening, outside the bulwarks. Ramp construction is of channel iron, sheet iron, half-round flat stock, and pipe. Two double-acting hydraulic rams are used to raise and lower the ramp. Hydraulic controls for the rams are mounted under the bulwarks near the stern (fig. 5). A 4-inch pipe roller, mounted on the stern rail just above the ramp, reduces friction and gear wear during setting and hauling.



Fig. 5 - Controls for the hydraulic stern ramp rams are located near the stern bulwarks.

Winch and net drums are powered by a mechanical drive. The hydraulic rams are powered by a positive-displacement, belt-driven pump attached to the auxillary engine.

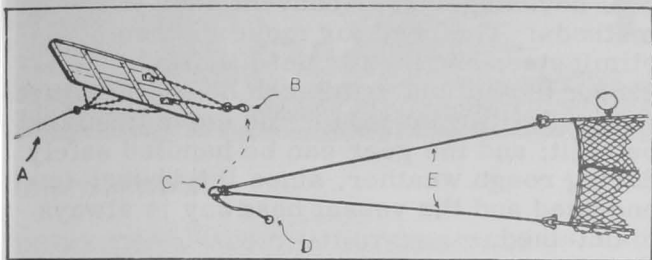


Fig. 6 - The dandyline hookup and arrangement of door connections and warp. (A) Trawling warp (B) Safety hook (C) Bridle ring (D) Pennant idler (E) Legs of dandyline bridle.

Trawl gear used in stern-ramp trawling is the same as that commonly used in the Great Lakes trawl fishery, except that the conventional dandyline hookup described by Knake (1958) has been modified somewhat. The usual 10- to 15-fathom bridles are used between doors and net, but the bridles are connected to the doors with simple chain backstraps that end in heavy-duty safety hooks (fig. 6) rather than with the usual Kelly eyes, stopper links, and shackles.

HANDLING THE GEAR

Setting the Net: (1) The stern ramp is lowered to the water, and the trawl drum is released. (2) The net unwinds from the drum and passes outboard over the ramp (fig. 7). (3) The bridles follow the net off the drum, but they are held by the drum pennants. (4) Safety hooks attached to the chainbackstraps on the trawl doors are attached to the bridles; the pennants are slacked off; and the strain of the bridles is shifted to the doors. (5) The pennants are then unhooked, and the rest of the set is completed following standard otter trawling procedure. (6) When the desired amount of warp is out, the stern ramp is raised from the water to reduce drag.

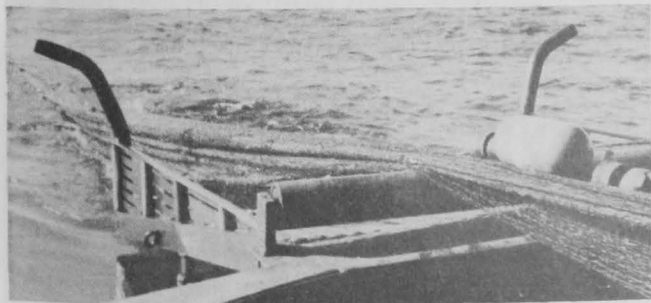


Fig. 7 - Setting the net. The stern ramp has been lowered to the surface of the water.

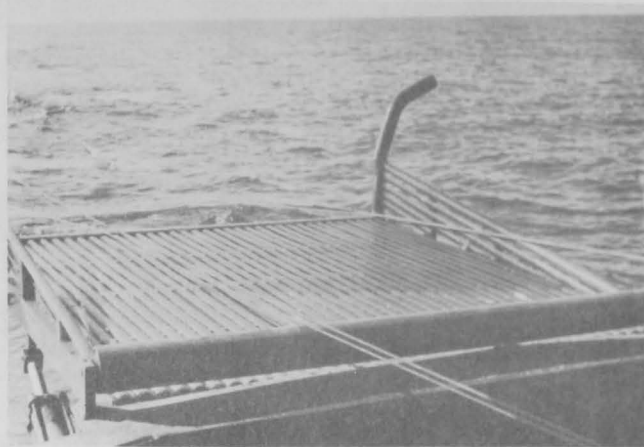


Fig. 8 - Hauling the gear. The bridle and net are easily led to the net drum.

Hauling the Net: (1) The trawl doors are hauled back to the towing blocks; winch drums are locked; and the stern ramp is lowered to the water (fig. 8). (2) The drum pennants are reattached to the bridles and are wound in on the drum until the strain of the bridles is off the doors. (3) The safety hooks are removed from the bridle rings, and the bridles are wound on the drum. (4) As the net follows the bridle onto the drum (fig. 9), the ramp is

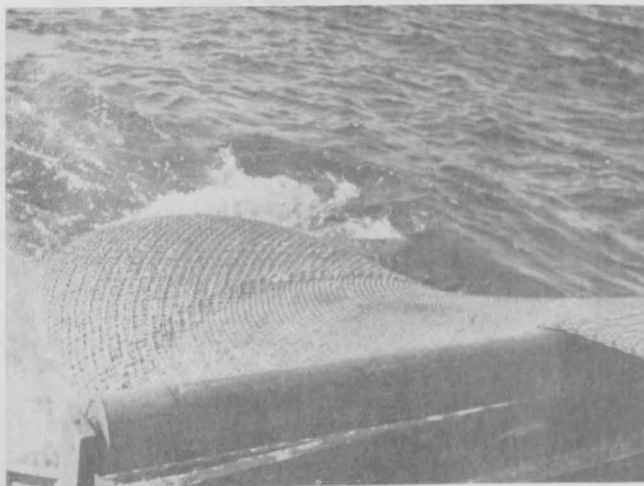


Fig. 9 - The cod end of the net positioned over the ramp prior to being brought aboard.

lowered further until its after end is several feet under the water. (5) When the intermediate section and cod end of the net are directly over the ramp the drum is stopped, and the ramp is raised until it slopes above deck level. (6) The net drum is started again, and the catch in the cod end is hauled aboard (figs. 10, 11). (7) When the intermediate section of the net is over the net roller, the drum is stopped once more, the cod end is

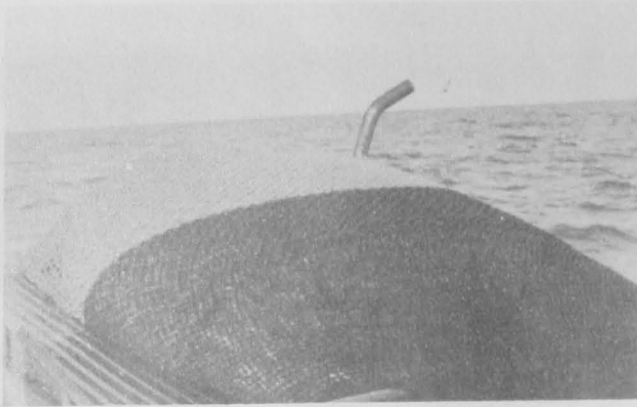


Fig. 10 - The stern ramp is raised so that it slopes above deck level and the catch, in the cod end, is brought aboard.

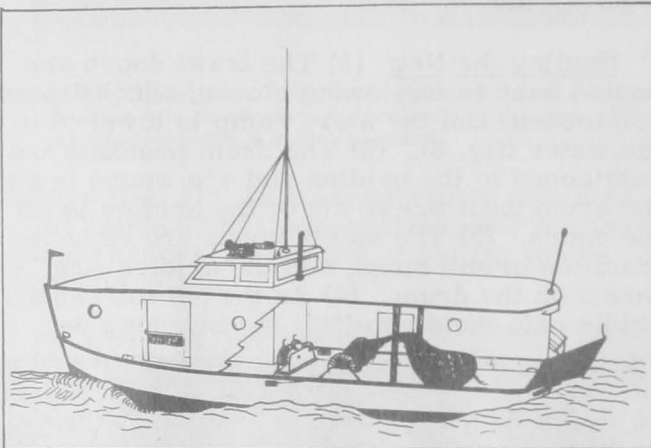


Fig. 11 - Cutaway view of the after deck of a stern ramp trawler showing arrangement of the deck equipment. The net roller is in its raised position.

opened, and the net roller is raised to a height of about 5 feet. (8) Further turns of the drum draw the cod end over the roller, raising it, and spilling the catch on deck.

ADVANTAGES OF STERN-RAMP TRAWLING

Great Lakes stern-ramp trawling has several advantages over conventional trawling methods: The need for mast and boom is eliminated; rigging for net handling is reduced; the net and catch can be handled rapidly with little labor, for the catch need not be split; and the gear can be handled safely during rough weather, since the vessel is enclosed and the vessel headway is always maintained.

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Note: Appreciation is extended to Capt. William Kunesh of the stern-ramp trawler *Avis J.* for providing the opportunity to photograph and observe stern-ramp trawling procedures.

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