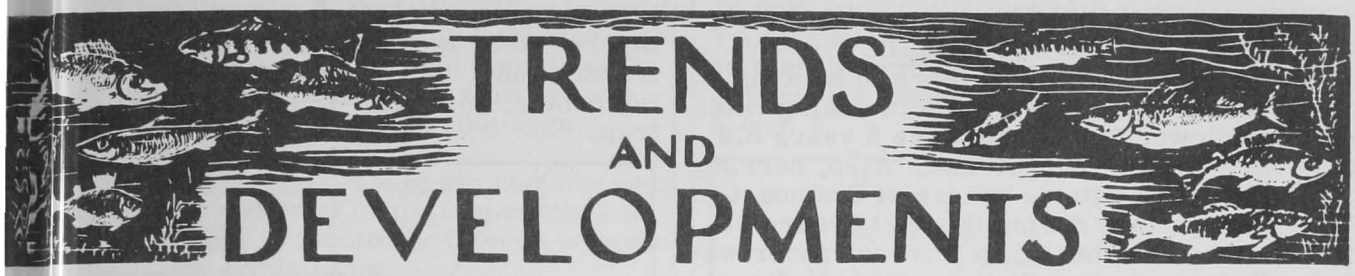

Alaska

PINK SALMON WORKSHOP MEETS IN JUNEAU:

A one-week Pink Salmon Workshop was held at Juneau, Alaska, this past January. More than 75 management and research biologists attended the workshop meetings to discuss the present status and future needs of pink salmon research on the west coast of North America. Agencies represented were the Alaska Department of Fish and Game, Canadian Department of Fisheries, Washington Department of Fisheries, Fisheries Research Board of Canada (Nanaimo), Fisheries Research Institute, and the Bureau's Auke Lake and Montlake Laboratories.

Prediction of the magnitude of pink salmon runs was emphatically stressed by management biologists as their most important research requirement with the need to determine optimum escapement levels a close second. Research biologists reported on progress in the problems of migrations, optimum spawning escapement, and discovery of mortality factors in stream, estuary, and ocean environments. The status of natural and artificial spawning channel studies was also discussed. The smoltlike development of pink fry in the estuary and coastal marine waters was an interesting concept discussed by Nanaimo and Auke Bay biologists, suggesting further avenues of study towards solving problems of pink salmon growth and abundance. It was concurred that a breakthrough is imminent in marine research.

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FOREIGN FISHING ACTIVITY IN BERING SEA:

The Soviet fleets fishing in the eastern Bering Sea continued to build up during January, while Japanese fishing activities remained at a low level.

More than 150 Soviet trawlers and associated support vessels were believed to be fishing in the Bering Sea. Major emphasis was reported to be on herring and, to a lesser degree, flatfish and rockfish.

The Japanese shrimp factoryship Chichibu Maru and her accompanying trawlers returned to Japan in late December 1963. In January two stern trawlers of the Akebono Maru type were reported fishing in the eastern Bering Sea within the Area 3B North Triangle regulatory zone.

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ALASKA FISHERY LANDINGS, 1963:

Dungeness crab and king crab landings were at a record level in 1963 in Alaska. However, 1963 landings of all other important fishery products were down from 1962, according to preliminary statistics.

Alaska Commercial Fishery Landings, 1/ 1963 with Comparisons

Species	1/1963	1962	Percentage Change From 1962
	. . (1,000 Lbs.) . . .		
Sablefish	1,100	1,400	-21
Salmon:			
King	8,000	8,700	- 9
Chum	33,000	57,700	-43
Pink	120,000	143,300	-16
Red	34,000	52,900	-36
Coho	13,000	15,200	-14
Total	208,000	277,800	-25
Herring	31,000	33,900	- 9
Clams	400	700	-43
Crabs:			
Dungeness . .	11,800	9,000	+31
King	77,000	52,800	+46
Shrimp	14,400	16,900	-15

1/Preliminary.

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BAIT HERRING FISHING AT KETCHIKAN:

The annual harvest of bait herring at Ketchikan was under way during January, with deliveries made to three cold-storage plants. Those landings were principally from Ward Cove, a traditional herring fishing ground near Ketchikan. By the end of January three vessels had landed more than 1.5 million pounds of herring. Fishing was expected to continue through February to provide bait for king crab and halibut fishermen during the 1964 fishing season.

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HERRING GROWTH AND MORTALITY RATES ANALYZED:

Analyses of the past 30 years of herring statistics show that apparently mortality rates are much lower for fish that are 8 years old and over than for younger fish. Also, herring caught from the outside waters of Southeast Alaska weigh less during the early years of maturity than do fish taken from the inner waters. Frequency distributions of sizes for different age groups show a persistent bimodality for both inner and outer herring strongly suggesting different groups or stocks within each population. Tests of the data from thousands of samples are under way to determine the extent and significance of the differences in mortality and weights.

California

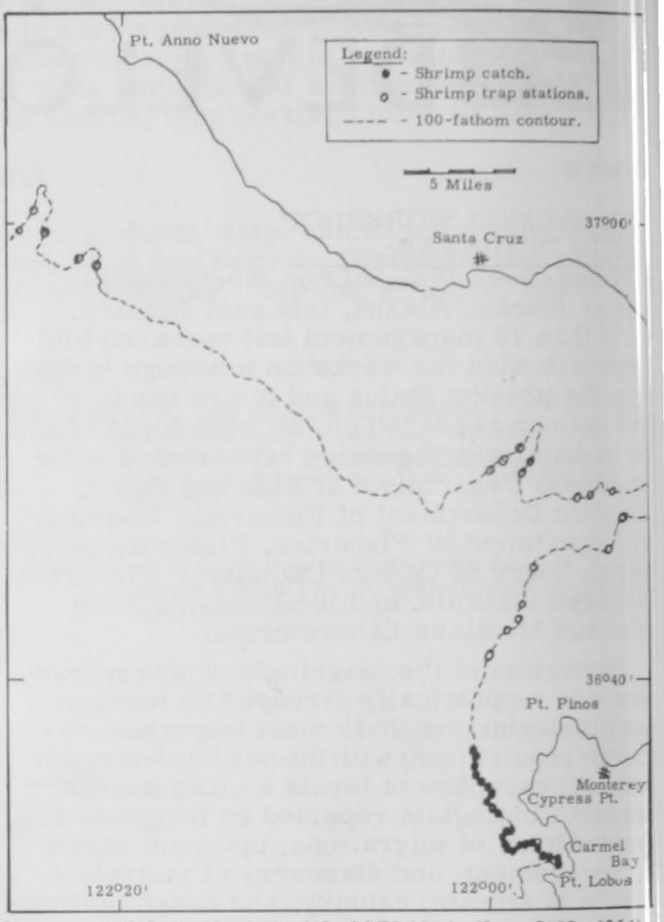
SHRIMP RESOURCES OFF CALIFORNIA COAST SURVEYED:

M/V "Alaska" Cruise 64-A-1-Prawn (January 8-30, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska off the California coast between Pt. Anno Nuevo and Purissima Point were to: (1) conduct exploratory fishing for spotted shrimp (Pandalus platyceros), (2) determine size, sex, and weight of shrimp from different areas, and (3) make bathythermograph casts to obtain bottom temperatures at trap stations.

A total of 75 shrimp trap sets were made from Pt. Anno Nuevo to Anacapa Island (45 sets were with cylindrical traps and 30 with rectangular traps). A set consisted of 6 to 8 traps attached by 1-fathom gangions at 10-fathom intervals along the mainline. Nearly all sets were at right angles to contours of submarine canyons in depths of 70 to 115 fathoms.

Traps were paid out in a straight line as the vessel moved from deep to shallow soundings over the canyon slope. After the last trap was shot, 120 fathoms of free line was laid out toward shore. One hundred pounds of anchor chain was then attached to the line and marked with a buoy.

The cylindrical traps used were 42 inches long and 22 inches in diameter, and rectangular traps 15 by 15 by 30 inches. All were made of $\frac{3}{8}$-inch reinforced steel rod covered with $1\frac{1}{2}$-inch nylon mesh. Mesh entrance tunnels were tapered to $3\frac{1}{4}$ inches. Each trap had an entrance tunnel extending from each end toward the center, about one-third the length of the trap.



Shows part of Cruise 64-A-1 of the M/V Alaska (Jan. 8-30, 1964).

The only areas producing shrimp in appreciable numbers were off Cypress Pt. and Carmel Bay. In all, a total of 2,533 shrimp weighing 317 pounds were caught. Highest catch rates were 2.8 pounds-per-trap for a set of 8 cylindrical traps, and 2.6 pounds-per-trap for a set of 7 rectangular traps.

Average shrimp catches in rectangular and cylindrical traps were:

Average Shrimp Catches during Cruise 64-A-1

Type of Trap	Pounds	Number of Shrimp	Heads-on Shrimp Count Per Pound
	. . (Per Trap) . .		
Rectangular	1.3	9.3	7.2
Cylindrical	1.8	14.9	8.3
Total	1.6	13.2	8.2

The heads-on count of shrimp caught ranged from 6.3 to 13.2 per pound. Mean carapace lengths for males, transitionals, and females

re 37.7, 42.0, and 47.5 millimeters (about 1.7, 2.1 inches), respectively. Of those, 25 rcent were males, 12 percent transitionals d 63 percent females. More than 98 per- nt of the females were carrying eggs.

Five trap sets made along the canyons near Anno Nuevo yielded negligible catches as 15 sets made in Monterey Canyon between Pinnos and Santa Cruz.

From Pt. Sur to Lopez Pt., 15 sets were de with little success. One trap near Part- on Pt. yielded 2 pounds but the area as a ole was unproductive. Ten sets made from Piedras Blancas to Purissima Pt. yielded y 3 shrimp.

At Anacapa Island only the deepest of 5 p sets caught shrimp just 2.5 pounds.

Only one bathythermograph cast was made ring the cruise because of a winch break- wn. The cast was made off Pt. Lobos and e temperature was 8.9° C. (48° F.) at 120 thoms. Surface temperature was 12.1° C. 3.8° F.).

Incidental fish catches were light, mostly blefish (Anoplopoma fimbria) and filamented ulpins (Icelinus filamentosus). Other fish cluded juvenile rockfishes, cuskeels, brotu- s, flatfish, and hagfish. Invertebrates con- sted mostly of octopi, hermit crabs, nudi- anchs, starfish, sea urchins, and crabs.

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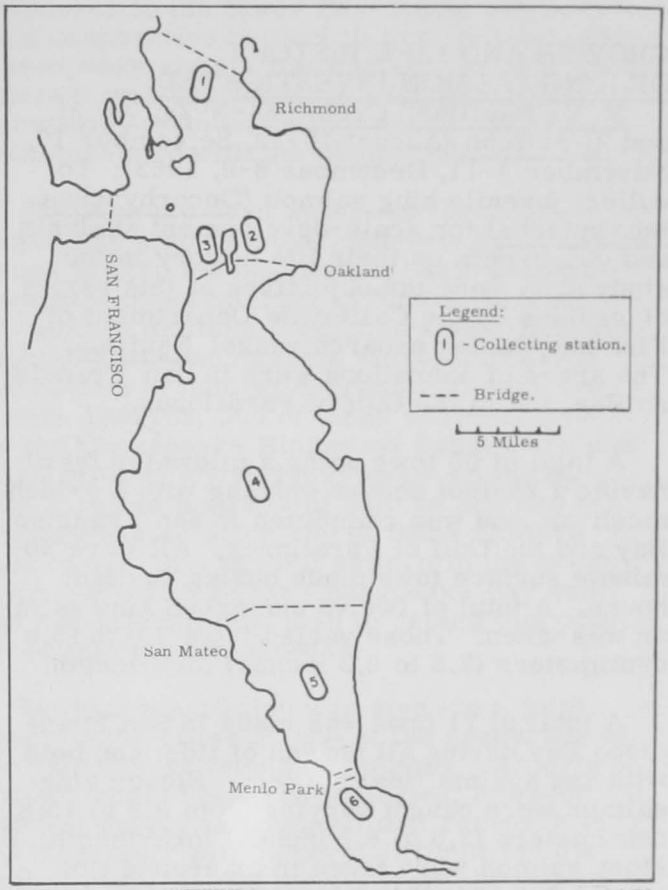
N FRANCISCO BAY
VESTIGATIONS CONTINUED:

M/V "Nautilus" Cruise 63-N3i-k S. F. Bay udy (Fourth Quarter 1963): The monthly dy of San Francisco Bay south of San Pablo y by the California Department of Fish and me research vessel Nautilus was continued ring the fourth quarter of 1963. Short cruises re made during October, November, and cember to: (1) collect fish and inverte- ates routinely at six stations to determine stribution and relative abundance under pre- iling environmental conditions, (2) define ological zones of the bay, and (3) determine e food of the principal fish and its availability.

At each station, a square-mouthed mid- ater trawl 25 feet on a side was towed for 20 inutes or more at the surface. Each of the stations was also sampled by a 15- to 20- inute bottom tow with a beam-trawl net 10 feet wide and 4 feet high with 1-inch mesh. To avoid overloading the net with dead shells or mud, two 10-minute tows were made on the soft bottoms encountered at Stations 1, 4, 5, and 6.



Shows collecting stations during San Francisco Bay study by M/V Nautilus.

Two species of fish were added to the bay collection list with the capture of 4 turbots (Pleuronichthys coenosus) at Station 4, and a dwarf perch (Micrometus minimus) at Station 1. A total of 54 species of fish were taken in 1963 during the monthly sampling of San Francisco Bay which began in February. Plans call for the study to be continued through 1964. A series of samples through several seasons will be required to determine relative abundance of species from year to year.

October and November 1963 water temperatures were within the range 11.9° to 15.6° C. (53.4° to 60.1° F.) recorded on previous cruises. However, the December 1963 mean temperature of 9.4° C. (48.9° F.) was below the lowest monthly mean recorded for other months in 1963. In the deeper water, the bottom temperature was as high or higher than the surface temperature.

Salinities were between the 13.9‰ to 34.1‰ limits measured earlier in 1963.

Note: See Commercial Fisheries Review, Dec. 1963 p. 20, and Sept. 1963 p. 15.

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GROWTH AND LIFE HISTORY OF KING SALMON INVESTIGATED:

M/V "Nautilus" Cruise 63-N-2g, 2h, 2i, and 2j-Salmon (August 10-12, September 10, November 4-11, December 8-9, 1963): To collect juvenile king salmon (Oncorhynchus tshawytscha) for scale-development analysis and obtain data on their life history in the study area were the objectives of this series of cruises by the California Department of Fish and Game research vessel Nautilus. The areas of operations were in San Francisco Bay and in the Gulf of Farallones.

A total of 98 tows using a midwater trawl having a 25-foot square opening with a ½-inch mesh cod end was completed in San Franciso Bay and the Gulf of Farallones. All were 20-minute surface tows made during daylight hours. A total of twelve unmarked king salmon was taken. Those varied from 7.0 to 15.8 centimeters (2.8 to 6.2 inches) fork-length.

A total of 71 tows was made in San Francisco Bay during all phases of tide, and both with and against tidal current. Eleven king salmon were caught varying from 9.2 to 15.8 centimeters (3.6 to 6.2 inches) fork-length. Most salmon were taken in or around tide rips. But difficulty in keeping the net set in those areas made it impossible to fish them most of the time. Other species taken in the Bay were anchovy, jacksmelt, American shad, surfsmelt, herring, dogfish, soupfin shark, brown rockfish, and threadfin shad.

Twenty-seven tows were made in the Gulf of Farallones. One king salmon 7.0 centimeters (2.8 inches) fork-length was caught. Other species taken in the Gulf were herring, jacksmelt, tomcod, and sandlance.

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PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 64-1-Pelagic Fish (January 20-23, 1964): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Point Anno Nuevo to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

On January 20, the area from Point Vicente to the United States-Mexico Border was scouted, but scouting conditions were poor between Point Vicente and Dana Point. The sky was heavily overcast and the water was turbid from the previous day's storm. South of Dana Point, scouting conditions were excellent, but few fish schools were sighted. A total of 25 small schools of northern anchovies (Engraulis mordax) were off Camp Pendleton, where a large school group was observed in December 1963. California gray whales (Eschrichtius glaucus) were quite common from Camp Pendleton south.

The flight scheduled for January 21 was cancelled due to bad weather.

Point Vicente to Point Buchon was scouted on January 22. Weather conditions were variable. Good flight weather prevailed south of Jalama Park, but rain and sleet squalls were frequent to the north. One large anchovy school was sighted on the surface in a rough sea near Point Vicente. This was unusual because fish generally stay deep when such turbulence exists.

On January 23, Point Anno Nuevo to Point Dume was scouted. On that day scouting conditions were fair but intermittent cloud formations cast dark shadows on the water's surface causing many false sightings, requiring additional scouting time to verify. Two unidentified schools were seen, one each near Point Lopez and Cape San Martin, which behaved like Pacific sardines (Sardinops caeruleus) but they were too deep for positive identification. Numerous gray whales were also seen between Point Buchon and Point Sur.

Note: See Commercial Fisheries Review, March 1964 p. 10.

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SEA OTTER POPULATION SURVEY:

Airplane Spotting Flight 64-2-Special Project (January 28-29, 1964): To obtain a visual and photographic count of California sea otters (Enhydra lutris nereis), the Channel Islands and the inshore area from Santa Barbara to Pigeon Point were surveyed from the air by the California Department of Fish and Game's Beechcraft N5614D. California sea otters are thought to range from Cambria to Anno Nuevo Island.

No sea otters were observed at any of the Channel Islands on January 28, although excellent visibility prevailed at the altitudes flown (30 to 150 feet) during the census at all 7 islands.

The inshore area from Santa Barbara to a point about halfway between Anno Nuevo Island and Half Moon Bay was surveyed on January 29. Excellent visibility prevailed at the altitudes flown (generally between 100 and 150 feet, occasionally as low as 30 feet). Sea otters were observed only between Cambria and Monterey Bay. Within that area, 236 sea otters were widely scattered in and near kelp beds; the largest group contained only 15 animals. Decreasing visibility and rain were encountered a few miles north of Anno Nuevo Island and the census was concluded at that point. Photographs were taken with an aerial camera of all sizable groups of sea otters; small groups and single individuals were not photographed.

Two California gray whales were also observed.

Chesapeake Bay

RESEARCH CONFERENCE
POINTS UP PROBLEM AREAS:

A joint conference on research problems in the Chesapeake Bay and its tributaries was held at Solomons, Md., on February 7, 1964, by staffs of the marine laboratories of the Virginia Institute of Marine Science and the Natural Resources Institute, University of Maryland.

The laboratories of both Institutes have often joined forces on research projects but expressed further interest in increasing their cooperation and singled out several fields where joint efforts might be of special benefit. One of among these was the decision by the group to develop a joint research program on the blue crab, which migrates freely between Maryland and Virginia and provides a resource of significant importance to both states. Two scientists, one from each laboratory, were requested to complete detailed planning of the research necessary for effective management of the blue crab.

At the conference, considerable discussion was given to the possibility of surveying temperature conditions throughout Chesapeake Bay, since they trigger the migrations of marine animals, spawning, and many other important activities. The conferees hoped that Virginia's use of airplane to scan surface temperatures in the lower Bay can be extended as a cooperative project to include the upper Chesapeake and its tributaries. In addition, interest was expressed in adding careful observations from boats at a set of stations coincidentally with the plane flight.

Because the deep waters of the Chesapeake Bay tend to move upstream from the ocean toward the headwaters, both laboratories expressed interest in further release of "seabed drifters," which are small plastic umbrella-shaped devices which drift along the bottom of natural currents. During the winter 1962/63, 300 of these were released by the Chesapeake Biological Laboratory and most of them showed movement up the Bay. The Virginia Institute of Marine Science has been releasing about 500 of those drifters each month in a careful pattern in the ocean near the mouth of the Chesapeake Bay and the two laboratories plan to extend this program into the Chesapeake.

Serious discussion was given to a joint study of the croaker, one of the resources of the Bay now in very short supply. Reports from present research indicated, however, that the supply is so small that research in the Bay itself will be very difficult for the next few years. Biologists from the two stations agree that Maryland and Virginia both need to learn more about the croakers now present in North Carolina, since they may affect the supply in the Chesapeake. A joint project may be developed at that location. Additional studies of spot and other indigenous Bay fish species were considered and may develop at a later date.

The Potomac River was a special point of interest, since both laboratories are advisers to the Potomac River Fisheries Commission and because the river is shared by the two states. Particular emphasis was given to the need for evaluating all the present knowledge of that area and to the urgent necessity for research on the enormous amount of waste material flowing into the upper Potomac from the Washington metropolitan region. A joint study is under discussion.

The problems involved in oyster management in the Potomac River were discussed

by members of both groups who will make cooperative recommendations to the Potomac Fisheries Commission.

The directors of both Institutes commented on the high expense of research on the waters which cover about 20 percent of Maryland, a large part of Virginia and extend out to the edge of the Continental Shelf. At the present time, the Chesapeake Biological Laboratory of Maryland is without a research vessel and completely unable to participate in the extensive study necessary to answer each of the questions involved. The directors stressed that the problems of the Bay area are rapidly increasing with population growth and industrialization that must be attacked on a bay-wide basis, since fish and other organisms are highly migratory. The expense of such operations will continue to increase. (Natural Resources Institute, University of Maryland, February 10, 1964.)

Federal Aid for Sport Fish and Wildlife Restoration

FUNDS APPORTIONED TO STATES, FISCAL YEAR 1964:

A final distribution of $10.2 million in Federal Aid funds for fish and wildlife restoration during fiscal year 1964 has been made to the 50 States, Guam, Puerto Rico, and the Virgin Islands, the U.S. Department of the Interior announced on January 27, 1964. Those funds are in addition to the $12.6 million released on May 15, 1963, making a total of more than $22.8 million available for fiscal year 1964, Secretary of the Interior Stewart L. Udall said. Of the total of $22,828,172.62 released for fiscal year 1964, $16,673,076 is for wildlife restoration and $6,155,099 is for fish projects.

The Interior Secretary said funds apportioned to the States will be used for fish and wildlife restoration projects involving the purchase of land, improvement of areas of land or water for fish and wildlife, and to conduct research for the restoration and perpetuation of those resources.

Under the Federal Aid program, the States initiate the projects and, if they meet the requirements established by the Department of the Interior, the funds allocated are used to reimburse the States up to 75 percent of the cost of completed projects.

The amount allocated for fiscal year 19 under the Federal Aid in fish and wildlife r toration programs is over $3.5 million mo than the $19,170,000 apportioned in fiscal year 1963.

Apportionment for Federal Aid in Fish and Wildlife Restoratio Fiscal Year 1964

State	Fish Projects	Wildlife Restoratio
Alabama	$ 107,550.49	$ 316,230.
Alaska	306,254.95	781,394.
Arizona	117,544.90	357,468.
Arkansas	115,584.20	284,832.
California	306,254.95	774,822.
Colorado	144,835.05	375,321.
Connecticut	61,250.99	78,139.
Delaware	61,250.99	78,139.
Florida	132,179.75	248,215.
Georgia	127,672.61	291,788.
Hawaii	61,250.99	78,139.
Idaho	100,442.20	312,449.
Illinois	160,497.13	427,040.
Indiana	154,324.35	459,266.
Iowa	110,643.87	329,491.
Kansas	104,961.83	330,860.
Kentucky	82,607.26	243,061.
Louisiana	74,720.41	274,207.
Maine	64,125.89	189,676.
Maryland	61,250.99	122,599.
Massachusetts	61,250.99	91,443.
Michigan	226,865.98	638,339.
Minnesota	280,578.89	444,846.
Mississippi	83,045.53	239,424.
Missouri	167,260.20	376,868.
Montana	145,295.75	489,907.
Nebraska	92,850.58	306,285.
Nevada	89,786.38	302,022.
New Hampshire	61,250.99	78,139.
New Jersey	61,250.99	134,953.
New Mexico	111,181.00	370,205.
New York	162,646.41	544,657.
North Carolina	94,168.71	363,248.
North Dakota	61,250.99	225,908.
Ohio	171,549.98	486,768.
Oklahoma	128,637.61	301,780.
Oregon	144,196.07	428,686.
Pennsylvania	135,305.83	706,181.
Rhode Island	61,250.99	78,139.
South Carolina	70,093.49	181,259.
South Dakota	80,333.57	316,145.
Tennessee	140,630.45	365,858.
Texas	306,254.95	781,394.
Utah	90,094.52	319,246.
Vermont	61,250.99	81,858.
Virginia	85,496.52	318,114.
Washington	114,880.94	351,134.
West Virginia	61,250.99	189,261.
Wisconsin	227,491.97	461,201.
Wyoming	92,493.02	312,627.
Guam	10,000.00	10,000.
Puerto Rico	10,000.00	10,000.
Virgin Islands	10,000.00	10,000.
Totals	$6,155,099.08	$16,673,076.

Note: See Commercial Fisheries Review, July 1963 p. 36, January 1963 p. 27.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, FOURTH QUARTER 1963:

October 1963: FRESH AND FROZEN: For the use of the Armed Forces under the Depart-

...t of Defense, slightly less fresh and fro-...z fishery products were purchased in Oc-...er 1963 than in the previous month. (The ...chases were made by the Defense Subsist-...e Supply Centers.) The decline was 1.9 ...cent in quantity and 1.7 percent in value. ...ctober 1963, leading items were pur-...sed in the following quantities (average ...e in cents per pound shown in parenthe-...: shrimp 663,080 pounds (78); scallops ...100 pounds (56); oysters 101,502 pounds (...; ocean perch fillets 246,190 pounds (32); ...nder fillets 225,000 pounds (27); and had-...k fillets 182,800 pounds (35). The October ...chases also included substantial quantities ...alibut, cod fillets, and mackerel.

...le 1 - Fresh and Frozen Fishery Products Purchased by Defense ...bsistence Supply Centers, October 1963 with Comparisons

QUANTITY				VALUE			
...ctober		Jan.-Oct.		October		Jan.-Oct.	
...3	1962	1963	1962	1963	1962	1963	1962
... (1,000 Lbs.) ...				... ($1,000) ...			
...47	2,149	19,490	20,083	975	1,585	10,917	12,560

CANNED: Large purchases of canned ...mon for the Armed Forces were made in ...tober 1963. Previous purchases of canned ...mon in 1963 had been very light and total

Table 2 - Canned Fishery Products Purchased by Defense ...bsistence Supply Centers, October 1963 with Comparisons

...uct	QUANTITY				VALUE			
	October		Jan.-Oct.		October		Jan.-Oct.	
	1963	1962	1963	1962	1963	1962	1963	1962
	... (1,000 Lbs.) ...				... ($1,000) ...			
...a	281	138	2,992	3,846	123	69	1,420	2,131
...on	1,448	2,265	1,478	3,281	875	1,150	895	1,788
...ine	24	20	399	85	8	8	158	39

...chases of the 3 principal canned fishery ...ducts (tuna, salmon, and sardines) in the ...st 10 months of 1963 were down 32.5 per-... in quantity and 37.5 percent in value ...m those in the same period of 1962 due to ...er purchases of canned salmon and tuna.

* * * * *

November 1963: FRESH AND FROZEN: ...rchases of fresh and frozen fishery prod-...s for the Armed Forces in November 1963 ...re considerably above those in October ...3 due mainly to larger purchases of shell-

...le 1 - Fresh and Frozen Fishery Products Purchased by Defense ...bsistence Supply Centers, November 1963 with Comparisons

QUANTITY				VALUE			
...ovember		Jan.-Nov.		November		Jan.-Nov.	
...3	1962	1963	1962	1963	1962	1963	1962
... (1,000 Lbs.) ...				... ($1,000) ...			
...32	1,893	21,722	21,976	1,206	991	12,123	13,551

fish and ocean perch fillets. In November 1963, leading items were purchased in the following quantities (average price in cents per pound in parentheses): shrimp 894,321 pounds (69); scallops 220,975 pounds (57); oysters 148,705 pounds (89); ocean perch fillets 361,510 pounds (311); haddock fillets 163,560 pounds (39); flounder fillets 136,050 pounds (27); halibut 139,047 pounds (37); cod fillets 45,731 pounds (30); sole fillets 30,890 pounds (28); and clams 35,600 pounds (29).

CANNED: There were sizable purchases of each of the three principal canned fishery products in November 1963.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, November 1963 with Comparisons

Product	QUANTITY				VALUE			
	November		Jan.-Nov.		November		Jan.-Nov.	
	1963	1962	1963	1962	1963	1962	1963	1962
	... (1,000 Lbs.) ...				... ($1,000) ...			
Tuna	1,011	1,013	4,003	4,859	416	433	1,836	2,564
Salmon	732	11	2,210	3,292	433	8	1,328	1,796
Sardine	59	9	458	94	22	3	180	42

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December 1963: FRESH AND FROZEN: Shrimp, scallops, and groundfish fillets continued to account for a large part of purchases of fresh and frozen fishery products for the Armed Forces in the final month of 1963. In December 1963, leading items were purchased in the following quantities (average price in cents per pound in parentheses): shrimp 518,997 pounds (74); scallops 227,775 pounds (57); oysters 83,520 pounds (99); ocean perch fillets 246,662 pounds (31); flounder fillets 206,244 pounds (29); haddock fillets 73,610 pounds (40); cod fillets 71,638 pounds (30); sole fillets 40,790 pounds (27); salmon 67,226 pounds (64); and halibut 75,680 pounds (38).

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, December 1963 with Comparisons

QUANTITY				VALUE			
December		Jan.-Dec.		December		Jan.-Dec.	
1963	1962	1963	1962	1963	1962	1963	1962
... (1,000 Lbs.) ...				... ($1,000) ...			
1,678	1,380	23,400	23,356	894	837	13,017	14,388

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, December 1963 with Comparisons

Product	QUANTITY				VALUE			
	December		Jan.-Dec.		December		Jan.-Dec.	
	1963	1962	1963	1962	1963	1962	1963	1962
	... (1,000 Lbs.) ...				... ($1,000) ...			
Tuna	364	748	4,367	5,607	154	379	1,990	2,943
Salmon	1	3	2,211	3,295	1	2	1,329	1,798
Sardine	31	28	489	122	13	12	193	54

CANNED: In December 1963, purchases of canned tuna and canned salmon continued to lag behind those in the previous year.

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January-December 1963 Summary: FRESH AND FROZEN: Total purchases of fresh and frozen fishery products for the use of the Armed Forces in 1963 were almost the same as those in 1962 and 1961. The value of the fresh and frozen purchases in 1963 was down 9.5 percent from 1962, but up 4.3 percent from 1961. The average price per pound of fresh and frozen purchases in 1963 was 55.6 cents compared with 61.6 cents in 1962 and 53.2 cents in 1961.

In mid-1963, frozen shrimp prices began to decline from the high levels established in 1962. The average price of frozen western halibut also declined in 1963. On the other hand, prices for frozen scallops, ocean perch fillets, and haddock fillets were generally higher in 1963 than in previous year.

CANNED: Total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) in 1963 were down 21.7 percent in quantity and 26.7 percent in value from those in 1962. The value fell more than the quantity because of generally declining prices for the principal canned fishery products in 1963. The total 1963 canned purchases were also down 18.0 percent in quantity and 17.7 percent in value from those in 1961.

With the recovery of the Maine sardine industry in 1962, purchases of canned sardines showed a sharp increase in 1963, but this could not offset declining purchases of the volume items (canned tuna and canned salmon). Purchases of canned tuna in 1963 were down 22.1 percent from 1962 and 38.3 percent from 1961. Purchases of canned salmon in 1963 showed a drop of 32.9 percent from 1962, but a gain of 57.6 percent over 1961.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, March 1964 p. 16, May 1963 p. 26.

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VETERANS ADMINISTRATION ESTIMATED REQUIREMENTS FOR CANNED FISH FROM 1964 PACKS:

Early this year, the Veterans Administration announced its estimated requirements for various canned fish products from 1964 packs as follows:

Veterans Administration Requirements for Canned Fish from 1964 Packs

Canned Product	Can Size	Quantity (Doz. Cans
Salmon, med. red or coho, skin and backbone on	4 lb.	3,000
Salmon, red or sockeye	No. 1	10,692
Salmon, red or sockeye	4 lb.	1,800
Salmon, red or sockeye, dietetic	No. 1/2	9,300
Sardines	No. 1	4,500
Tuna, light meat, chunk, in vegetable oil	4 lb.	7,500
Tuna, dietetic	No. 1/2	11,000

Filleting Machine

YELLOW PERCH FILLETING MACHINE NOW IN OPERATION IN GREAT LAKES REGION:

The United States manufacturers of a yellow perch filleting machine have announced that they now have a prototype machine in operation at Sheboygan, Wis. The filleting machine processed about 50,000 pounds of round yellow perch during the first month's operation.

After being headed and scaled, the fish are fed into the machine at a rate of about 1,000 pounds an hour. The machine produces approximately 500 pounds of fillets from that amount of headed and scaled fish. Less than 5 percent of the fillets produced require additional hand trimming. The fillet yield is about $2\frac{1}{2}$ percent less than that of a hand-filleting operation. The cost of the machine is reported to be $8,500 net, f.o.b. factory (Gladstone, Mich.).

Fish Meal

PLANT BEING BUILT IN GREAT LAKES REGION:

A fish-meal processing plant is being built at Milwaukee, Wis., at a reported cost of $250,000. It is the first major development of this type in the Great Lakes area and when completed this spring will process low-value fish (principally alewives) caught in the Great Lakes into fish meal for use in poultry and livestock feeds. The Milwaukee firm building the plant is a distributor of fresh fish and processes its less marketable catch for use

by t food producers and mink ranchers. The firm has 2 of the 7 trawlers now operating out of western Lake Michigan ports. (Great Lakes News Letter, November-December 1963.)

Great Lakes

LAKE TROUT HATCHERY AND PLANTING PROGRAM:

More than 2.3 million young lake trout were planted in Lake Superior during 1963, according to the Great Lakes Fishery Commission. Yearling trout planted by participating Federal, state, and Canadian provincial agencies totaled about 1,974,000 and fingerlings accounted for an additional 350,000. The previous high for this restocking program was set in 1962 when 1,853,000 yearling and fingerling lake trout were planted in Lake Superior.

A survey in mid-1963 of young lake trout being reared in state, Federal, and Canadian provincial hatcheries indicated that about 2.7 million yearlings will be available for planting in Lake Superior during the spring of 1964. The new Jordan River Federal fish hatchery, under construction in the northern section of Michigan's lower peninsula, is expected to increase sharply the hatchery stock of lake trout. Construction of that hatchery was sufficiently advanced in the fall of 1963 so that it could be used at that time to provide yearlings for planting in early 1965. With the Jordan River hatchery in operation, about 5 to 7 million yearling lake trout will be available annually for the Great Lakes rehabilitation program. (Great Lakes News Letter, September-October 1963.)

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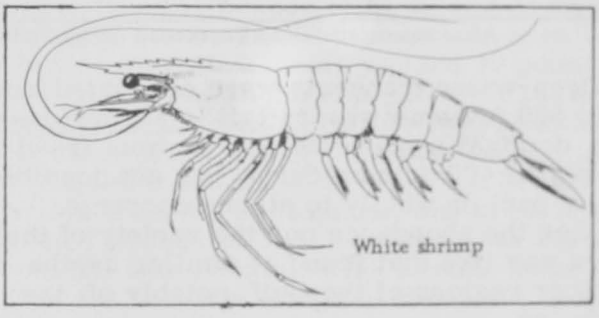
CONTRACT FOR WATER RESEARCH IN LAKE MICHIGAN AWARDED BY PUBLIC HEALTH SERVICE:

A $1 million contract for research on Lake Michigan has been awarded to the University of Michigan by the U. S. Public Health Service. A principal aim of the four-year study is to determine the effects of man's uses of the lake and how fast his use is changing water quality. Another major purpose is to investigate the Lake's effect on weather. The research will be carried out by the University's Great Lakes Research Division and will be principally in the section of the Lake south of Milwaukee and Muskegon. The Division's three research ships will be involved in extensive sampling of the Lake for chemical and biological analysis of the water and bottom sediments. The project is designed to provide information needed for planning future management of the Lake and preservation of its water quality. (Great Lakes News Letter, September-October 1963.)

Gulf Exploratory Fishery Program

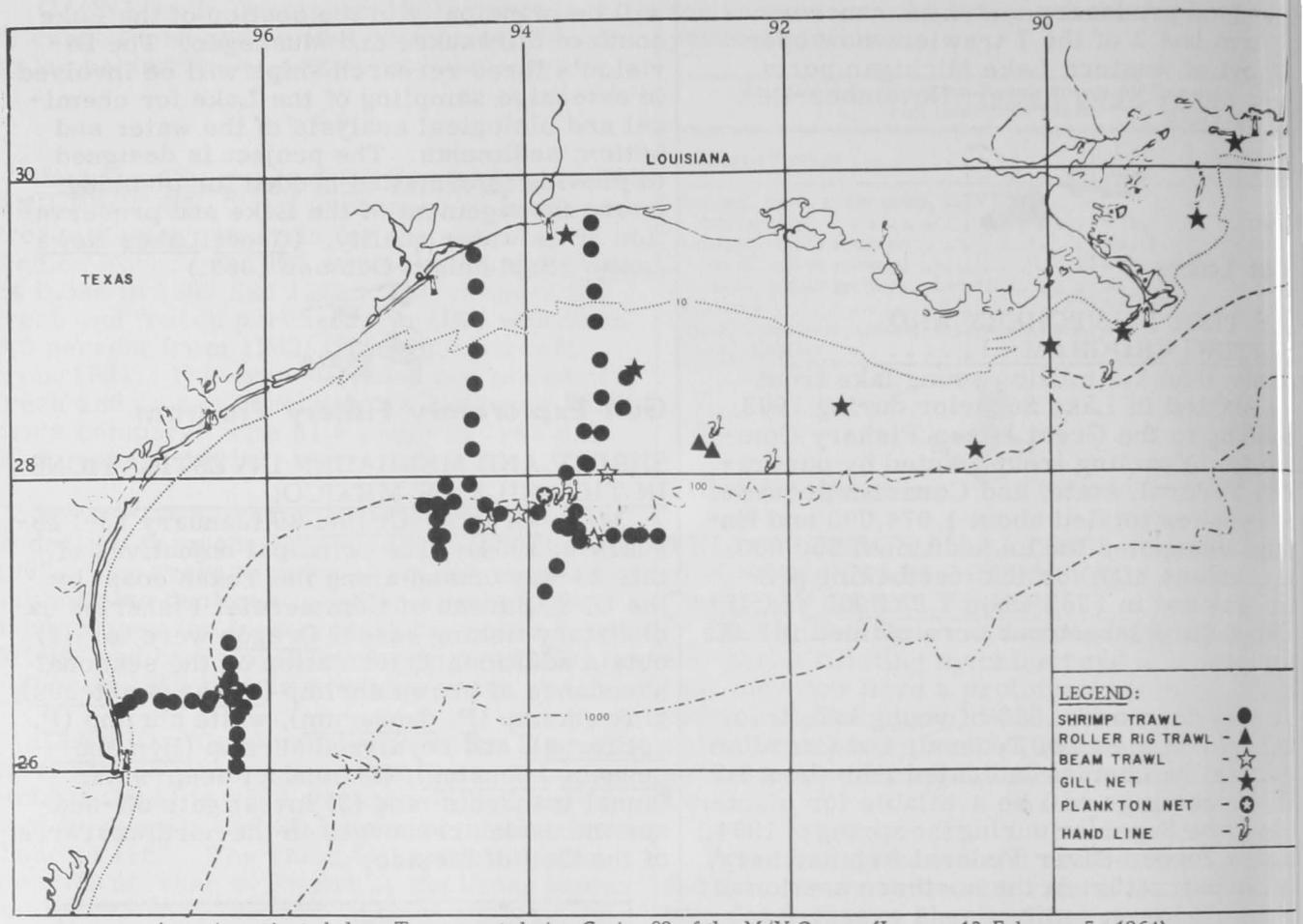
SHRIMP AND MENHADEN INVESTIGATIONS IN THE GULF OF MEXICO:

M/V "Oregon" Cruise 89 (January 13-February 5, 1964): The principal objectives of this 24-day cruise along the Texas coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to: (1) obtain additional information on the seasonal abundance of brown shrimp (Penaeus aztecus), pink shrimp (P. duorarum), white shrimp (P. setiferus), and royal-red shrimp (Hymenopenaeus robustus); (2) conduct deep-water faunal transects; and (3) investigate off-season menhaden resources in the northwest area of the Gulf of Mexico.


White shrimp

Catches of inshore shrimp on this cruise were light with 30 drags in depths of 4 to 50 fathoms yielding 86 pounds of brown shrimp, $7\frac{1}{2}$ pounds of pinks, and $35\frac{1}{2}$ pounds of whites. Brown shrimp were predominant from depths of 17 to 32 fathoms, pinks at 12 fathoms, and whites at 9 fathoms.

Royal-red shrimp were also caught in light quantities at depths from 200 to 300 fathoms where the bottom temperature ranged between 46.1° and 51.3° F. A total of 30 drags yielded 87 pounds of that species with the largest catch consisting of 12 pounds taken in 240 fathoms off Brownsville, Texas.



Areas investigated along Texas coast during Cruise 89 of the M/V Oregon (January 13-February 5, 1964).

Deep-water transects were conducted from 50 to 500 fathoms with rattail (Macrouridae) fish dominating the catches. Bottom trawling on the 400-fathom curve was not possible due in part or wholly to strong currents. Neither the abundance nor the variety of the fauna was like that found at similar depths in other regions of the Gulf, notably off the Tortugas.

Investigations on the off-season menhaden abundance were continued with 16 gill-net stations being occupied. Those stations were equally divided between bottom and surface sets in 5- to 50-fathom depths. Gill nets used were of No. 7 monofilament nylon, constructed of five 300-foot sections of $2\frac{1}{2}$-, $2\frac{5}{8}$, $2\frac{3}{4}$-, $2\frac{7}{8}$-, and 3-inch stretch mesh. About 89 adult large-scale menhaden (Brevoortia patronus) were caught in surface nets. Fifty-two of those fish were caught in 20 fathoms in spawning condition.

The newly acquired West Coast-type gill-net hauler greatly facilitated the handling of exceedingly long monofilament nets.

In addition to gill-net catches, 125 juven menhaden were taken in a 65-foot shrimp trawl that was fished in 5 fathoms of water.

Note: See Commercial Fisheries Review, February 1964 p. 2

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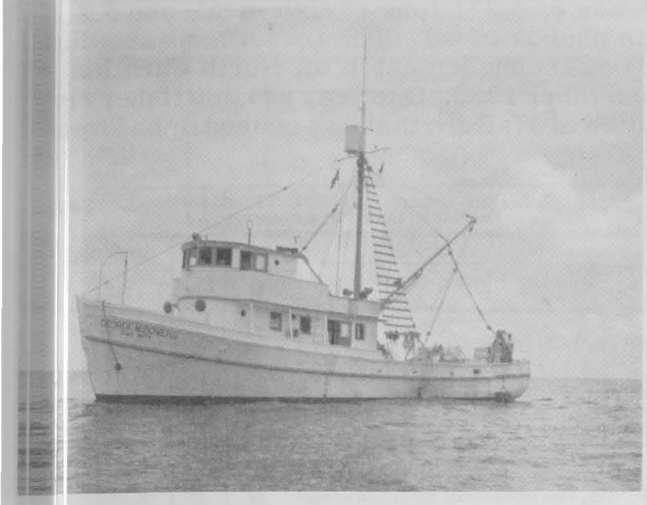
SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 49 (Jan ary 22-February 12, 1964): To evaluate th effectiveness of the electrical shrimp trawl in daylight fishing on the Key West-Tortug shrimp grounds was the purpose of this cru by the U. S. Bureau of Commercial Fisheri exploratory fishing vessel George M. Bowe Results were similar to those obtained on t Apalachicola offshore grounds during the ve sel's previous cruise (Cruise 48, November 6-27, 1963). As estimated from night trawl ing with standard gear, catches during day-light hours ranged from 20 to 60 percent of what was available.

In an attempt to increase the daytime cat a number of factors were investigated. The included pulse width, pulse power, pulse re



U. S. Bureau of Commercial Fisheries exploratory fishing vessel, George M. Bowers.

tion rate, and electrode length (pulses per shrimp). With the exception of pulse width, increase in the value of those parameters did not markedly affect the catch. An improvement resulted when the pulse width was increased from about 10 microseconds to 100 microseconds. Further lengthening of the pulse, however, did not affect the catch rate.

The daylight electric trawl catch was typical since it was composed of large shrimp only (26-30 count), whereas night catches contained large shrimp as well as smaller sizes not caught during the day.

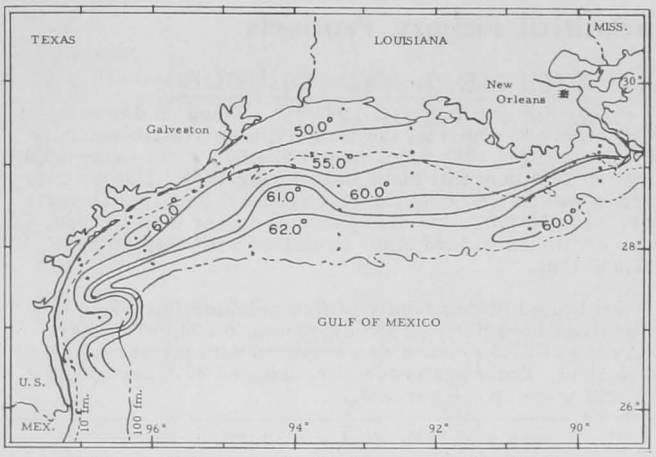
Indications were that burrowed shrimp were responding to the electrical field but all were not clearing the bottom. To examine this possibility, laboratory experiments using the cohesive Tortugas mud were to be conducted.

See Commercial Fisheries Review, February 1964 p. 22.

Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-13 (January 18-30, 1964): Shrimp investigations in the Gulf of Mexico were expanded to include the collection of additional oceanographic data during this cruise of the chartered research vessel Gus III. The vessel is operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Galveston, Tex. As part of the enlarged study, a total of 53 bathythermograph casts, 20 Nansen bottle casts, 26 plankton tows, 16 paired plankton tows, and 21 plankton sled tows were made. Successful plankton sled tows were made at 200 fathoms.



M/V Gus III Cruise GUS-13 (January 18-30, 1964).

During shrimp sampling at established stations, catches were generally light with only a few isolated hauls yielding fair results. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) off Louisiana and Texas were covered. Thirty-two 3-hour tows with a 45-foot flat trawl were made.

Area 14 produced the largest catch which consisted of 41 pounds of 51-67 count white shrimp from under 10 fathoms. In area 18, a tow in over 20 fathoms yielded 37 pounds of 12-15 count brown shrimp. In area 16, a catch of 12 pounds of 26-30 count brown shrimp was taken from the 10-20 fathom depth. Area 17 yielded 9 pounds of 26-30 count brown shrimp from 10-20 fathoms, and area 13 produced 7 pounds of 31-40 count brown shrimp from the same depth. Pink shrimp were found in traces in a few tows, but the quantity in each case was less than one pound.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Feb. 1964 p. 27.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY 1964:

Skipjack tuna landings in Hawaii in January 1964 were about 475,000 pounds. This was 176,000 pounds above the 1948-1963 average for the month. During January there were 80 productive trips giving an average of 4,473 pounds per trip. Individual catches ranged from

147 pounds to 13,685 pounds. Oahu-based vessels landed 94 percent of the total catch.

Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, 1962-63: Based on domestic production and imports, the United States available supply of fish meal for 1963 amounted to 624,003 short tons--60,464 tons (or 10.7 percent) more than during 1962. Domestic production was 69,586 tons (or 22.4 percent) less, but imports were 130,050 tons (or 51.5 percent) higher than in 1962. Peru continued to lead other countries with shipments of 291,544 tons.

The United States supply of fish solubles (including homogenized fish) during 1963 amounted to 102,997 tons--a decrease of 21.2 percent as compared with the same period in 1962. Domestic production dropped 22.6 percent, but imports were up 7.4 percent.

U. S. Supply of Fish Meal and Solubles, 1962-63

Item	1/1963	1962
	..(Short Tons)..	
Fish Meal and Scrap:		
Domestic production:		
Menhaden	179,971	238,680
Tuna and mackerel	21,626	26,559
Herring	7,425	5,095
Other	32,624	40,898
Total production	241,646	311,232
Imports:		
Canada	50,925	42,806
Peru	291,544	186,249
Chile	23,533	9,247
So. Africa Republic	12,296	10,084
Other countries	4,059	3,921
Total imports	382,357	252,307
Available fish meal supply	624,003	563,539
Fish Solubles:		
Domestic production 2/	96,224	124,334
Imports:		
Canada	2,034	1,335
Iceland	55	2,332
So. Africa Republic	411	1,717
Other countries	4,273	924
Total imports	6,773	6,308
Available fish solubles supply	102,997	130,642

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

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

Production, December 1963: During December 1963, a total of 7,954 tons of fish meal and scrap and over 6 million pounds of oil was produced in the United States. Compared with December 1962, this was an increase of 5,271 tons of fish meal, and 5.4 million pounds of oil. The increases were due to a good menhaden catch off North Carolina in December 1963. One year ago this fishery resulted in a failure that was caused by bad weather.

U. S. Production of Fish Meal, Oil, and Solubles, December 1963 1/ with Comparisons

Product	December		Jan.-Dec.	
	1/1963	1962	1/1963	1962
	..... (Short Tons)			
Fish Meal and Scrap:				
Herring	2/	25	7,425	5,095
Menhaden 3/	6,067	308	179,971	238,680
Sardine, Pacific	1	-	27	702
Tuna and mackerel	1,356	1,649	21,626	26,559
Unclassified	530	701	20,597	27,377
Total	7,954	2,683	229,646	298,413
Shellfish, marine-animal meal and scrap	4/	4/	12,000	12,819
Grand total meal and scrap	4/	4/	241,646	311,232
Fish Solubles:				
Menhaden	2,224	125	73,970	84,885
Other	526	1,581	15,030	28,353
Total	2,750	1,706	89,000	113,238
Homogenized condensed fish	-	132	7,224	11,096
	.... (1,000 Pounds)			
Oil, body:				
Herring	2/	170	5,726	5,255
Menhaden 3/	5,342	69	165,037	237,815
Sardine, Pacific	-	-	4	166
Tuna and mackerel	379	343	5,654	5,175
Other (including whale)	362	97	7,588	7,397
Total oil	6,083	679	184,009	255,808

1/Preliminary data.
2/Included with unclassified.
3/Includes a small quantity of thread herring.
4/Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

The quantity of fish solubles manufactured in December 1963 amounted to 2,750 tons or 61 percent more than in December 1962. Menhaden solubles accounted for 81 percent of the total solubles manufactured.

The 1963 production of fish meal amounted to 241,646 tons. This was a decrease of 69,586 tons or 22 percent compared with 1962. Menhaden meal decreased 58,709 tons or 25 percent. The oil yield for 1963 amounted to 184 million pounds, a decrease of 72 million pounds or 28 percent as compared with 1962. Production of fish solubles and homogenized condensed fish decreased 28,110 tons or 23 percent in 1963.

* * * * *

Production by Areas, January 1964: Preliminary data on U. S. production of fish meal, oil, and solubles for January 1964 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, January 1964 (Preliminary) with Comparisons

	Meal	Oil	Solubles	Homogenized[3]
	Short Tons	1,000 Pounds	(Short Tons)	
January 1964:				
Gulf Coasts	799	160	74	-
West Coast[2]	1,688	236	1,166	-
Total	2,487	396	1,240	-
January 1963 Total	2,285	424	1,391	50

1/ Does not include crab meal, shrimp meal, and liver oils.
2/ Includes American Samoa and Puerto Rico.
3/ Includes condensed fish.
NOTE: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

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Major Indicators for U. S. Supply, January 1964 and December 1963: United States production of fish meal in January 1964 was higher by 8.8 percent as compared with January 1963. Production of fish solubles and fish oil was down by 13.9 and 6.6 percent, respectively.

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

Item and Period	1/1964	1/1963	1962	1961	1960
			(Short Tons)		
Fish Meal:					
Production:					
January	2/2,487	2/2,285	2,941	2,723	3,828
February	2/	2/2,847	3,616	2,071	3,116
Jan.-Dec.	2/	2/229,646	298,413	291,337	270,343
Year 3/	2/	2/241,646	311,232	311,265	290,137
Imports:					
January	-	18,495	25,427	9,531	8,571
February	-	40,086	18,819	14,344	8,081
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 4/:					
Production:					
January	1,240	1,441	1,808	1,620	1,697
February	-	1,223	1,726	1,650	1,812
Year	-	96,224	124,334	112,241	98,929
Imports:					
January	-	148	273	219	214
February	-	169	2,249	155	1,875
Year	-	6,773	6,308	6,739	3,174
Fish Oils:			(1,000 Lbs.)		
Production:					
January	396	424	763	489	534
February	-	324	408	366	554
Year	-	184,009	255,808	266,668	215,653
Exports:					
January	-	79	509	13,449	2,068
February	-	2,458	21,647	17,456	23,828
Year	-	262,342	123,050	122,486	143,659

1/ Preliminary.
2/ Preliminary data for 1963 and 1964 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent; and fish oils, 95 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/ Includes homogenized fish.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oils, December 1963

Item and Period	1/1963	1962	1961	1960	1959
			(Short Tons)		
Fish Meal:					
Production:					
January	2,285	2,941	2,723	3,828	3,095
December	2/8,391	2,683	12,763	9,178	15,378
Jan.-Nov.	2/221,056	295,730	278,574	261,165	266,866
Year 3/	-	311,232	311,265	290,137	306,551
Imports:					
January	18,495	25,427	9,531	8,571	19,700
December	-	18,977	23,268	15,564	5,508
Jan.-Nov.	352,628	233,330	194,577	115,997	127,417
Year	-	252,307	217,845	131,561	132,925
Fish Solubles 4/:					
Production:					
January	1,441	1,808	1,620	1,697	1,913
December	2/3,257	1,838	4,936	2,897	5,429
Jan.-Nov.	2/94,398	122,496	107,305	96,032	159,930
Year	-	124,334	112,241	98,929	165,359
Imports:					
January	148	273	219	214	1,567
December	-	387	472	60	420
Jan.-Nov.	3,613	5,921	6,267	3,114	26,210
Year	-	6,308	6,739	3,174	26,630
Fish Oils:			(1,000 Lbs.)		
Production:					
January	424	763	489	534	497
December	2/5,732	679	11,562	7,981	14,094
Jan.-Nov.	2/177,972	255,129	255,106	207,672	179,230
Year	-	255,808	266,668	215,653	193,324
Exports:					
January	79	509	13,449	2,068	6,735
December	-	172	10,484	15,807	19,586
Jan.-Nov.	229,080	122,878	112,002	127,852	124,895
Year	-	123,050	122,486	143,659	144,481

1/ Preliminary
2/ Preliminary data for 1963 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent; and fish oil, 95 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/ Includes homogenized fish.

Marketing

EDIBLE FISHERY PRODUCTS PROSPECTS IN 1964:

The outlook for supplies of edible fishery products in 1964 is expected to be little changed from previous years. The total United States catch may again decline, but more fishery products are expected to be imported. Major items for which import increases are expected include ocean perch and cod fillets, shrimp, tuna, scallops, and spiny lobster tails.

Frozen stocks of fish and shellfish on hand as 1964 began were larger than a year earlier. Canned fish stocks were down, with the exception of pink salmon and shrimp, due to smaller 1963 packs. A substantial increase in the 1963 domestic shrimp landings combined with a continuing high level of imports have resulted in

an unusually large carryover in shrimp stocks (frozen and canned). Large inventories of frozen Great Lakes chubs, fish sticks and fish portions, flounder, halibut and ocean perch fillets and steaks, crab meat, scallops, shrimp (both frozen and canned), and canned pink salmon were on hand as 1964 began.

Supplies of most major species were adequate for the early 1964 Lenten season and during the remainder of the year. Increased United States imports are expected to offset a small decline in the total domestic fishery landings anticipated for 1964.

Retail prices of some major fishery products will most likely strengthen during the year. Fresh and frozen shrimp and canned tuna prices, in particular, may firm up. Little change is expected in the United States per capita consumption of all fishery products in 1964.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's January 1964 issue of the National Food Situation (NFS-107).

National Fisheries Center

TRAINED DOLPHINS WILL BE FEATURED:

When the National Fisheries Center and Aquarium opens in Washington, D. C., some time about 1967, it will feature a collection of unusually active aquatic animals. To help accustom them to their new habitat and make them carry out their natural activities more frequently, the Fisheries Center has engaged Keller Breland, a nationally-known animal behaviorist and psychologist, announced the U. S. Department of the Interior on February 2, 1964.

More than 7,000 animals have been trained by Breland and his wife since 1950, most of them at their farm in Hot Springs, Ark. Both have doctors degrees in psychology and have trained more than 40 different species of animals. Breland's training of dolphins and other aquatic animals at the National Fisheries Center will have the basic purposes of making the Center more useful as a scientific and educational facility, and at the same time, obtain results that will be of high interest to spectators.

Planners for the Fisheries Center are trying to prepare the nearest thing to natural habitats for the marine mammals and fish. An aquatic animal is inhibited by captivity, and research scientists at the Center will wish to study its natural behavior. Breland's work at the National Fisheries Center will be a departure from his usual training of aquatic animals. At the Marine Studios in Florida and the Marineland of the Pacific in California he trained dolphins to seize a baton or jump through a hoop. At the Fisheries Center the leap of the dolphin will be more natural, without the frills of a public show. The trainer will not be trying to create a circus. Instead, he will be trying to make the dolphin behave naturally in a near-natural habitat for the benefit of both scientists and public viewers.

What the trainer will get in the beginning is a newly-captured dolphin, a creature that fears its new surroundings and has never eaten a thawed-out frozen fish. He will flip the dead fish in the water to make it appear alive, and gradually the dolphin will come closer to his food. Eventually it will grab the fish and make a panicked retreat. If the dolphin happens to grab one of the trainers fingers, it will let loose. The dolphin has up to 100 spiked teeth, but it seldom leaves a tooth mark on a human. The dolphin's fear will begin to subside as it learns to take the fish more slowly. Then it will learn to wait for a pat on the head before it can take the fish. A pat on the head and a scratch on the stomach will follow and within a month, the dolphin will allow itself to be picked up by the trainer before it gets the fish.

The trainer's technique is based on a reward for the desired response. When an animal does something wrong, the incorrect action is ignored. Punishment and fear are never used in training. After the dolphin learns to eat dead fish, a feeder will be installed in its raceway. The dolphin will be taught that every time he hears a certain signal, he can go to the feeder and find that a fish has been released. Next a photocell will be installed on the sides of the raceway, just above the surface of the water. The dolphin's natural curiosity soon will cause him to stick his head out of the water at the right place. When he does, the photocell beam will be broken and the signal will sound. The dolphin will dive to the feeder box. Now the photocell beam will be gradually raised to higher elevations. The dolphin has to leap higher and higher to break the beam and may leap as high as 15 feet to get his reward. A further refinement

is background signal--a light or supersonic to-to let the dolphin know when the feeder circuit is in operation. He will learn that without this signal, there is no point in jumping. In that way, his leaps will be confined to periods when they are desired.

Dolphins at the National Fisheries Center will be taught to broadjump, an accomplishment never fefore seen in public. The dolphin will learn to leap, then travel up to 25 feet in a horizontal line to break two photocell beams. Another first achievement in public demonstration will be the dolphin's ability to use sonar to find food and avoid obstacles in murky water. Study of this capability will have important scientific benefits. The dolphin will be blindfolded by placing small rubber cups over his eyes. He will send out high-frequency signals and use the bounced-back signals to find a designated target. As he scans for the hidden object, the audience will be able to watch his underwater search. Spectators also will see the dolphin's high frequency signals registered on an oscilloscope. And sound transducers will lower the frequencies to an audible range so the signals can be heard as pings. The dolphin will "home-in" on the target, touch it with his nose and dart to the feeder box for reward.

The dolphin's natural sonar is much more efficient than the similar manmade device, according to Breland, who said that researchers would like to duplicate the original sonar of the dolphin. They also are interested in the ease with which he moves through water, creating only a minimum of turbulence and drag. More than streamline design and smooth skin are involved. As the dolphin moves through the water, his skin ripples, smoothing the turbulence and reducing it. Finally, there will be attempts to train the dolphin in the use of his audible "voice." These sounds come from his blowhole, and while the source is not known, Breland said they are not the sounds of breathing. It is already possible to teach the dolphin to make whining and "raspberry" sounds for controlled periods of time, but the trainer now wants to increase the range of sounds and shape them into patterns that resemble such human words as "thank you." "This won't mean that the dolphin will be speaking the human language," Breland said, "but it will show the vast degree to which he can learn different patterns of behavior."

The National Fisheries Center will be operated by Interior Department's Bureau of Sport Fisheries and Wildlife. The Bureau will provide research laboratories at the Center for its own scientists, for those of other Federal Government agencies, and for scientists of other countries. Planning for the Center has reached the point where design criteria soon will be turned over to the architects. Congress has authorized the $10 million research and educational facility with the proviso that construction and operating costs be repaid to the Federal Treasury. This will be accomplished by charging admission, except to student groups. As a result, the Center will impose no costs on taxpayers.

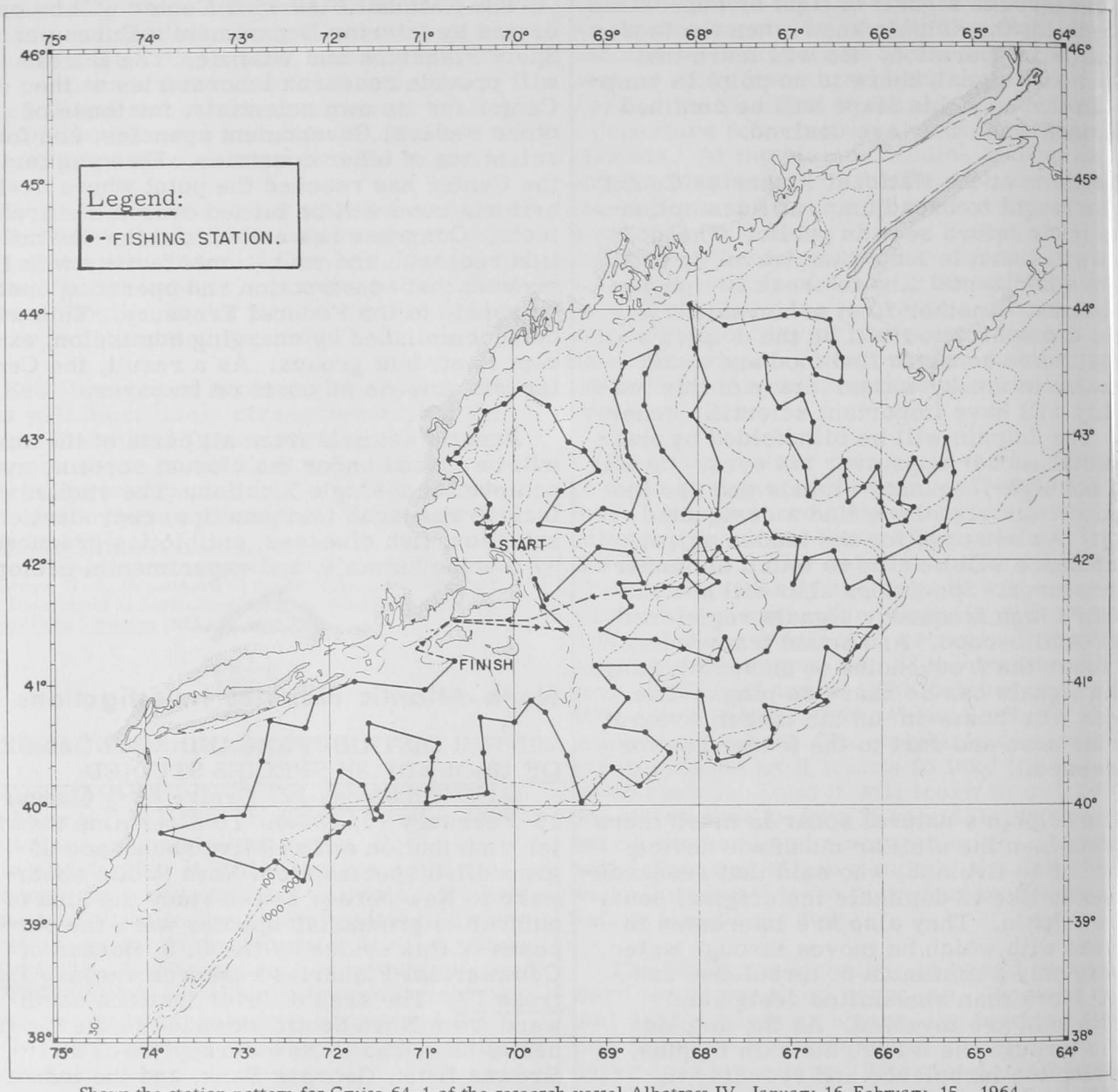
Aquatic animals from all parts of the world will be placed under the closest scrutiny ever achieved in a single location. The studies will include research into genetics, reproduction, nutrition, fish diseases, antibiotics produced by marine animals, and experimental ecology.

North Atlantic Fisheries Investigations

WINTER DISTRIBUTION AND ABUNDANCE OF GROUNDFISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 64-1 (January 16-February 15, 1964): To determine the winter distribution and relative abundance of groundfish species from Nova Scotia southward to New Jersey and to study the food of a number of groundfish species were the purposes of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The area of investigations southward from Nova Scotia extended to the Continental Shelf and to New Jersey, including Browns Bank, Georges Bank, and the inshore waters along the coast.

A total of 194 groundfish survey stations were completed on this cruise and all fish captured were identified and measured. The stomach contents of 3,159 fish of 40 species were examined and recorded in the study area. Scale samples were taken from 1,280 haddock and 473 yellowtail flounder. Otoliths were extracted from 195 silver hake and 136 cod at selected stations. A sample of sea herring was collected and frozen for the Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Me. Invertebrates taken by the trawl at each station were preserved for further identification.



Shows the station pattern for Cruise 64-1 of the research vessel Albatross IV, January 16-February 15, 1964.

In the northern part (Gulf of Maine), whiting (silver hake) were caught mainly in the deep water from 50 to 140 fathoms, while in the southern part (south of Georges Bank) whiting were taken in slightly shoaler water from 50-100 fathoms. Spiny dogfish were also caught in the deep water in the north but were abundant in the shoal water in the south. Scup were noticeably absent from all catches throughout the sampling area. Squid were generally absent in the northern part but abundant on the southern New England groun Haddock were abundant north of Cape Cod pecially on Georges Bank and on Browns B with a few specimens taken south of Cape C Pollock were taken north of Cape Cod with few specimens caught on the southern New England grounds.

The distributions of many of the specie related to depth and temperature were to b determined at a later date.

th Pacific Exploratory

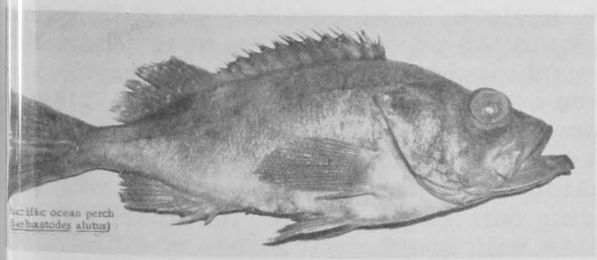
ery Program

VEY OF DEEP-WATER MARINE FAUNA
MOUTH OF COLUMBIA
R CONTINUED:

/V "John N. Cobb" Cruise 63 (January
, 1964): To monitor deep-water marine
a at stations off the mouth of the Colum-
River was the primary objective of this
ay cruise by the U. S. Bureau of Com-
cial Fisheries exploratory vessel John
obb. It was the 13th survey cruise on
ooperative study of demersal fauna off
Columbia River conducted by the U. S.
au of Commercial Fisheries and the
mic Energy Commission. The John N.
b has made 4 cruises on this study and 9
ses were made by the chartered vessel
mando.

Stormy weather greatly hampered fishing
rations during this cruise and only 5 of
17 stations established along the track-
were monitored. All of those stations
e at depths of 200 fathoms or less. An
tern otter trawl with a $1\frac{1}{2}$-inch liner in
cod end was used to sample the fauna.

English sole (Parophrys vetulus), rex sole
yptocephalus zachirus), and skates (Raja
) dominated the catch at the 50-fathom
ion. Green-striped rockfish (Sebastodes
gatus) was the most abundant species at
75-fathom station. A total of 400 pounds
ablefish (Anoplopoma frimbria) and tur-
(Atheresthes stomias) were caught in a
-hour tow at 200 fathoms. The largest
h of ocean perch (Sebastodes alutus) for
tal of 350 pounds was also taken at 200
oms. Like past winter cruises Dover
(Microstomus pacificus) and hake (Mer-
ius productus) were virtually absent from
catches in all the tows.



Pacific ocean perch (Sebastodes alutus)

Bottom temperatures and salinity samples
e taken at all stations sampled with the
wl. Samples of the fauna collected for the
mic Energy Commission were delivered
he Laboratory of Radiation Biology, Uni-
sity of Washington, Seattle, Wash.

A biologist from the Fish Commission of Oregon was aboard the vessel during the cruise to tag Dover sole and sablefish for migratory information.

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

Oceanography

DEEP-DIVING SUBMARINE FOR WOODS HOLE OCEANOGRAPHIC INSTITUTION:

The Alvin, a 22-foot research submarine designed to dive 6,000 feet into the ocean, is scheduled for delivery in the spring of 1964 to the Woods Hole (Mass.) Oceanographic Institution. Design specifications of the vessel are: weight, 11 tons; maximum speed, 6 knots; and endurance at a speed of 2.5 knots, 10 hours. The 2-man craft was financed by a $575,000 grant from the U. S. Office of Naval Research as part of its Deep Research Vehicle Program.

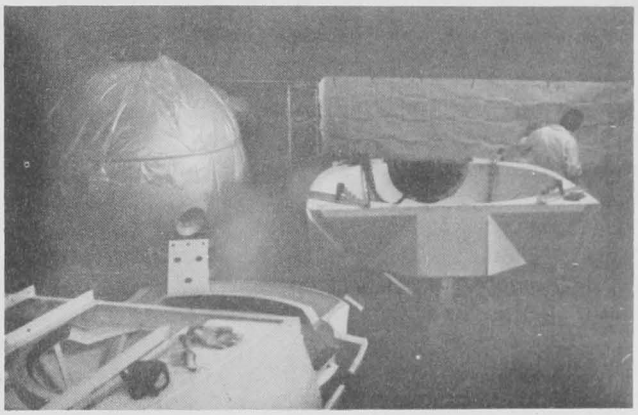


Fig. 1 - Lower section and sphere of the Alvin.

Purpose: The Alvin has been designed as a sophisticated tool for marine investigations. It will not be possible to state what work the Alvin will accomplish until thorough tests are completed; however, scientists believe the vessel will have multiple uses.

In the study of biology, a deep-diving vehicle would make it possible for scientists to observe marine life in its natural habitat. Observations of the concentrations and behavior of marine populations at great depth, not now possible except with cameras, could be made directly by scientists or recorded with manually-operated cameras. This would include observations of bottom populations, as well as the "scattering layer" of marine life which rises toward the surface at night and descends at daylight.

In the study of geology, a craft of this type would enable scientists to observe the topography and composition of the bottom (within the craft's range) more comprehensively than is now possible with camera and television equipment. Interesting samples could be collected as they are sighted, whereas now relatively hit-or-miss systems of dredging are used.

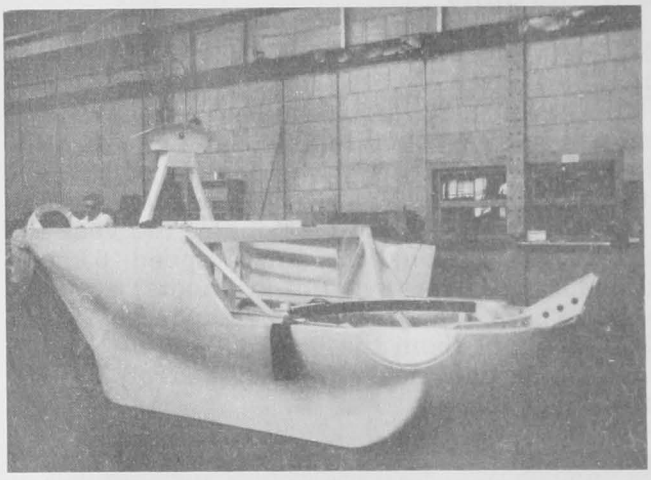


Fig. 2 - The Alvin's lower section with a fibreglass hull.

In the study of physical oceanography, a deep-diving vehicle might be able to measure speed and direction of currents by trimming to neutral buoyancy and logging its own course. By drifting slowly downward through a water column the Alvin could obtain excellent continuous profiles of temperature, salinity, and other water characteristics.

The scientific uses of such a craft would not be limited to those described above, which are mentioned only as examples of the types of work which might be accomplished.

The maximum operating depth called for in the design of the Alvin is 6,000 feet. This depth capability would open to exploration about one-sixth of the ocean bottom and about one-half of the water volume of the oceans and neighboring seas, including the continental shelves, part of the continental and island slopes, and many sea mounts. The upper 6,000-foot marine layer includes much of the life of the oceans as well as the region where variables such as currents, temperatures, and sound velocities of interest to the oceanographer are most active.

Scientific Instrumentation: Five viewing ports are planned--1 looking directly forward, 1 downward, 1 to each side, and 1 peephole directly upward through the hatch for use when surfacing. There is a planned provision for 1,200 pounds of scientific "payload" consisting of but not necessarily limited to the following: scanning sonar, echo-sounder, underwater telephone, lights, underwater television, mechanical arm, and a variety of cameras. Navigation equipment will include a gyrocompass, magnetic compass, speed indicator, and depth gauges.

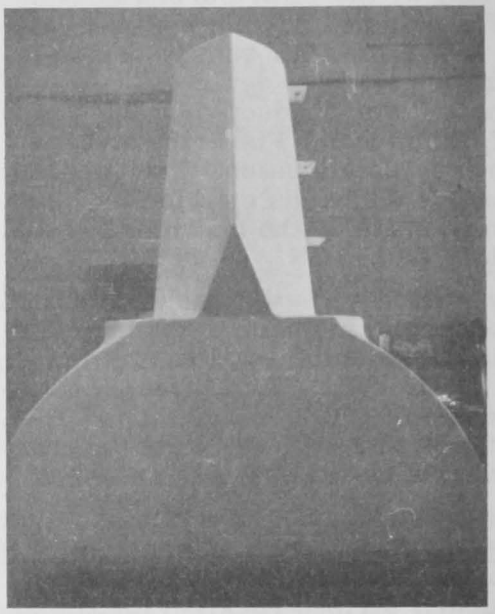


Fig. 3 - Aft view of conning tower section of Alvin.

Pressure Hull: The Alvin's pressure hull which will house the crew and much of the scientific equipment, has been fabricated from high-grade steel with an inside diameter of 79.3 inches and a shell thickness of $1\frac{1}{3}$ inches. This all-important unit is constructed from twin hemispheres welded together. Its position is forward in the vehicle and by itself is positively buoyant. The remainder of the vehicle, enclosed in an outside skin of fiberglass is open to the pressure of the sea. The fiberglass enclosure houses additional buoyancy sphere and plastic buoyancy material, plus the power supply and propulsion equipment. Whereas the pressure hull is strong enough to maintain atmospheric pressure by withstanding outside pressures, the fiberglass housing will avoid collapse by allowing inside pressure to equalize with outside pressure.

Propulsion: The Alvin will be propelled by battery-powered electric motors running in

d driving hydraulic pumps. It will have propellers for locomotion and maneuvering. The main propulsion propeller in the stern is horizontally trainable plus or minus 50 degrees (by hydraulic ram) and will serve also as a rudder. Two smaller propellers are mounted forward near the pressure hull and can be turned 360 degrees in the vertical plane to provide fore and aft or up and down thrust. Generally, ascent and descent will be controlled by flooding and exhausting ballast tanks, similar to a conventional submarine and by use of propeller thrust. In case of emergency, the buoyant pressure hull can be released from the rest of the vehicle, and, short of that, other heavy components, including the battery supply and the mechanical arm can be manually-released to provide needed lift.

Life Support System: There will be approximately 170 cubic feet of space in the pressure sphere for breathing atmosphere. A system will be provided for supplementing the oxygen supply and removing the carbon dioxide and water vapor during the period of maximum dive--24 hours.

Operations: The Alvin will be dependent upon a mothership or near-shore base for battery and air charging, life support chemicals and other necessities. It is not planned too much horizontal traveling on the surface rather the Alvin would be carried to the site of a dive by the mothership and lowered to the water. This mode of operation is one reason for Alvin's relatively small size.

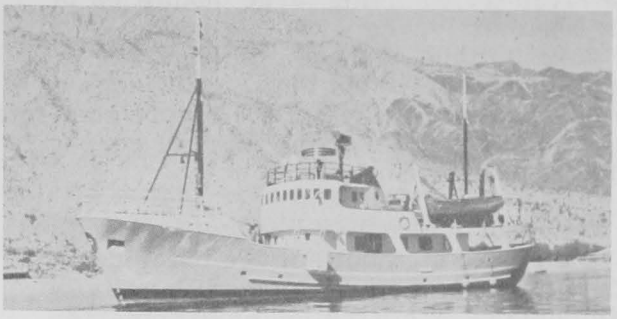
Testing Schedule: Plans call for completion of the Alvin and delivery to Woods Hole in the spring of 1964. Some preliminary testing of the vehicle will be conducted before that time, including tests of the pressure hull at the Southwest Research Institute, San Antonio, Texas. The scheduling of underwater tests will depend upon weather conditions prevailing when the Alvin is completed. (Woods Hole Oceanographic Institution, January 1964.)

See Commercial Fisheries Review, May 1963 p. 36.

* * * * *

OCEANOGRAPHIC VESSEL FOR BIOLOGICAL RESEARCH FOUNDATION:

A new 97-foot oceanographic research vessel the Neptunus Rex of the Beaudette Foundation for Biological Research at Santa Ynez, Calif., was designed and built in Norway expressly for oceanographic research. She is of a North Sea trawler design with a welded steel hull, and was launched in August 1962.



The new oceanographic research vessel, Neptunus Rex.

Specifications and other dimensions of the Neptunus Rex are: Beam: 21 feet, 6 inches; draft: 11 feet; displacement: 400 tons; tonnage: 170 gross, 112 net; propulsion: two 300-hp. Diesels; propeller: single 3-blade variable pitch; complement: crew of 7 and scientific staff of 6.

The main scientific working area of the vessel is at the forward well deck where the main winch and A-frame are located. The main winch is operated hydraulically and has interchangeable cable drums capable of using other drums with different types of cable.

Forward of the open working area, a 400-square-foot laboratory occupies the whaleback of the vessel and has both 110 and 220 volt a.c. available. Meteorological equipment includes barometer, barograph, anemometer, and psychometer. A bathythermograph winch is mounted on the after boat deck. The bathythermograph has specially designed fins permitting it to dive to a depth of 400 meters (1,312 feet) while it traces a record of the temperature and depth of the water on a graphic slide.

The vessel started on her first expedition in April 1963 when she went to Bahia de Los Angeles, Gulf of California, and made a second visit in October 1963 to the east coast of Baja, Calif. (National Oceanographic Data Center Newsletter, December 31, 1963.)

* * * * *

PUERTO RICO NUCLEAR CENTER MARINE BIOLOGY PROGRAM:

The Puerto Rico Nuclear Center of the University of Puerto Rico is conducting a marine biology program designed to measure biological productivity and the movements of

selected trace elements in the hydrosphere and biosphere of a tropical marine environment which extends seaward from the mouth of a river transporting large quantities of silt. Primarily, the work is concerned with the distributions of trace elements and is based upon the concept that a knowledge of the geochemical routes of the stable elements may be used to predict the fates of corresponding radioelements.

The investigations of productivity and trace element metabolism are being done with carrier-free or high specific activity radioisotopes in controlled environments. The trace element analyses are being done by neutron activation analysis, atomic absorption, flame spectrophotometry, and X-ray emission spectrography. The oceanographic measurements are made with standard equipment.

The geographical area of investigation includes the Afidsco River watershed (covering 200 square miles) and the adjoining marine area of the west coast of Puerto Rico extending north from Mayaquez past Punta Higuero to the mouth of the Culebrinas River and west into the Mona Pass to Desocheo Island. The area includes the reactor site at Punta Higuero.

All phases of the work were in progress in January 1964. (Puerto Rico Nuclear Center, University of Puerto Rico, College Station, Mayaquez, Puerto Rico.)

* * * * *

MARINE BIOACOUSTIC RESEARCH MAY AID COMMERCIAL FISHERIES:

Fish and other marine organisms "talk" to each other, according to a scientist who predicts that knowledge of the sounds made by them will be used to track and locate schools of commercially-valuable fish. This is the conviction of the Director of the world's largest underwater bioacoustic library at the University of Rhode Island Graduate School of Oceanography after more than 17 years of continuous research.

Noting that the U. S. Navy had already developed listening devices for tracking enemy submarines, the acoustic biologist suggested that a series of fixed, unmanned, underwater listening posts be established. Underwater sounds could then be intercepted and rebroadcast to cruising fishermen. The scientist also believes that it may be possible to attract fish by broadcasting underwater man-made sounds. Sounds that frighten some marine creatures have already been developed. They might prove beneficial in herding fish or containing them in a chosen area.

Also noting that the noises produced by underwater creatures are usually associate with "colony life," the scientist said that if one fish of a school is captured, a characteristic sound is produced by certain species, and the entire group flees. Underwater biological noises are also associated with such activities as breeding and competitive feed In addition, it was explained that certain noc turnal fish have well-developed sound-produ ing systems.

After a thorough study of the sounds mad by white whales held in captivity, the scienti and an associate at the University of Rhode Island, said in the Sears Foundation's Journ of Marine Research that their work "confirm previous evidence of a wide repertoire of recognizably different types of sound that, used singly or in combination, have specific meaning."

Working under the oldest continuous biological contract with the Office of Naval Research, the Director of the bioacoustic libra accumulates hundreds of miles of audio tape each year. When a new sound is discovered and thoroughly analyzed, it becomes part of the "Reference File of Biological Sounds," maintained since 1954 at the request of the U. S. Navy. Although this contains sounds recorded from researchers all over the worl an estimated 98 percent of the material was developed by the library's director and asso ciates.

To date, about 400 of the sound-producing organisms in the Western North Atlantic hav been auditioned by the scientist, ranging fro shrimp and crab to porpoise, whales, sea li sea cows, and other sorts of fish. Every ma rine animal, it was discovered, has a charac teristic sound "signature." (Source: Univer sity of Rhode Island--reprinted from Nationa Oceanographic Data Center Newsletter, De cember 31, 1963.)

Note: See Commercial Fisheries Review, July 1963 p. 27.

Pollution

ANTIPOLLUTION DAM WILL IMPROVE IFH RUNS IN SACRAMENTO RIVER:

Migratory steelhead and salmon in California's Sacramento River will have a better chance of suriving as a result of the apparently successful operation of the Spring Creek Dam. Built by the Bureau of Reclamation, U. S. Department of the Interior, to protect valuable commercial and sport fish spawning grounds, the new dam traps silt and chemical laden water, then slowly releases it in amounts below levels potentially toxic to fish in the Sacramento River.

Spring Creek flows into the Sacramento above Keswick Dam, carrying water which drains the historic mining areas near Redding. The water spilling from the watershed brings minute particles and soluble forms of copper, arsenic, lead, zinc, and other chemicals. By storing large quantities of runoff, then releasing the potentially toxic water in small quantities, the new antipollution dam protects spawning areas below Keswick Dam. Before construction of the dam, large numbers of fish were periodically destroyed by the polluted water from Spring Creek.

An Assistant Secretary of the U. S. Department of the Interior noted that the Spring Creek Dam marked a major milestone in the development of answers to problems of water pollution management. The dam facilitates irrigation by power production, provides flood control, and--most critically--handles the careful controlled discharge of potentially dangerous polluted water. The primary effect of the dam is to preserve and protect valuable salmon and steelhead resources. "It is an interesting footnote to the reported success of the dam," the Assistant Secretary said, "that this dam is, in reality, one of the prices we are paying in the 1960's for the development of northern California's rich mineral deposits a century ago. Its success, however, heightens the determination of Federal and State water planners and officials to put the full weight of modern scientific technology into solving the complex problems of water throughout the Nation."

The Spring Creek Dam reservoir provides storage space for some 2,000 acre-feet of sediment--enough to last an estimated 50 years. The dam was completed in the summer of 1963 and with heavy rains in September it received its first crucial test. A large storm in November filled the reservoir to more than half its holding capacity. Regulated releases began November 8 and continued through the first week in January. As the Spring Creek water was mixed with Sacramento River water and with water from the Trinity River, it was diluted to the point of being safe to fish in the lower river. In late 1963 and early 1964, there was an estimated runoff of 6,000 acre-feet of polluted water from the old mining areas, however, there were no reports of damage to salmon or steelhead in the Sacramento River.

Before construction of Shasta Dam, the heaviest runoff of polluted water coincided with flood flows from the Upper Sacramento, and the toxic compounds were diluted before they could do serious damage. But since 1944, Shasta Dam has controlled flooding on the Upper Sacramento and the polluted water from Spring Creek had been entering Keswick Reservoir at times when releases from Shasta were low.

Quality

GUIDELINES FOR TROLL SALMON VESSELS:

The continuing interest of fishermen in landed fish quality was demonstrated at a meeting held in early 1964 by the Seattle (Wash.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The meeting was mainly concerned with a review of quality improvement guidelines for Pacific troll salmon ice vessels. Fishermen's representatives discussed the quality problems encountered during the 1963 troll salmon season, including handling of catch, icing, physical damage, and sanitation of vessels. It was agreed that those are still the most important factors to be stressed, and that the use of preservative ices or refrigerated sea water in the troll fishery have not been decisive factors in landed fish quality. The Seattle laboratory will cooperate further with fishermen in providing additional recommendations for use of sanitizing agents and suggestions for educational material on icing time and temperature in relation to fish quality and bacterial spoilage.

* * * * *

NEW YORK STATE ACCEPTS USDI INSPECTION FOR FISH:

All fresh and frozen fish fillets purchased for New York State Institutions after June 1, 1964, will be inspected by U. S. Department of the Interior (USDI) Inspection Service. At that time, the New York State fishery inspection service will be disbanded.

The use of National Association of State Purchase Officials (NASPO) specifications has also been considered by New York, but will be deferred until NASPO specifications exist for all fishery products used by the State.

Salmon

ATLANTIC RESTORATION STUDIES:

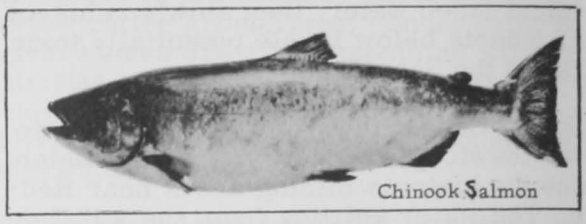
Experimental studies aimed at improving fish-cultural methods for Atlantic salmon will be carried out by the U. S. Bureau of Sport Fisheries and Wildlife. The experimental procedure will be designed by the Bureau's Maine Cooperative Fishery Unit, located at the University of Maine, in cooperation with all agencies concerned. Experiments will be conducted at the Craig Brook National Fish Hatchery. The objective of the program is to provide information that will enable fish culturists to produce hatchery-reared salmon with physiological characteristics approaching those of the wild fish, in predictable numbers, and at the proper time for stocking.

The salmon restoration programs of Maine's Sea-Run Commission require a dependable supply of one-year-old smolts for stocking purposes. In the past, experimental alterations in fish cultural practices have not succeeded in providing a dependable supply. Large and frequently unexplained mortalities of hatchery-reared fish have occurred in all stages of development.

* * * * *

MASSIVE PROGRAM TO INTRODUCE FALL CHINOOK SALMON RUN IN UPPER WILLAMETTE RIVER:

Plans for the construction of new fish passage facilities at Willamette Falls at Oregon City, Ore., were almost completed in early 1964. The new facilities will make it possible for fall chinook salmon to reach the upper Willamette River to spawn. (The upper river already has steelhead, coho salmon, and spring chinook salmon.) In conjunction with the new fishway, approximately $7\frac{1}{2}$ million young fall chinook are being released in the upper river in the vicinity of Eugene, Corvallis, and Harrisburg, Ore. Some fish were also being released in the lower areas of major tributary streams above the falls. Planting began in mid-February and will continue through April or May 1964.



Chinook Salmon

The young fall chinook salmon needed to stock the Willamette River were raised in the Eagle Creek National Fish Hatchery operated by the U. S. Bureau of Sport Fisheries and Wildlife, and in the Skamania Hatchery operated by Washington State. Surveys conducted by the Fish Commission of Oregon show that the Willamette River above the falls contains many spawning and rearing areas satisfactory for fall chinook salmon. Officials of the U. S. Fish and Wildlife Service said the joint effort of Federal and State agencies on the Willamette River is indicative of the cooperation which has prevailed throughout the program of salmon rehabilitation which began in 1949. (Northwest Regional Information Office, U. S. Department of the Interior, February 11, 1964.)

Shrimp

NEW CONTRACTS OPENED FOR FUTURES TRADING IN FROZEN SHRIMP AT CHICAGO:

Rules and specifications applicable to futures trading in frozen shrimp (No. 1 Contract) for delivery in September and November 1964, and January 1965, as issued early this year by the Chicago Mercantile Exchange, Chicago, Ill., are as shown on page 31.

Following issuance of the rules and specifications on page 31, the Board of Governors of the Chicago Mercantile Exchange, at a meeting held on February 6, 1964, voted to open new contracts for small

CIFICATION AND GRADE: All futures contracts for Frozen Sh shall be U. S. Grade "A" raw, frozen, grooved, headl th a count of 15/20 to the pound and shall be re- st to the catch of domestic boats leaving from and rn g to domestic ports. All shrimp must meet the re- qu nts of standards as promulgated by the U. S. Depart- m f Interior, Fish and Wildlife Service.

DING UNIT ON FUTURES CALL: All transactions cleared th the Clearing House shall be in units of 5,000 p .

RES PRICE FLUCTUATIONS AND LIMITS: The minimum p fluctuation in the futures market will be 1/10¢ per p equivalent of $5.00 per contract. A full cent price ch equals $50.00 per contract.

ly fluctuations are limited to 4¢ (400 points) per p upward or downward from the previous day's se price.

IES AND SUBSTITUTIONS ON THE FUTURES CALL: Ta ify for delivery Frozen Shrimp shall be tendered for d y in accordance with requirements of the Exchange rn d with specifications announced by the Board of G ors prior to the opening of the contract. The weight d livery unit shall be 5,000 pounds and the grade there- of ll comply with the contract of sale subject to such sub- st ns as are allowed.

livery unit of 5,000 pounds shall consist of 100 master rs, each master carton containing ten 5-pound pack- g The unit shall consist of not more than 3 lots or sub- w th no lot or sub-lot weighing less than 1,000 pounds. e entire unit must be processed by one packer and must re ed during any one calendar month. Each delivery n must be uniform as to species.

zen Shrimp which have been in storage more than e months are not deliverable except that a delivery unit ve ed in accordance with the rules during a delivery th is eligible for re-delivery through that month.

lowable variations in quantity of a delivery unit are as ws: Minimum delivery unit: 4,750 pounds—95 master rs of 50 pounds each. Maximum delivery unit: 5,250 ds—105 master cartons of 50 pounds each. A weight ce of 3% shall be permitted. Payment shall be made e basis of the exact quantity delivered.

shrimp delivered on Exchange contracts shall be of pack, glazed and packed in paperboard cartons which must meet all Federal regulations governing labeling and packing.

All shrimp shall conform in every respect to the provision of the Federal Food, Drug and Cosmetic Act together with all regulations promulgated thereunder.

Inspection certificates must be in good standing up to 5:00 P.M. on the business day following day of tender.

Par delivery shall be frozen shrimp in approved cold storage warehouses in the Dallas-Fort Worth, Texas, area. Delivery in other approved cold storage warehouses in the eight states of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, and South Carolina may be made at 1¢ a pound discount.

Brown, white, and pink Shrimp are deliverable at par but each delivery unit must be uniform.

PERMISSIBLE SUBSTITUTIONS: Frozen shrimp with a count of less than 15 to the pound shall be deliverable at par. Frozen shrimp with a count of 21/25 to the pound shall be deliverable with an allowance of 7¢ a pound. Grade B shrimp meeting all other requirements are deliverable at 4¢ a pound allowance. Each delivery unit must be uniform as to count per pound.

INSPECTION CERTIFICATES: Inspections will be made for members only and in the order of applications filed except precedence shall be given to inspections relating to transactions made on Exchange.

An official inspection certificate shall be final. No re-inspection upon the same application shall be permitted.

No member shall order an official inspection on another member's goods without the written order of such member.

An official inspection certificate on Frozen Shrimp issued by the Exchange shall state the location and the grade established. It shall bear the signature of the President or Assistant to the President and the seal of the Exchange. It shall state the date of inspection and the time when the certificate expires. This certificate shall be based upon an inspection certificate of the United States government and such government certificate (or a copy thereof) shall in all cases accompany the Exchange certificate.

The removal of the commodity from the place or location designated on the inspection certificate invalidates the certificate.

The charge for inspection shall be the cost plus 50¢ per lot for Exchange certificate.

LIFE OF INSPECTION CERTIFICATE. An Exchange inspection certificate for quality or weights of frozen shrimp in cold storage shall expire on the first business day of the sixth month following date of inspection provided the shrimp have remained in the same warehouse and have been kept under proper refrigeration in the meantime.

STORAGE CHARGES ON FUTURES CALL TO BE ON A PRO RATA BASIS. On all deliveries made on the futures call the seller must assume storage up to 5 P.M. on the second business day after the date of delivery. The proration shall be on the basis of 1/30th of the prevailing monthly storage rate at the particular warehouse raised to the nearest 5¢ and multiplied by the number of days remaining to the next storage expiration date (all months figured on the basis of 30 days). In no case shall handling charges be included in such proration. The storage charges shall be paid in advance by the person holding shrimp on the storage expiration date and pro rata charges prepaid by such holder shall be added to and shown on the tender notice.

SPECULATIVE POSITION LIMITS. No member for himself or for a customer, and no firm for its own account or for the account of a customer, may carry, control, or have a proprietary interest in more than a total of 200 Frozen Shrimp contracts with a maximum of 200 in any one contract month, nor shall any individual, customer, or firm exceed the above limits in any single day's trading.

TRADING HOURS. From 9:25 A.M. to 12:45 P.M.

COMMISSION CHARGES. The uniform minimum fee for the purchase, sale, or purchase and sale of a shrimp futures contract is $18.00 per unit.

WAREHOUSES APPROVED FOR SHRIMP DELIVERIES:

- Alford Refrigerated Warehouses, Inc.—260, McBride Lane, Corpus Christi, Tex.
- Alford Refrigerated Warehouses, Inc.—318 Cadiz Street, Dallas, Tex.
- Houston Terminal Warehouse & Cold Storage Co.—Houston, Texas
- Ingram Freezers—Dallas, Texas
- Merchants Cold Storage Co.—Fort Worth, Texas
- New Orleans Cold Storage & Warehouse Co. Ltd.—124 Airline Highway, Metairie, La.
- Texas Ice and Refrigerating Co.—Fort Worth, Texas
- U. S. Cold Storage Corp.—Fort Worth, Texas

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CLASSIFICATION AND GRADE: All futures contracts for Frozen Shrimp shall be U. S. Grade "A" raw, frozen, headless with a count of 31/35 to the pound and shall be restricted to the catch of domestic boats leaving from and returning to domestic ports. All shrimp must meet the requirements of standards as promulgated by the U. S. Department of Interior, Fish and Wildlife Service.

TRADING UNIT ON FUTURES CALL: All transactions cleared through the Clearing House shall be in units of 5,000 pounds.

FUTURES PRICE FLUCTUATIONS AND LIMITS: The minimum price fluctuation in the futures market will be 1/10¢ per pound, equivalent of $5.00 per contract. A full cent price change equals $50.00 per contract.

Daily fluctuations are limited to 4¢ (400 points) per pound, upward or downward from the previous day's settling price.

DELIVERIES AND SUBSTITUTIONS ON THE FUTURES CALL: To qualify for delivery Frozen Shrimp shall be tendered for delivery in accordance with requirements of the Exchange rules and with specifications announced by the Board of Governors prior to the opening of the contract. The weight of a delivery unit shall be 5,000 pounds and the grade thereof shall comply with the contract of sale subject to such substitutions as are allowed.

A delivery unit of 5,000 pounds shall consist of 100 master cartons, each master carton containing ten 5-pound packages. The unit shall consist of not more than 3 lots or sub-lots with no lot or sub-lot weighing less than 1,000 pounds. The entire unit must be processed by one packer and must be stored during any one calendar month. Each delivery unit must be uniform as to species.

Frozen Shrimp which have been in storage more than eight months are not deliverable except that a delivery unit delivered in accordance with the rules during a delivery month is eligible for re-delivery through that month.

Allowable variations in quantity of a delivery unit are as follows: Minimum delivery unit: 4,750 pounds—95 master

cartons of 50 pounds each. Maximum delivery unit: 5,250 pounds—105 master cartons of 50 pounds each. A weight tolerance of 3% shall be permitted. Payment shall be made on the basis of the exact quantity delivered.

All shrimp delivered on Exchange contracts shall be of good pack, glazed and packed in paperboard cartons which must meet all Federal regulations governing labeling and packing.

All shrimp shall conform in every respect to the provision of the Federal Food, Drug and Cosmetic Act together with all regulations promulgated thereunder.

Inspection certificates must be in good standing up to 5:00 P.M. on the business day following day of tender.

Par delivery shall be frozen shrimp in approved cold storage warehouses in the Dallas-Fort Worth, Texas, area. Delivery in other approved cold storage warehouses in the eight states of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, and South Carolina may be made at 1¢ a pound discount.

Brown, white, and pink Shrimp are deliverable at par but each delivery unit must be uniform.

PERMISSIBLE SUBSTITUTIONS: Frozen shrimp with a count of 36/42 to the pound and meeting all other requirements of these rules shall be deliverable at 5¢ a pound allowance. Frozen shrimp with a count of 43/50 to the pound and meeting all other requirements of these rules shall be deliverable at 10¢ a pound allowance, and Frozen Shrimp with a count of 51/60 shall be deliverable at 15¢ a pound allowance. Grade B shrimp meeting all other requirements of these rules shall be deliverable at 4¢ a pound allowance. Each delivery unit must be uniform as to count per pound.

INSPECTION CERTIFICATES: Inspections will be made for members only and in the order of applications filed except precedence shall be given to inspections relating to transactions made on Exchange.

An official inspection certificate shall be final. No re-inspection upon the same application shall be permitted.

No member shall order an official inspection on another member's goods without the written order of such member.

An official inspection certificate on Frozen Shrimp issued by the Exchange shall state the location and the grade established. It shall bear the signature of the President or Assistant to the President and the seal of the Exchange. It shall state the date of inspection and the time when the certificate expires. This certificate shall be based upon an inspection certificate of the United States government and such government certificate (or a copy thereof) shall in all cases accompany the Exchange certificate.

The removal of the commodity from the place or location designated on the inspection certificate invalidates the certificate.

The charge for inspection shall be the cost plus 50¢ per lot for Exchange certificate.

LIFE OF INSPECTION CERTIFICATE: An Exchange inspection certificate for quality or weights of frozen shrimp in cold storage shall expire on the first business day of the sixth month following date of inspection provided the shrimp have remained in the same warehouse and have been kept under proper refrigeration in the meantime.

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SPECULATIVE POSITION LIMITS: No member for himself or for a customer, and no firm for its own account or for the account of a customer, may carry, control, or have a proprietary interest in more than a total of 200 Frozen Shrimp contracts with a maximum of 200 in any one contract month, nor shall any individual, customer, or firm exceed the above limits in any single day's trading.

Note: See Commercial Fisheries Review, December 1963 p. 42.

* * * * *

UNITED STATES SHRIMP SUPPLY INDICATORS, JANUARY 1964:

Item and Period	1964	1963	1962	1961	1960
			(1,000 Lbs., Heads-Off)		
Total landings, So. Atl. and Gulf States:					
March	-	3,632	3,331	4,754	4,099
February	-	3,986	4,123	3,910	3,784
January	5,600	3,993	3,840	5,686	5,402
December	-	9,500	8,615	6,538	7,099
November	-	13,212	12,177	9,996	14,454
January-December	-	138,700	105,839	91,396	141,035
Quantity canned, Gulf States 1/:					
March	-	92	86	35	117
February	-	281	241	90	204
January	230	592	492	183	266
December	-	2,175	1,879	816	894
November	-	2,495	2,727	2,175	1,535
January-December	-	29,468	23,322	14,500	26,394
Frozen inventories (as of end of each mo.) 2/:					
March 31	-	27,970	16,607	31,345	23,232
February 28	-	28,039	19,012	37,612	29,063
January 31	-	28,487	21,328	37,842	34,332
December 31	-	3/45,764	31,577	19,755	40,913
November 30	-	3/42,142	27,500	20,668	37,264
October 31	-	3/37,418	21,315	17,811	31,209
Imports 4/:					
March	-	13,616	9,658	10,347	8,545
February	-	12,100	10,599	8,932	7,657
January	-	13,139	12,907	12,338	8,596
December	-	16,296	15,798	15,442	12,411
November	-	14,759	17,964	14,852	13,516
January-December	-	151,530	141,183	126,268	113,418
			(¢/lb., 26-30 Count, Heads-Off)		
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
March	-	85.5	80.9	56.0	56.3
February	-	85.7	78.9	53.5	51.8
January	60-69	85.0	76.3	52.5	49.5
December	-	5/54-65	82.9	75.2	54.2
November	-	5/52-62	84.5	73.5	54.0
October	-	5/51-64	90.0	68.7	53.0
September	-	5/55-64	90.9	70.1	52.2
August	-	59.0	83.6	66.1	52.0
Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.:					
March	-	102-106	94-95	69-71	65-68
February	-	102-106	93-95	69-71	65-67
January	78-83	102-106	91-94	69-71	64-66
December	-	75-82	101-107	91-92	68-70
November	-	71-78	105-110	89-92	69-73

(Table continued on next column.)

Item and Period	1964	1963	1962	1961	1960
			(1,000 Lbs., Heads-Off)		
October	-	67-75	108-115	83-90	69-73
September	-	73-77	113-118	87-90	65-70
August	-	75-81	110-112	76-91	64-67

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Inventory of October 31, 1963, includes 1,203,000 pounds; November 30, 1963, includes 1,189,000 pounds; and December 31, 1963, includes 1,256,000 pounds for firms not reporting previously.
4/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
5/Range in prices at Tampa, Fla., Morgan City, La., area; Port Isabel and Brownsville, Texas, only.
Note: January 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads on weight multiply by 1.68.

Tuna

FISHING BASE IN PALAU ISLANDS PLANNED BY CALIFORNIA FIRM:

A California tuna-packing firm has plans under way to establish a tuna-fishing base in the Palau Islands (U. S. Trust Territory of the Pacific Islands in the Pacific Ocean east of the Philippines). Two representatives of the United States tuna cannery were in Koror, Palau, in February 1964 when they met with officials of a local construction company to discuss construction bid plans.

One of the first construction items discussed was housing quarters needed by the middle of May for some 120 fishermen. Other facilities for the proposed base to be built or installed on Malakai Island include a 1,200-ton fish-storage freezer, ice-making machine, water-storage tanks, and office space. Bid negotiations for actual construction of the plant are to begin in mid-May and it is planned to have the plant in operation by July 1, 1964.

Plans call for six 25-gross-ton tuna ves- s to begin operating from Koror's main p with 72 Okinawans and 48 Palauans as cwmen and fishermen, according to an nomic Development Officer of the Trust ritory. Under the provisions of the con- t signed by the Trust Territory and the lifornia firm's officials, the Palauans will rained as tuna fishermen and eventually tuna-fishing vessels will be manned com- ely by them.

The Trust Territory Officer said that ex- sion of tuna fishing in other parts of the ritory will depend to a great degree on success of the initial program in Palau. ess release, Trust Territory of the Pa- Islands, Saipan, February 17, 1964.)

ited States Fisheries

MMERCIAL FISHERY LANDINGS, 1963:

Total Landings: Fish and shellfish land- s in the United States in 1963 were down 5 percent as compared with 1962. Land- s were about 600 million pounds less than 962--due mainly to reduced catches of nhaden, salmon, whiting, and ocean perch.

Menhaden: Landings in 1963 totaled about billion pounds--524 million pounds less n during 1962. Production was down in ry state except in North Carolina where catch of 190 million pounds was 67 mil- n pounds more than in the previous year. North Carolina increase resulted from oductive fishery in the last two months he year.

Salmon: On the basis of the reported pack anned salmon, it is estimated that the 3 catch in Alaska was approximately 214 lion pounds--about 60 million pounds less n in 1962.

Shrimp: There was a significant gain in dings of South Atlantic and Gulf shrimp ing 1963 due to sharply increased land- s in the Gulf States. Production in the th Atlantic and Gulf areas totaled 220 mil- n pounds--an increase of 52 million pounds 31 percent.

Tuna: Landings (including bonito) in Cali- nia amounted to about 315 million pounds--

United States Commercial Fishery Landings of Certain Species, 1962-63

Species	1/1963	1962
	...(1,000 Lbs.)...	
Anchovies, Calif.	3,300	2,764
Cod, Atlantic:		
Maine	2,000	2,260
Mass.	33,600	40,647
Other	3,600	4,003
Total cod	39,200	46,910
Crabs:		
Dungeness, Alaska	11,800	8,990
King, Alaska	77,000	52,782
Haddock:		
Maine	2,800	2,545
Mass.	119,600	131,558
Other	200	147
Total haddock	122,600	134,250
Halibut: 2/		
Alaska	22,400	27,682
Wash., Oreg., and Calif.	11,800	12,657
Total halibut	34,200	40,339
Herring:		
Maine	147,000	156,699
Alaska	31,000	33,876
Industrial Fish, Maine and Mass. 3/	47,900	31,680
Mackerel:		
Jack, Calif.	97,500	89,979
Pacific	37,300	48,579
Menhaden	1,726,000	2,249,917
Ocean perch, Atl.	108,200	123,983
Pollock	14,300	16,333
Salmon	280,000	314,566
Sardine, Pacific	6,000	15,363
Scallops, sea, New Bedford (meats)	19,200	24,634
Shrimp (heads-on):		
So. Atl. and Gulf	220,300	167,804
Other	18,700	23,302
Total shrimp	239,000	191,106
Tuna	315,000	312,157
Whiting:		
Maine	15,900	17,832
Mass.	55,300	75,384
Other	9,600	11,872
Total whiting	80,800	105,088
Total all above items	3,437,300	3,999,995
Other 4/	1,212,700	1,256,163
Grand total	4,650,000	5,256,158

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

1 percent more than in 1962. Atlantic Coast landings amounted to 12 million pounds as compared with 7.2 million pounds the previous year.

Mackerel: Pacific mackerel landings in 1963 amounted to 37 million pounds--down 11 million pounds as compared with 1962.

Landings of jack mackerel (97 million pounds) increased about 7.5 million pounds.

* * * * *

FISH STICKS AND PORTIONS, OCTOBER-DECEMBER 1963:

United States production of fish sticks and fish portions amounted to 45.3 million pounds during the fourth quarter of 1963, according to preliminary data. Compared with the same quarter of 1962, this was a gain of 3.0 million pounds or 7 percent. Fish sticks (20.2 million pounds) were up 1.2 million pounds or 6 percent, while fish portions (25.1 million pounds) were up 1.8 million pounds or 8 percent.

Cooked fish sticks (18.5 million pounds) made up 92 percent of the October-December 1963 fish stick total. There were 24.3 million pounds of breaded fish portions produced of which 19.8 million pounds were raw. Unbreaded fish portions amounted to 796,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 16.7 and 14.0 million pounds, respectively. The Inland and Gulf States ranked second with 2.0 million pounds of fish sticks and 10.3 million pounds of fish portions. The remaining 2 million pounds of fish sticks and fish portions were produced by firms in the Pacific States.

Table 1 - U.S. Production of Fish Sticks by Months and Type, October-December 1963 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
October	7,201	882	8,083
November	5,790	394	6,184
December	5,526	429	5,955
Total 4th Qtr. 1963 1/	18,517	1,705	20,222
Total 4th Qtr. 1962	17,563	1,467	19,030
Total 1963 1/	73,898	4,932	78,830
Total 1962	66,801	5,416	72,217

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, October-December 1963 and 1962

Area	1/1963		2/1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	20	16,742	23	14,989
Inland & Gulf States	7	1,977	5	2,368
Pacific Coast States	9	1,503	10	1,673
Total	36	20,222	38	19,030

1/Preliminary.
2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1959-1963

Month	1/1963	2/1962	1961	1960	1959
	(1,000 Lbs.)				
January	7,554	6,082	6,091	5,511	6,277
February	8,241	6,886	7,097	6,542	6,352
March	8,053	7,658	7,233	7,844	5,604
April	6,546	5,719	5,599	4,871	4,717
May	5,750	5,643	5,129	3,707	4,407
June	6,125	5,117	4,928	4,369	4,583
July	4,836	3,740	3,575	3,691	3,790
August	5,674	5,760	6,927	5,013	3,879
September	5,829	6,582	5,206	5,424	5,353
October	8,083	6,698	6,133	6,560	5,842
November	6,184	6,305	6,288	6,281	4,831
December	5,955	6,027	5,618	5,329	4,743
Total	78,830	72,217	69,824	65,142	60,378

1/Preliminary.
2/Revised.

Table 4 - U.S. Production of Fish Portions by Months and Type, October-December 1963 1/

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.)				
October	2,010	7,510	9,520	311	9,831
November	1,283	6,295	7,578	278	7,856
December	1,137	6,030	7,167	207	7,374
Tot. 4th Qtr. 1963 1/	4,430	19,835	24,265	796	25,061
Tot. 4th. Qtr. 1962	4,132	18,337	22,469	827	23,296
Tot. 1963 1/	16,482	74,738	91,220	3,025	94,245
Total 1962	14,007	62,290	76,297	2,381	78,678

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Areas, October-December 1963 and 1962

Area	1/1963		2/1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	14,025	23	13,833
Inland & Gulf States	10	10,310	11	8,775
Pacific Coast States	8	726	7	688
Total	40	25,061	41	23,296

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1959-1963

Month	1/1963	2/1962	1961	1960	1959
	(1,000 Lbs.)				
January	8,173	5,077	4,303	3,632	2,692
February	7,361	6,360	4,902	3,502	3,025
March	8,835	7,036	5,831	4,706	3,225
April	7,919	6,408	4,484	3,492	2,634
May	7,293	5,818	3,879	3,253	2,684
June	8,774	6,137	4,039	3,995	3,247
July	4,523	4,679	3,962	4,088	2,227
August	6,685	6,687	4,963	3,558	2,796
September	9,621	7,180	5,745	4,631	3,558
October	9,831	9,871	6,759	5,275	4,314
November	7,856	7,406	5,789	4,790	3,483
December	7,374	6,019	5,191	4,459	3,262
Total	94,245	78,678	59,847	49,381	37,147

1/Preliminary.
2/Revised.

Total production of fish sticks and fish portions during 1963 (173.1 million pounds) was 22.2 million pounds or 15 percent above 1962. Fish sticks (78.8 million pounds) were up 6.6 million pounds or 9 percent; and fish portions (94.3 million pounds) increased 15.6 million pounds or 20 percent.

U.S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

December 1963: During December 1963, a total of 33 vessels of 5 net tons and over were issued first documents as fishing craft as compared with 12 in December 1962. There were 27 documents cancelled for fishing vessels in December 1963 as compared with 24 in December 1962.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, December 1963 with Comparisons

Area (Customs Port)	December 1963	December 1962	January-December 1963	January-December 1962
	(Number)			
Issued first documents 2/:				
New England	2	1	23	28
Middle Atlantic	1	1	18	3
Chesapeake	6	2	66	43
South Atlantic	6	1	77	47
Gulf	10	4	239	110
Pacific	8	3	160	130
Great Lakes	-	-	5	5
Puerto Rico	-	-	2	2
Total	33	12	590	368
Removed from documentation 3/:				
New England	5	4	48	24
Middle Atlantic	3	5	47	39
Chesapeake	2	-	25	23
South Atlantic	4	-	53	38
Gulf	7	6	118	104
Pacific	5	8	87	111
Great Lakes	1	1	15	22
Hawaii	-	-	3	3
Puerto Rico	-	-	-	1
Total	27	24	396	365

For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, December 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	7	7
10-19	10	9
20-29	6	2
30-39	1	1
40-49	-	3
50-59	-	1
60-69	2	2
70-79	5	-
80-89	1	-
90-99	-	1
100-119	1	-
120-139	-	1
Total	33	27

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Vessels issued first documents as fishing craft were built: 23 in 1963; 1 in 1959; 1 in 1958; 1 in 1957; 6 prior to 1951; and 1 unknown.
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.

* * * * *

1963 with Comparisons: The downward trend in United States vessels receiving first documents as fishing vessels was reversed in 1963 (tables 1 & 2) when documents issued

Table 1 - U. S. Fishing Vessels 1/--Documents Issued and Canceled, 1938-63

Year	Issued			Canceled 2/
	First Documents	Redocuments	Total	
	(Number)			
1963	569	21	590	396
1962	352	16	368	365
1961	410	20	430	341
1960	408	24	432	290
1959	479	34	513	3/
1958	684	29	713	3/
1957	601	18	619	3/
1956	521	17	538	3/
1955	418	23	441	3/
1954	717	28	745	3/
1953	729	25	754	3/
1952	675	24	699	3/
1951	780	28	808	3/
1950	812	29	841	3/
1949	1,002	42	1,044	3/
1948	1,184	38	1,222	3/
1947	1,300	48	1,348	3/
1946	1,085	117	1,202	3/
1945	741	3/	3/	3/
1944	635	3/	3/	3/
1943	358	3/	3/	3/
1942	358	3/	3/	3/
1941	354	3/	3/	3/
1940	320	3/	3/	3/
1939	357	3/	3/	3/
1938	376	3/	3/	3/

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
3/Data not compiled.

Table 2 - U. S. Fishing Vessels 1/--Documents Issued by Tonnage Groups, 1955-1963

Tons	1963 2/	1962 2/	1961 2/	1960 3/	1959 3/	1958 3/	1957 3/	1956 3/	1955 3/
	(Number)								
5-9	123	63	134	227	231	241	246	252	214
10-19	178	137	130	90	96	111	121	109	88
20-29	61	33	37	33	69	107	69	59	41
30-39	23	33	27	16	34	135	110	62	36
40-49	35	15	19	18	25	65	25	4	12
50-59	16	9	21	5	10	13	13	5	5
60-69	33	17	21	2	2	1	1	2	1
70-79	73	36	17	-	-	-	-	2	4
80-89	12	3	2	1	1	1	1	-	-
90-99	2	1	3	-	2	3	-	-	2
100-109	3	1	-	-	-	-	2	4	4
110-119	3	3	1	1	1	-	1	3	1
120-129	-	1	-	-	-	-	2	8	1
130-139	-	2	1	1	1	-	3	4	2
140-149	9	-	-	1	1	-	-	-	2
150-159	1	-	-	2	-	-	-	3	2
160-169	1	-	1	-	1	1	-	-	-
170-179	-	-	-	-	1	-	2	1	-
180-189	-	-	-	-	2	3	2	3	2
190-199	-	-	1	1	-	1	-	-	1
200-249	3	4	2	2	-	1	-	-	-
250-299	5	2	2	2	1	-	-	-	-
300-349	2	1	1	6	-	1	1	-	-
350-399	-	-	2	-	1	-	2	-	-
450-499	3	2	1	-	-	-	-	-	-
500-549	-	2	1	-	-	-	-	-	-
550-599	-	1	3	-	-	-	-	-	-
600-649	1	-	-	-	-	-	-	-	-
750-799	2	1	1	-	-	-	-	-	-
800-849	1	1	2	-	-	-	-	-	-
Total	590	368	430	408	479	684	601	521	418

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Based on gross tons. Redocumented vessels that were previously removed from the records are included in the following years: 1961, 20; 1962, 16; and 1963, 21.
3/Based on net tons. Includes only vessels receiving first documents.

showed an increase of 60 percent over 1962. Although much of the gain was concentrated in vessels of less than 20 tons, there was also some increase in most of the larger tonnage groups.

Documents issued in 1963 exceeded cancellations by 194 vessels. In the previous year, documents cancelled almost equalled those issued.

Source: Monthly Supplement to Merchant Vessels of the United States. Bureau of Customs, U. S. Treasury Department.

U. S. Foreign Trade

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, JANUARY-DECEMBER 1963:

United States imports of fish meal and scrap in 1963 totaled 383,107 short tons, according to preliminary data. About 83.3 percent of the fish meal and scrap imports in 1963 entered through the Customs Districts of Maryland, Georgia, Mobile (Ala.), Galveston (Tex.), San Francisco (Calif.), Los Angeles (Calif.), and Washington.

United States Imports of Fish Meal and Scrap by Customs Districts, January-December 1963 1/

Customs Districts	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	(Short Tons)												
Maine and New Hampshire	50	602	-	-	500	50	352	551	460	120	679	500	3,864
Vermont	29	-	-	-	-	35	65	-	96	30	-	-	255
Massachusetts	-	852	80	15	-	60	90	160	185	29	72	67	1,610
St. Lawrence (N.Y.)	-	-	33	-	-	-	30	60	-	30	-	-	153
Buffalo (N.Y.)	-	-	-	-	-	-	-	3	-	-	-	-	3
New York (N.Y.)	650	880	-	1,028	501	300	1,102	220	578	40	129	242	5,680
Philadelphia (Pa.)	-	1,414	728	250	-	100	100	-	-	-	-	222	2,814
Maryland	551	4,684	4,682	1,492	2,645	1,298	661	2,362	1,758	6,338	882	7,074	34,427
North Carolina	108	-	3,583	1,102	1,102	-	772	1,268	937	1,378	1,433	331	12,014
Georgia	2,589	5,239	12,897	2,035	9,532	2,147	4,964	6,510	3,145	4,253	-	3,351	56,662
Florida	-	-	-	-	-	-	-	-	518	-	-	548	1,066
Mobile (Ala.)	4,132	8,135	11,195	2,019	3,972	4,058	4,961	5,422	9,399	4,435	1,314	6,335	65,377
New Orleans (La.)	2,949	-	-	-	551	-	1,488	-	-	-	1,540	-	6,528
Sabine (Tex.)	546	546	551	551	-	-	557	-	-	1,114	-	557	4,422
Galveston (Tex.)	1,101	8,829	3,060	2,427	4,781	2,372	2,579	4,084	8,829	2,989	4,159	2,328	47,538
Los Angeles (Calif.)	-	1,828	2,662	1,492	1,148	1,009	4,295	6,405	2,643	2,639	330	1,187	25,639
San Francisco (Calif.)	2,646	4,290	4,027	9,568	2,225	1,167	6,013	12,648	2,978	4,063	3,154	3,129	55,903
Oregon	308	-	219	479	219	165	-	-	-	-	343	110	1,843
Washington	1,782	2,140	2,311	2,906	2,710	3,713	4,892	2,405	2,125	2,943	2,360	3,136	33,423
Hawaii	-	40	591	-	15	55	8,262	20	15	-	100	-	9,098
Montana & Idaho	-	-	10	-	-	-	-	-	-	-	-	-	10
Dakota	134	60	158	115	136	245	257	385	190	195	210	-	2,085
Duluth (Minn.) and Superior (Wisc.)	743	530	917	1,070	1,015	1,445	1,538	980	435	456	263	550	9,942
Michigan	167	17	34	58	97	233	188	503	375	397	401	62	2,532
Chicago (Ill.)	-	-	157	-	-	-	22	-	-	-	-	-	179
Colorado	-	-	-	-	-	-	35	-	-	-	-	-	35
Grand total	18,495	40,086	47,895	26,607	31,149	18,452	43,223	43,987	34,666	31,449	17,369	29,729	383,107

1/Preliminary.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS, NOVEMBER 1963:

Airborne fishery imports into the United States in November 1963 were up 15.3 percent in quantity and 2.0 percent in value from those in the previous month. Total airborne imports during January-November 1963 were about the same as those in the same period of 1962.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in November 1963, shipments consisted of 454,857 pounds of fresh or frozen raw headless, 20,735 pounds of frozen raw peeled, and 53,006 pounds of unclassified shrimp. Over 92 percent of the airborne shrimp arrivals in November entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Laredo (Tex.), Los Angeles (Calif.), and San Francisco (Calif.).

Airborne imports of shellfish other than shrimp in November consisted mainly of 46,521 pounds of fresh or frozen spiny lobster products. All of the airborne imports of spiny lobsters entered through the Customs District of Florida.

Fish fillets from Mexico were the leading finfish products imported by air in November.

U. S.1/ Airborne Imports of Fishery Products, January-November 1963 with Comparative Data

Product and Origin2/	1963 November Qty.3/	1963 November Value4/	1963 Jan.-Nov. Qty.3/	1963 Jan.-Nov. Value4/	1962 Jan.-Nov. Qty.3/	1962 Jan.-Nov. Value4/
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Fish:						
Mexico	19.6	3.6	264.8	70.0	964.2	160.2
British Honduras	1.8	0.5	43.5	10.7	34.2	7.5
Honduras	-	-	16.5	4.3	0.8	0.3
Japan	-	-	2.0	8.2	-	-
United Kingdom	0.4	0.7	3.5	7.4	0.5	1.2
Iceland	-	-	1.2	7.4	13.9	142.9
Peru	4.9	4.5	10.1	10.6	0.3	0.7
Panama	-	-	-	-	1.9	15.9
Panama	-	-	0.9	0.4	7.8	1.3
U.S.S.R.	-	-	26.8	70.2	-	-
[illegible]	-	-	-	-	22.1	17.6
Costa Rica	-	-	-	-	5.6	0.9
Other countries	-	-	3.5	0.9	39.0	12.8
Total Fish	26.7	9.3	372.8	190.1	1,090.3	361.3
Shrimp:						
Guatemala	-	-	141.6	74.0	292.8	146.7
El Salvador	39.7	17.5	297.7	190.2	623.5	387.4
Honduras	-	-	99.8	52.3	36.5	23.3
Nicaragua	27.8	15.5	505.0	174.6	996.4	339.6
Costa Rica	15.8	5.4	598.3	284.3	679.3	303.1
Panama	98.8	55.3	1,541.3	831.5	1,739.3	970.2
Venezuela	338.6	140.7	4,500.5	2,096.8	3,033.3	1,644.2
Ecuador	-	-	111.6	39.4	12.2	3.4
Peru	-	-	2.6	0.9	-	-
Mexico	-	-	13.2	6.9	24.8	9.1
Netherlands Antilles	-	-	-	-	3.1	2.7
Argentina	-	-	-	-	10.5	4.8
British Honduras	7.9	8.6	7.9	8.6	-	-
Total Shrimp	528.6	243.0	7,819.5	3,759.5	7,451.7	3,834.5
Fish other than Shrimp:						
Mexico	3.5	3.2	101.1	60.8	87.7	55.9
British Honduras	34.6	28.1	344.5	281.8	266.0	176.4
El Salvador	-	-	5.0	3.6	6.2	4.6
Honduras	-	-	17.0	7.0	140.7	103.9
Nicaragua	-	-	164.5	100.0	1.2	0.6
Costa Rica	-	-	73.8	60.1	5.6	4.8
Panama	0.8	0.7	66.5	50.2	30.0	21.3
Netherlands Antilles	12.7	11.8	45.5	32.7	58.0	34.8
Colombia	-	-	8.0	21.7	1.8	5.1
Ecuador	-	-	2.2	1.8	2.6	1.6
Peru	-	-	0.8	0.9	-	-
Leeward and Windward Islands	-	-	1.6	0.5	28.7	10.9
British Guiana	-	-	1.7	0.3	-	-
India	-	-	213.3	109.2	224.1	91.1
Venezuela	-	-	13.7	6.0	22.3	13.6
Panama	1.9	1.2	5.0	3.8	1.0	1.0
Guatemala	-	-	-	-	12.9	6.3
Bahamas	-	-	5.3	5.2	32.5	11.0
African Republic	-	-	25.3	23.8	29.7	26.5
Yugoslavia	-	-	1.2	0.7	-	-
Poland	-	-	-	-	2.3	1.0
Other countries	-	-	2.0	2.9	8.3	12.0
Total Shellfish (except shrimp)	53.5	45.0	1,098.0	773.0	961.6	582.4
Grand Total	608.8	297.3	9,290.3	4,722.6	9,503.6	4,778.2

Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
If the country of origin is not known, the country of shipment is shown.
Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
F.A.S. point of shipment. Does not include U. S. import duties, air freight, or insurance.
These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, November 1963, U. S. Bureau of Census.

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

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PROCESSED EDIBLE FISHERY PRODUCTS, DECEMBER 1963:

United States imports of processed edible fishery products in December 1963 were down 17.1 percent in quantity and 7.4 percent in value from those in the previous month. In December 1963 there was a decline in imports of groundfish fillets, canned sardines in oil, and canned oysters, which was partly offset by higher imports of canned tuna in brine and canned sardines not in oil.

Compared with the same month in 1962, imports in December 1963 were up 3.9 percent in quantity and 16.1 percent in value. The gain was due mainly to larger imports of canned tuna in brine and fish blocks and slabs. There was a decline in imports of canned sardines (in oil and not in oil) and most fish fillet items, particularly swordfish and haddock fillets.

U. S. Imports and Exports of Processed Edible Fishery Products, December 1963 with Comparisons

Item	QUANTITY December 1963	QUANTITY December 1962	QUANTITY Jan.-Dec. 1963	QUANTITY Jan.-Dec. 1962	VALUE December 1963	VALUE December 1962	VALUE Jan.-Dec. 1963	VALUE Jan.-Dec. 1962
	(Millions of Lbs.)				(Millions of $)			
Fish & Shellfish:								
Imports1/	42.9	41.3	535.3	552.0	13.7	11.8	157.4	160.6
Exports2/	4.3	4.8	34.4	35.6	2.1	2.1	16.6	16.0

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

For the year 1963, imports were down 3.0 percent in quantity and 2.0 percent in value from those in 1962. Fluctuations in individual items were much greater than the overall totals indicate. Imports were down sharply in 1963 for canned sardines in oil and canned salmon. There was also a considerable decline in imports of haddock fillets, flounder fillets, halibut fillets, swordfish fillets, sea catfish fillets, and canned tuna other than albacore in brine. On the other hand, there was a large increase in imports of fish blocks and slabs as well as heavier shipments of ocean perch fillets, yellow pike fillets, canned albacore tuna in brine, canned sardines not in oil, canned crab meat, and canned oysters.

Exports of processed edible fish and shellfish from the United States in December 1963 were up 16.2 percent in quantity and 16.7 percent in value from those in the previous month. In December, all of the leading canned fish export items were exported in larger quantity except canned sardines not in oil.

Compared with the same month in 1962, the exports in December 1963 were down 10.4 percent in quantity but the value was the same in both months. This December there were larger shipments of canned mackerel and canned shrimp, but exports of canned sardines not in oil were sharply lower.

Processed fish and shellfish exports in 1963 were down 3.4 percent in quantity but up 3.8 percent in value from those in 1962. The decline in quantity was due mainly to lower shipments of canned sardines not in oil. There were increases in exports of the higher-priced canned salmon and canned shrimp, as well as larger shipments of canned squid and canned mackerel. Although not covered in the table, exports of frozen shrimp were up sharply in 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

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

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

(2) See Commercial Fisheries Review, Mar. 1964 p. 31.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1964:

The wholesale price index for edible fish and shellfish (fresh, frozen, and canned) in February 1964 dropped 0.7 pe cent from the previous month. It was the first decline sinc November 1963 following a series of price increases throu January this year. The decline from January to February w due to lower prices for frozen halibut and salmon, ocean p fillets, oysters, frozen shrimp, and canned salmon. But th were partly offset by higher February prices for Great La fresh-water fish, fresh shrimp, and several of the other canned fish products. At 109.0 percent of the 1957-59 ave the index this February was 7.9 percent lower than the sa month a year earlier when prices, with few exceptions, we higher for nearly all items.

The drawn, dressed, or whole finfish subgroup index in F ruary 1964 was up 3.7 percent from a month earlier, but w lower by 1.5 percent as compared with February a year ag Largely responsible for the increase from January to Feb ary were higher prices at Boston for ex-vessel large hadd (up 13.6 percent), at Chicago for fresh Lake Superior white fish (up 23.6 percent), and at New York City for Great Lak round yellow pike (up 26.5 percent). Compared with Februa 1963, prices this February were lower for all items in the s group except for fresh drawn haddock at Boston which this F ruary was priced sharply higher (up 69.3 percent) because d fewer trips and generally high ex-vessel prices.

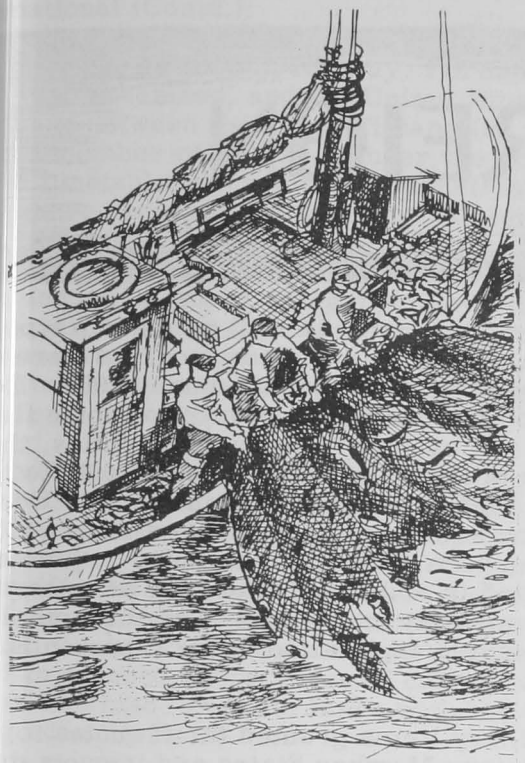
Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Feb. 1964	Jan. 1964	Feb. 1964	Jan. 1964	Dec. 1963	Feb. 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.0	2/109.8	107.5	118.4
Fresh & Frozen Fishery Products:					113.2	113.0	110.5	124.4
Drawn, Dressed, or Whole Finfish:					120.8	116.5	114.4	122.7
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.21	.18	160.2	141.0	133.0	94.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.31	.33	90.2	96.1	96.1	125.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.85	116.0	118.4	118.4	133.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.58	.47	85.8	69.4	61.2	100.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.62	.49	101.6	2/80.3	83.5	113.0
Processed, Fresh (Fish & Shellfish):					114.0	115.4	111.5	128.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.58	.59	140.8	142.0	138.4	98.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.91	.86	106.6	100.8	95.5	130.7
Oysters, shucked, standards	Norfolk	gal.	7.00	7.63	118.0	128.6	126.5	130.7
Processed, Frozen (Fish & Shellfish):					100.7	102.8	101.3	117.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.9	98.9	98.9	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.40	.39	115.8	114.3	115.8	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.34	114.0	117.5	121.0	115.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.77	.81	91.3	95.5	91.9	123.4
Canned Fishery Products:					102.0	104.7	102.5	108.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.75	23.50	94.8	102.4	102.4	107.9
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.63	11.63	103.3	103.3	98.2	104.4
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.13	5.75	103.9	97.5	97.5	3/100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.09	8.96	116.5	114.9	114.9	119.4

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

2/Revised.

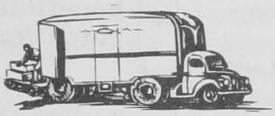
3/New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



Slightly lower prices this February for fresh haddock fillets (down 0.8 percent) at Boston and an 8.2-percent drop in prices for fresh shucked oysters at Norfolk caused a 1.2-percent decline from the previous month in the subgroup index for fresh processed fish and shellfish. Fresh shrimp prices at New York City were higher (up 5.8 percent) than in January but were below February 1963 by 18.4 percent. As compared with February 1963, prices this February were lower for most items in the subgroup and the index was down 11.3 percent. But prices for fresh haddock fillets were a marked exception--they were 43.2 percent higher this February than in the same month in 1963.

The February 1964 processed frozen fish and shellfish subgroup index dropped 2.0 percent from the previous month mainly because of a 4-cent-a-pound drop in wholesale prices for frozen shrimp at Chicago and lower prices for ocean perch fillets. Prices for frozen haddock fillets were up slightly from January to February and increased 6.7 percent from February a year earlier. The February 1964 subgroup index was down 14.2 percent from the same month in 1963 principally due to lower frozen shrimp prices (down 16.0 percent) at Chicago.

Wholesale prices for canned pink salmon in February 1964 were reduced by a leading Pacific Northwest packer and this resulted in a 2.6-percent decline from the previous month in the subgroup index for canned fishery products. Canned salmon prices this February were down 7.4 percent from a month earlier and were lower than February 1963 by 12.1 percent. From January to February prices were higher for canned Maine sardines (up 1.4 percent) as stocks declined, and canned California jack mackerel (up 6.6 percent). Compared with February 1963, the subgroup index this February was down 5.6 percent because of lower prices for nearly all canned fish items.



NEW SALMON HATCHERY TECHNIQUES

In their constant search for ways and means of increasing salmon production, biologists of the Fisheries Research Board of Canada in British Columbia are developing a new hatchery technique. They let the fish release themselves instead of releasing them in bulk when they are thought to be at the right stage for migration.

The Board's Biological Station at Nanaimo, B. C., has described experiments to test new techniques for rearing and release of pink salmon fry in hatcheries at Kleanza Creek on the Skeena River. The small fish have a tendency to hide themselves in daylight and move downstream at night, and the experiments have shown that when reared in darkness at temperatures close to those in nature, fry will release themselves from overflowing troughs at about the same time and stage of development as those at which they would emerge from gravel. Thus normal behavior patterns are not disturbed, and with higher survival of fry, the future runs of salmon may be increased.

The swimming speeds of adult salmon were the subject of another experiment by the Nanaimo station. Knowledge of what speeds the salmon can sustain is essential in the construction of fishways, and it was found that an adult sockeye can keep up a speed of two and one-half feet per second for 100 hours, but suffers fatigue at three feet per second. In one instance two salmon were still swimming after covering the equivalent of 175 miles in three and a half days. (Trade News, Canadian Department of Fisheries, February 1961.)