TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 16--
AN EXPLORATORY FISHING
AND GEAR RESEARCH BUOY:

A new unit has been developed and used aboard the exploratory fishing vessels Silver Bay and Oregon of the U. S. Bureau of Commercial Fisheries South Atlantic Exploratory Fishing and Gear Research Station, Brunswick, Ga., and the George M. Bowers of the Gear Research Station, Panama City, Fla.

MATERIALS AND APPROXIMATE COST LIST

Item	Qty	Unit	Unit Price	Total
			$	$
Pigtail socket	2	ea.	0.22	0.44
Conduit pipe	19	ft.	0.27	5.13
Wire from battery to light	20	ft.	0.02	0.40
Elbow, 45°	2	ea.	0.70	1.40
Styrofoam	7	ft.	0.52	3.64
Radar reflector (address: Vendo Company, Kansas City, Mo., Contract No. NU-6468)	1	ea.	3.50	3.50
Batteries, 6 V., lantern type	2	ea.	1.20	2.40
Cement, sakrete 1/ (50#)	½	bag	0.90	0.90
X-condulet, 1"	1	ea.	2.70	2.70
Plywood for box & shield	½	sheet	4.00	4.00
Pipe clamps, 1"	1	ea.	0.10	0.10
Brads for box	1	box	0.15	0.15
Clamp & screws	2	ea.	0.35	0.70
Tape	2	roll	1.15	2.30
Fluorescent paint	1	pt.	2.70	2.70
Total				30.46

1/Use of trade names is for identification only and does not imply endorsement of the company or product named.

The new unit meets the need for an inexpensive, reliable, and easily constructed fishing buoy and is adaptable to commercial use. The buoy is used to mark fishing gear in the water, to serve as a reference point for trawling, dredging, and gear research activities. Painted international orange, it has proved suitable for both day and night operations. CAUTION: Attempting to improve daylight visibility of the buoy through addition of a flag to the buoy top may create vibrations during operations which damage the light bulb filaments; however, use of such a flag is not considered necessary under normal operating conditions.

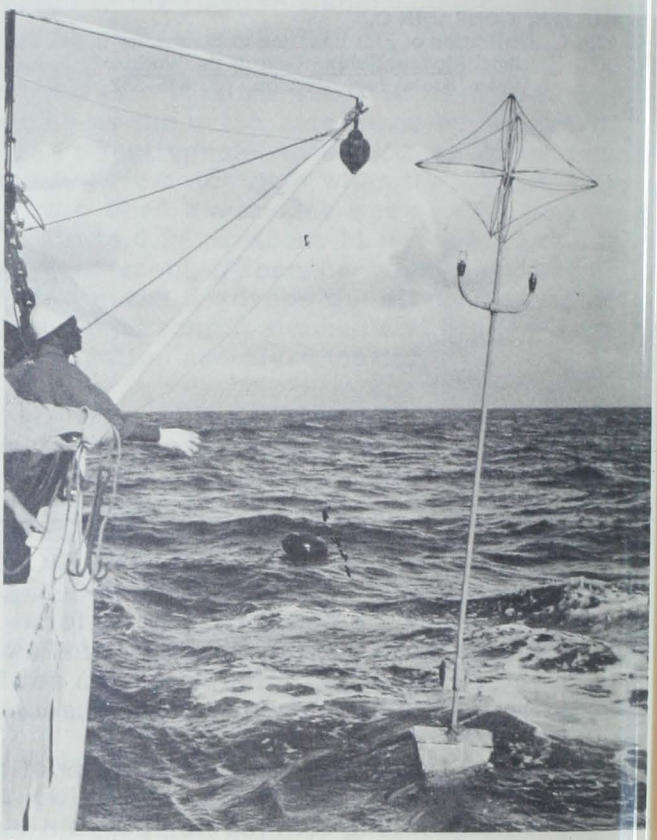

Fig. 1 - New type of exploratory fishing buoy used by Bureau of Commercial Fisheries exploratory fishing vessels to mark fishing gear in the water.

Basic features of the buoy include aluminum conduit, styrofoam flotation, two blinking lights, and fluorescent paint. Construction details are given in the accompanying diagram (fig. 2, page 13) and list of materials and cost.

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U. S. Bureau of Commercial Fisheries.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 735

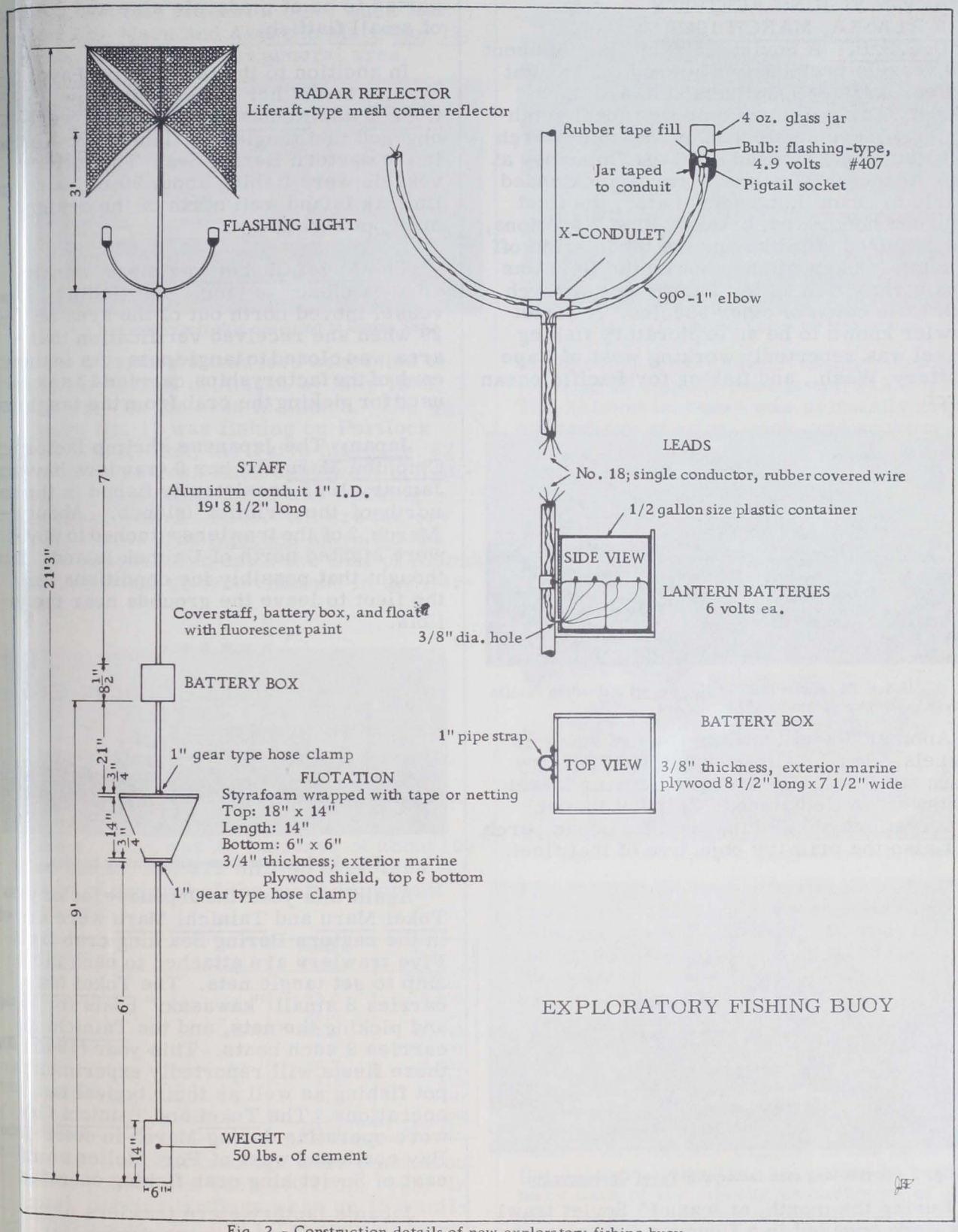


Fig. 2 - Construction details of new exploratory fishing buoy.

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, MARCH 1965:

U.S.S.R.: A Soviet trawling fleet of about 100 vessels previously centered off Yakutat in February 1965 shifted southward during March. Early in the month a gradual southeasterly movement began and by mid-March that fleet was centered off Cape Ommaney at the entrance of Chatham Strait and extended nearly to Dixon Entrance. Later, the fleet returned northward, breaking into 2 sections, one centered off Sitka and the other again off Yakutat. Observations showed the fleet was consistently fishing for Pacific ocean perch, with little catch of other species. A Soviet trawler known to be an exploratory fishing vessel was reportedly working west of Cape Flattery, Wash., and fishing for Pacific ocean perch.

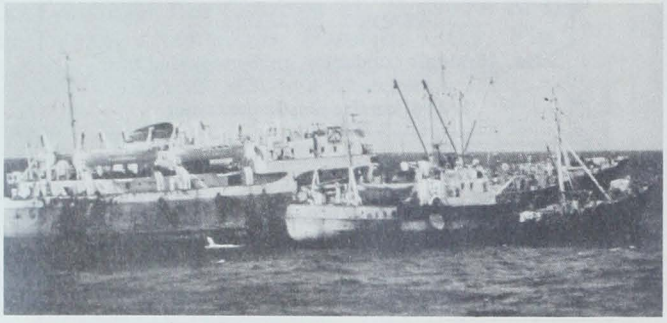


Fig. 1 - U.S.S.R. trawler (SRT-R Komandor) offloading Pacific ocean perch to reefer vessel in Bering Sea.

Another Soviet trawling fleet of about 15 vessels, including at least 9 BMRT factory stern trawlers, was operating during March southwest of Kodiak near Chirikof Island. Observations showed that Pacific ocean perch was also the primary objective of that fleet.

Fig. 2 - Soviet king crab factoryship Pavel Chebotnyagin.

During the month, at least 15 Soviet trawlers were engaged in a flounder fishery on the outer Bristol Bay flats some 20 miles n of Unimak Island. Their catches were r ported to be of moderate size and compo of small flatfish.

In addition to the factoryship Pavel C nyagin, two of her sister ships, the Alek Obukov and Konstantin Sukhanov, were a engaged in a tangle-net fishery for kind in the eastern Bering Sea. The latter tw vessels were fishing about 90 miles nor Unimak Island well north of the designat crab pot sanctuary.

The Pavel Chebotnyagin was working an area closed to tangle-net fishing. B vessel moved north out of the area on M 29 when she received verification that th area was closed to tangle nets. As in the each of the factoryships carried 12 small used for picking the crab from the tangle

Japan: The Japanese shrimp factory Chichibu Maru and her 9 trawlers have January 1965 consistently fished in the a north of the Pribilof Islands. About m March, 2 of the trawlers attached to that fl were sighted north of Unimak Island. It thought that possibly ice conditions force the fleet to leave the grounds near the P ilofs.

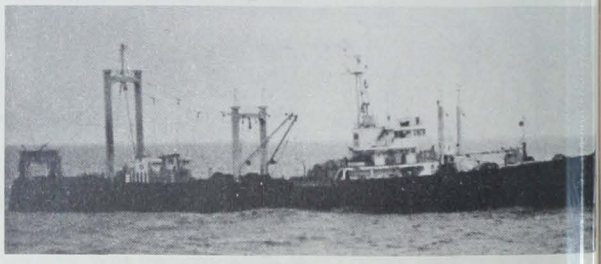


Fig. 3 - Japanese stern-ramp factory trawler.

Again this year the Japanese factorys Tokei Maru and Tainichi Maru were eng in the eastern Bering Sea king crab fish Five trawlers are attached to each facto ship to set tangle nets. The Tokei Maru carries 8 small "kawasaki" boats for ha and picking the nets, and the Tainichi Ma carries 9 such boats. This year (1965), those fleets will reportedly experiment pot fishing as well as their typical tangle operations. The Tokei and Tainichi flee were operating during March in outer Br Bay north and west of Port Moller some east of Soviet king crab fishing operation

Japan's factory stern trawlers Akebo Maru Nos. 53 and 71 were during March

rted northwest of Unimak Pass and were bably fishing for Pacific ocean perch. It believed that at least 2 other such trawl- the Aso Maru and Akebono Maru No. 72, e also working in that general area.

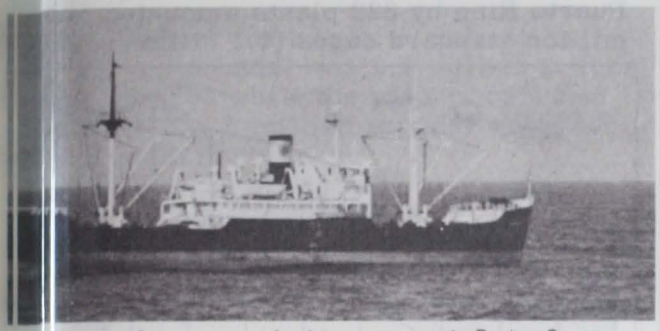


Fig. 4 - Japanese supply ship operating in Bering Sea.

the 4 Japanese trawlers scheduled to ate in the Gulf of Alaska by May 1965, 3 dy were in the area in March. The Dai- Maru No. 12 was fishing on Portlock east of Kodiak, the Taiyo Maru No. 82 on the Albatross Bank southwest of Kodi- and the Takachiko Maru was working west of Unimak Pass. All are factory trawlers. The Akebono Maru No. 53 also scheduled to enter the Gulf of Alaska arch but had so far remained in the Ber- Sea.

* * * * *

SKA FISHERY CATCH IMATES FOR 1964:

he 1964 commercial catch of fish and lfish in Alaska during 1964 amounted to 496 million pounds with an ex-vessel e of $58.4 million, according to prelimi- data of the Alaska Department of Fish Game. This was an increase of about 104 ion pounds and $12 million over 1963. lings of several of the more important es are:

Species	Million Pounds	Value
		$1,000
t	28.0	3,900
g	46.6	694
n	312.0	43,140
ness crab	12.7	1,400
rab	86.7	8,800
p	7.8	312
(shell weight)	0.1	10
	2.0	160
otal	495.9	$58,416

he 1964 halibut landings were down about llion pounds and $261,000 from 1963. In rast, herring landings were up 15.4 mil- pounds and $226,000. The increased her- catch resulted from the improved market

Fig. 1 - Gill-netter fishing for king salmon.

for herring meal and oil. Salmon landings were up 89 million pounds and $11.8 million. The salmon increase was primarily in greater landings of chum, pink, and sockeye.

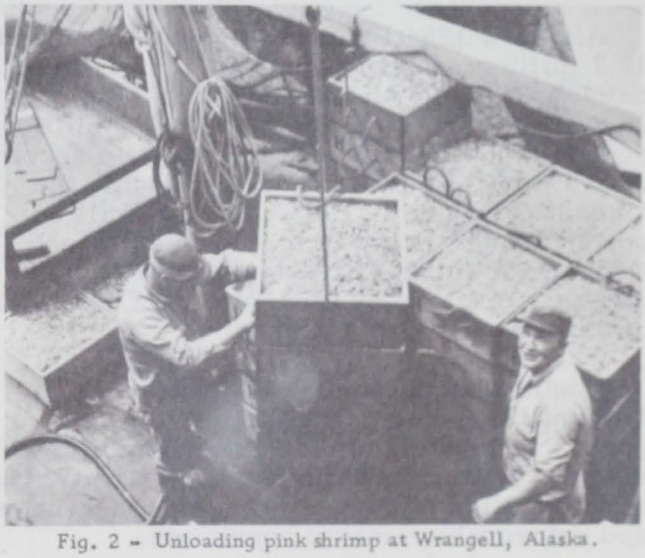


Fig. 2 - Unloading pink shrimp at Wrangell, Alaska.

The Dungeness crab catch was up 600,000 pounds and $43,000. King crab was up 8 million pounds and $1.2 million. Shrimp landings dropped 7.3 million pounds and $293,000. The clam catch was down 310,000 pounds and $42,000, a drop of over 75 percent from the previous year.

* * * * *

CRAB AND SHRIMP PRODUCTION, 1964:

Alaska's 1964 catches of king and Dungeness crab were the highest in the history of the Alaskan fisheries, according to preliminary data of the Alaska Department of Fish and Game. The king crab catch of 86.7 million pounds was more than 4.5 times the catch

of 5 years earlier and almost 10 times more than 10 years ago. The Aleutian Islands area was the highest producer of crabs in 1964 with a catch of 33.6 million pounds, or double the 1963 catch. The very large increase in that area is attributed to a number of factors, including the increased number of floating processors, the shift of some vessels to the area because of the loss of processing facilities in Kodiak because of tidal wave damage, and the natural growth of the fishery which has been in progress for several years.

Despite the March 1964 earthquake and seismic wave, the Kodiak area was the second highest king crab producer in 1964 with a catch of 29.6 million pounds. The Alaska Peninsula area followed with 15 million pounds and the Cook Inlet area with 6.9 million pounds. The Chignik, Prince William Sound, and Southeastern Alaska areas produced 1.6 million pounds.

Alaska's 1964 Dungeness crab landings of 12.7 million pounds topped the 1963 record catch by 600,000 pounds. Southeastern Alaska was the highest producer with 4.6 million pounds. The Kodiak area was a close second with 4.3 million pounds, almost double the amount produced in 1963. The 3.4 million pounds caught in the Prince William Sound-Copper and Bering Rivers area was 150,000 pounds more than in 1963, and the Cook Inlet catch totaled 400,000 pounds.

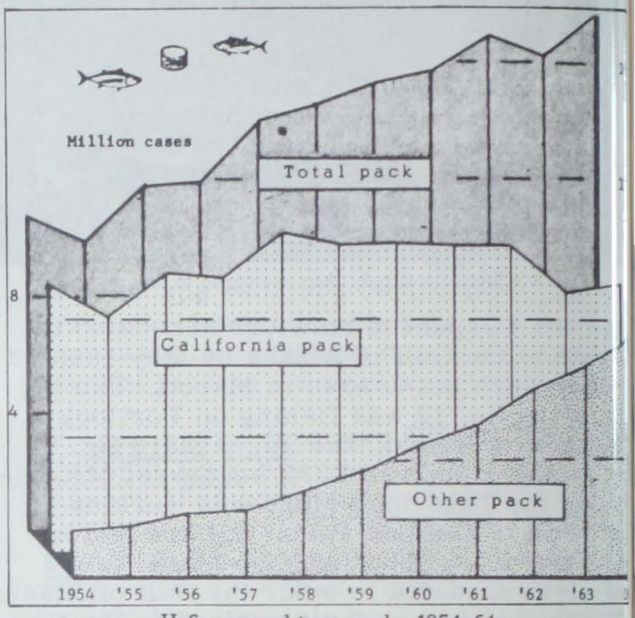
The Alaska shrimp catch dropped from 15.1 million pounds in 1963 to 7.8 million pounds in 1964. The lower 1964 shrimp landings were not due to a resource scarcity, but a combination of loss of processing facilities and unfavorable market conditions.

The Alaska Department of Fish and Game pointed out that the continued increase in shellfish production is of special significance to Alaska's economy. Fishermen received about $10.5 million for their 1964 landings and about another $10 million was paid to workers in processing the catch. Income from the growing year-round fishery industries is of vital importance to Alaska, and particularly its coastal communities, the Department's Commissioner stated.

Canned Fishery Products

U.S. PACK, 1964:

The 1964 pack of canned fishery produc in the United States, American Samoa, and Puerto Rico by 322 plants amounted to 35. million standard cases (1.1 billion pounds



U.S. canned tuna pack, 1954-64.

U.S. Pack of Canned Fishery Products, 1964

PRODUCT	NUMBER OF PLANTS	STANDARD CASES	POUNDS PER CASE	POUNDS	VALU
CANNED PRODUCTS:					
FOR HUMAN CONSUMPTION:					
SALMON	106	3,745,307	48	179,774,736	$94,05
SARDINES:					
MAINE	23	865,751	23.4	20,258,573	7,56
PACIFIC	7	120,850	45	5,436,250	1,02
TUNA:					
SOLID	32	4,519,398	21	94,907,358	61,01
CHUNKS	25	11,915,930	19.5	232,360,635	147,21
FLAKES AND GRATED	26	1,253,677	18	22,566,186	9,36
TOTAL	1/ 35	17,689,005	-	349,834,179	217,54
TUNALIKE FISH	5	24,674	21-19.5-18	466,743	17
ALEWIVES	8	74,581	45	3,356,145	30
MACKEREL	9	1,070,823	45	48,187,035	6,77
SHAD	5	1,235	45	55,575	
FISH CAKES (PRINCIPALLY GROUNDFISH)	3	60,372	48	2,897,856	
GEFILTEFISH	5	311,054	48	14,930,592	5,06
SALMON, SMOKED	34	1,940	48	88,320	1
STURGEON, SMOKED AND SPREADS	15	1,040	46	49,920	
TUNA SPECIALTIES:					
SMOKED, CREAMED AND SPREADS	7	8,213	48	394,224	
WITH NOODLES	3	48,341	48	2,320,368	
ANCHOVY PASTE	4	1,068	48	51,264	
MISCELLANEOUS FISH SPECIALTIES	23	110,380	48	5,298,240	
FISH ROE AND CAVIAR	24	64,042	48	3,074,016	
TOTAL FISH	-	24,199,476	-	536,519,236	339,
CRAB MEAT	30	292,314	19.5	5,700,123	
CRAB MEAT SPECIALTIES	10	16,459	48	790,032	
LOBSTER MEAT AND SPECIALTIES	6	15,197	48	729,456	
SHRIMP	39	649,332	15	2/ 9,739,980	12
SHRIMP SPECIALTIES	11	12,235	48	587,280	
CLAMS AND CLAM PRODUCTS:					
WHOLE	8	15,249	15	228,735	
MINCED	23	563,292	15	2/ 8,449,380	
CHOWDER	17	1,115,552	30	2/33,466,560	
JUICE	12	121,451	30	2/ 3,643,530	
TOTAL	1/ 41	1,915,544	-	2/45,788,205	14
CLAM SPECIALTIES	16	65,350	48	3,136,800	
CONCH MEAT	3	5,597	48	268,656	
OYSTERS	28	422,261	14	2/ 5,911,654	
OYSTER SPECIALTIES:					
SMOKED	7	307	48	14,736	
STEWS	6	113,169	48	5,432,112	
BISQUE AND SOUPS	7	2,650	48	127,200	
SQUID	9	214,649	48	10,303,152	
TURTLE MEAT, SOUPS AND STEWS	9	17,043	48	818,064	
MISCELLANEOUS SHELLFISH SPECIALTIES	9	13,327	48	639,696	
TOTAL SHELLFISH	-	3,655,434	-	89,987,146	46,
TOTAL FOR HUMAN CONSUMPTION	-	27,854,910	-	726,506,382	389,
BAIT AND ANIMAL FOOD:					
ANIMAL FOOD	56	7,341,670	48	352,400,160	43,47
SALMON EGGS FOR BAIT	9	21,906	48	1,051,488	2,16
TOTAL BAIT AND ANIMAL FOOD	1/ 65	7,363,576	-	353,451,648	45,63
GRAND TOTAL	1/322	35,218,486	-	1,079,958,030	430,96

1/ EXCLUSIVE OF DUPLICATION.

2/ DRAINED WEIGHT.

3/ "CUT OUT" OR "DRAINED" WEIGHTS OF CAN CONTENTS ARE GIVEN FOR WHOLE OR MINCED CLAMS, AND NET CAN CONTENTS FOR OTHER CLAM PRODUCTS.

NOTE: LISTS OF CANNERS OF FISHERY PRODUCTS BY INDIVIDUAL COMMODITIES MAY BE OBTAINED FROM THE OFFICE OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D.C. 20240.

ued at $431.0 million to the packers. Compared with 1963, the pack was up 648,000 cases and $9.4 million. The gain resulted mainly from a record pack of tuna and increases in the pack of salmon and animal food.

The 1964 pack for human consumption; (7.5 million pounds) was 2.4 million pounds less than in 1963 while the pack of bait and animal food (353.5 million pounds) was 46.5 million pounds more.

Cs--Shipments for Fishery Products, Jruary-February 1965

A total of 414,359 base boxes of steel and aluminum was consumed to make cans shipped by fish and shellfish canning plants in January-February 1965 as compared with 353,854 base boxes used during the same period in 1964.

Statistics cover all commercial and captive plants known producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel. (In the year 1964 tonnage data were based on the factor 23.5 base boxes per short ton of steel; and in the years 1962 and 1963 tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

Central Pacific Fisheries Investigations

SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 79 (February 10-March 10, 1965): To collect biological data on skipjack tuna (aku) and other related studies was the objective of this cruise by the research vessel Charles H. Gilbert operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The areas of operation were south and northwest of the Hawaiian Islands--Area 1 approximately 10°-12° N. and 149° W., and Area 2 between 24°-20° N. and 170°-158° W.

During the cruise, blood and serum samples of 70 skipjack and 5 yellowfin tuna were taken from fish landed from a single school successfully fished 8 miles northwest of Kaula Island. Also, large volume tuna whole blood samples were taken from 22 skipjack and 5 yellowfin tuna for use as standards in future reagent development studies by the Bureau's Honolulu Biological Laboratory.

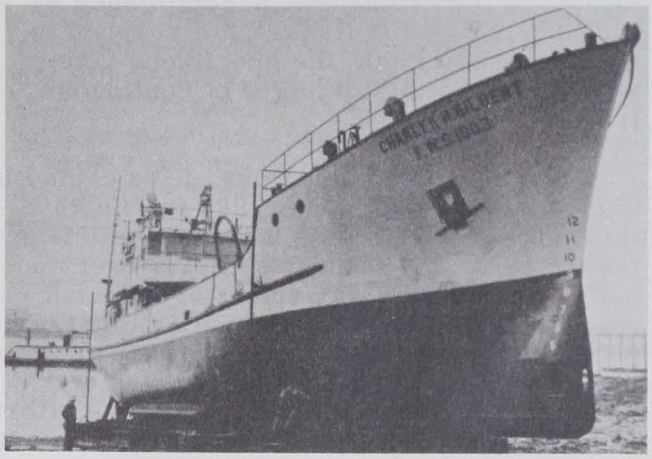


Fig. 1 - Charles H. Gilbert, research vessel of the U.S. Bureau of Commercial Fisheries. Note underwater observation chamber at the bottom of the bow end.

Measurements and sex determinations were made for the 70 skipjack and 5 yellowfin sampled from the school off Kaula Island. All of the fish were judged immature with the skipjack ranging from 43.1 to 57.9 centimeters (about 16.9 to 22.8 inches) and the yellowfin ranging from 66.7 to 75.9 centimeters (about 26 to 29.9 inches).

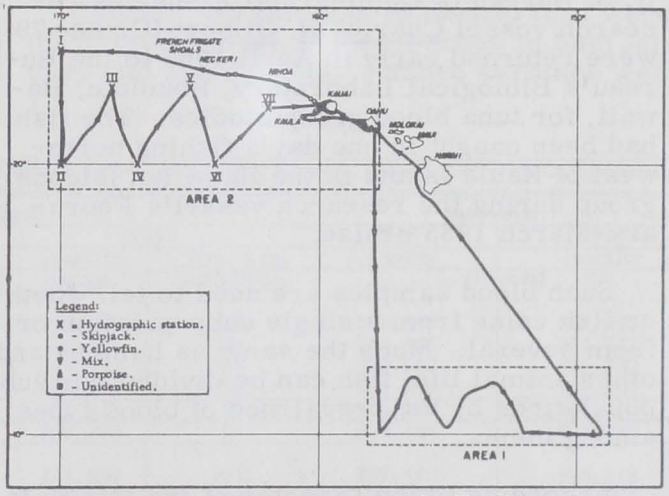


Fig. 2 - Shows area of operations of Charles H. Gilbert Cruise 79 (February 10-March 10, 1965).

Six skipjack schools, 2 yellowfin schools, 2 mixed schools (skipjack-yellowfin), 1 porpoise school, and 1 unidentified school were observed. Only one skipjack tuna school was observed and that was in Area 1. The other schools were spotted along the cruise track to the areas. The single successful fishing

effort of the cruise was accomplished by trolling. Since the fish did not respond to chumming attempts, the specimens taken were the results of 5 hours of continuous trolling.

Oceanographic operations of the cruise included making 270-meter (886 feet) bathythermograph (BT) casts and taking surface temperature and salinity samples every 3 hours while under way and after each successful fishing effort. Surface salinity samples, temperatures, and BT casts were also made every 3 hours while under way and following the single successful fishing effort, and standard weather observations were made.

Drift cards were released every 3 hours at BT stations while beyond 25 miles of land and hourly within 25 miles of land. Seven oceanographic stations were occupied, each involving a single 300-meter (984 feet) cast with 8 Nansen bottles placed at various depths.

A total of 5 yellowfin tuna and 2 little tuna were returned alive to the Honolulu Biological Laboratory for behavior studies.

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

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SKIPJACK TUNA BLOOD GROUP STUDIES:

Blood and serum samples taken from 70 skipjack and 5 yellowfin tuna caught by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert (Cruise 79) were returned early in April 1965 to the Bureau's Biological Laboratory, Honolulu, Hawaii, for tuna blood group studies. The fish had been caught in one day's fishing northwest of Kaula Island in the Hawaiian Islands group during the research vessel's February-March 1965 cruise.

Such blood samples are used to tell whether fish come from a single subpopulation or from several. Much the same as humans and other animal life, fish can be divided into subpopulations by the prevalence of blood types among them.

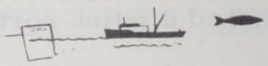
According to the Director of the Bureau's Honolulu Biological Laboratory, finding out how many subpopulations exist among the various fish species is more than an interesting intellectual puzzle. The skipjack tuna (aku) is by far Hawaii's most important commercial fishery. That same species of tuna is caught in great numbers off the west coast of North America. If that fishery were sharply stepped up, as has been suggested, wou the Hawaiian fishery decline? The answe lies in part in whether the fish all come f the same subpopulation.

The blood samples were taken to the T Blood Group Center at the Bureau's Labo tory's headquarters on the edge of the Un sity of Hawaii campus and analyzed. The reau scientists found that the skipjack tu caught by the research vessel came fro distinct subpopulation they are calling T Two, and that it seems to be found in Ha an waters throughout the year. Whether spawned and spends its life in those wate as yet unknown. Some skipjack tuna spa has been observed in Hawaiian waters, a has also been found near the Line Islands the Marquesas.

One scientific theory holds that the ski population is much like that of Honolulu. may consist of residents and visitors. Th very large skipjack landings during summ could reflect that fact. But so far, of the lion or more skipjack tuna landed in Hawa every year, the "last known residence" of two fish has been confirmed. Those were skipjack tagged off the coast of Baja Calif nia in 1960 and caught in Hawaiian waters 1962.

Cruise 79 of the research vessel Charl H. Gilbert is the first of several designed discover what subpopulations are in the lo waters at different times of the year. In planning that cruise, the scientists took a from the fishermen's book. Fishermen le bird flocks lead them to fish schools. Th reau's Honolulu Biological Laboratory dr on several years' records of bird flock si ings to lay out the cruise. Two areas we investigated during the cruise, one to the east of the Islands and the other to the no west. The first of those areas contains w of the California Current Extension, whic suspected of playing a large role in the in duction of skipjack tuna into the Hawaiian ery during the spring and summer. The s ond area has been known to have, during v ous times of the year, numerous skipjack schools. How the different types of water round Hawaii interact and how they respon the wind systems is the object of a major s at the Bureau's Honolulu Biological Labor ry, viz., the Trade Wind Zone Oceanograp Program.

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



Federal Purchases of Fishery Products

DEFENSE DEPARTMENT'S NEW INSPECTION REQUIREMENTS FOR FROZEN RAW BREADED FISH PORTIONS:

New inspection requirements, effective June 1, 1965, for frozen raw breaded fish portions purchased by the U. S. Department of Defense were announced in Headquarters Notice to the Trade No. 25 (65) of March 17, 1965, issued by the Defense Subsistence Supply Center, Chicago, Ill.

The new inspection requirements are contained in DSSC Articles 341 of June 1, 1965 (which replace DSSC Articles 341 of July 1, 1964) and will be cited in DSSC contracts for fish portions awarded on and after June 1, 1965.

Copies of the revised inspection requirements for fish portions may be obtained from regional offices of the Defense Subsistence Supply Center.

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DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MARCH 1965:

Fresh and Frozen: Purchases of fresh and frozen fishery products in March 1965 for the use of the Armed Forces were up 12 percent in quantity and 18 percent in value from the previous month. The increase was due mainly to larger purchases of higher-priced items such as shrimp, scallops, and haddock portions.

Compared with the same month in 1964, purchases in March 1965 were down 5 percent in quantity, but up 25 percent in value. Average prices for shrimp and scallop purchases in March 1965 were up sharply from March 1964, and prices for most fish fillet items were also higher.

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

QUANTITY				VALUE			
March		Jan.-Mar.		March		Jan.-Mar.	
1965	1964	1965	1964	1965	1964	1965	1964
(1,000 Lbs.)				($1,000)			
2,272	2,382	6,678	6,790	1,550	1,236	4,326	3,555

Total purchases in January-March 1965 were down 2 percent in quantity, but up 22 percent in value from those in the same period of 1964. Haddock portions were purchased in much larger quantity during the first quarter or 1965, but the increase was offset by smaller purchases of scallops, eastern oysters, flounder fillets, and haddock fillets.

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

Product	QUANTITY				VALUE			
	March		Jan.-Mar.		March		Jan.-Mar.	
	1965	1964	1965	1964	1965	1964	1965	1964
	(1,000)				($1,000)			
Tuna	1,548	529	2,189	1,457	650	236	941	644
Salmon	2	-	8	679	2	-	7	416
Sardine	35	19	146	79	20	8	89	30

Canned: Sizable lots of canned tuna were purchased for the Armed Forces in both January and March 1965. Canned sardines were

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

Product	March				Jan.-Mar.	
	1965		1964		1965	1964
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Quantity
	Pounds	Cents/Pound	Pounds	Cents/Pound	(Pounds)	
Shrimp:						
adless	92,400	98	99,150	79	276,800	282,050
and deveined	165,500	141	46,472	106	319,660	231,222
d	326,500	88	348,900	65	929,920	979,200
d and breaded	60,650	66	107,300	58	155,900	115,000
al shrimp	645,050	101	601,822	69	1,682,280	1,607,472
Scallops:	217,304	85	299,900	54	538,884	691,000
n	68,718	97	121,530	101	207,490	326,918
c	35,426	80	21,676	64	97,652	73,806
al oysters	104,144	91	143,206	95	305,142	400,724
Fillets:						
	41,520	36	22,700	34	156,270	127,246
dier	178,050	38	316,000	37	802,500	1,173,816
n perch	313,500	34	348,520	30	1,008,290	1,011,120
ock	183,550	37	217,650	32	455,550	569,244
k portions	188,504	47	-	-	498,054	8,650
Other:						
ut	113,770	51	112,500	37	322,420	307,025
on	18,250	64	25,735	67	32,740	49,302
fish	400	62	2,610	56	1,260	5,310

also purchased in moderate quantity during the first quarter of 1965.

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

(2) See Commercial Fisheries Review, May 1965 p. 17.

Fish Sticks and Portions

U. S. PRODUCTION, 1964:

The United States production of fish sticks and portions during 1964 amounted to 179.2 million pounds valued at $66.3 million--a gain of 3 percent in quantity and 1 percent in value as compared with 1963. Fish sticks totaled 73.5 million pounds in 1964--5.8 million pounds or 7 percent below 1963, and fish portions amounted to 105.6 million pounds--up 11.0 million pounds or 12 percent.

Table 1 - U. S. Production of Fish Sticks by Months and Type, 1964 1/

Month	Cooked	Uncooked	Total
	(1,000 Lbs.)		
January	6,709	517	7,226
February	6,595	467	7,062
March	6,417	548	6,965
April	5,468	403	5,871
May	5,251	406	5,657
June	3,700	521	4,221
July	3,398	407	3,805
August	5,675	630	6,305
September	5,944	533	6,477
October	6,683	343	7,026
November	5,749	398	6,147
December	6,221	549	6,770
Total quantity: 1964 1/	67,810	5,722	73,532
1963	74,137	5,165	79,302
	($1,000)		
Total value: 1964 1/	27,997	1,974	29,971
1963	29,734	1,856	31,590

1/Preliminary.

Table 2 - U.S. Production of Fish Sticks by Months, 1960-64

Month	1964	1963	1962	1961	1960
	(1,000 Lbs.)				
January	7,226	7,554	6,082	6,091	5,511
February	7,062	8,241	6,886	7,097	6,542
March	6,965	8,053	7,658	7,233	7,844
April	5,871	6,546	5,719	5,599	4,871
May	5,657	5,750	5,643	5,129	3,707
June	4,221	6,125	5,117	4,928	4,369
July	3,805	4,870	3,740	3,575	3,691
August	6,305	5,696	5,760	6,927	5,013
September	6,477	5,865	6,582	5,206	5,424
October	7,026	8,128	6,698	6,133	6,560
November	6,147	6,471	6,305	6,288	6,281
December	6,770	6,003	6,027	5,618	5,329
Total	73,532	79,302	72,217	69,824	65,142

1/Preliminary.

Table 3-U.S. Production of Fish Sticks by Areas, 1964 and 19

Area	1/1964		1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,00 Lbs
Atlantic Coast States	23	57,375	24	64,20
Inland & Gulf States	7	8,269	7	8,31
Pacific Coast States	12	7,888	13	6,78
Total	42	73,532	44	79,3

1/Preliminary.

Table 4-U.S. Production of Fish Portions by Months, 196

Month	Cooked	Breaded Uncooked	Total	Un-breaded	T
	(1,000 Lbs.)				
January	1,540	7,022	8,562	258	8,
February	1,742	6,279	8,021	420	8,
March	2,111	6,408	8,519	185	8,
April	1,950	5,905	7,855	105	7,
May	1,722	5,675	7,397	168	7,
June	1,219	6,227	7,446	169	7,
July	774	5,665	6,439	105	6,
August	1,711	7,375	9,086	255	9,
September	2,544	7,100	9,644	129	9,
October	2,033	8,739	10,772	293	11,
November	1,742	8,921	10,663	201	10,
December	1,868	6,819	8,687	253	8,
Total qty. 1964 1/	20,956	82,135	103,091	2,541	105,
Total qty. 1963	16,623	74,967	91,590	3,054	94,
	($1,000)				
Total value 1964 1/	8,667	26,712	35,379	910	36,
Total value 1963	6,846	26,099	32,945	1,035	33,

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Areas, 1964 and 1963

Area	1/1964		1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	26	63,955	27	53,211
Inland & Gulf States	9	38,981	10	38,222
Pacific Coast States	11	2,696	11	3,211
Total	46	105,632	48	94,644

1/Preliminary.

Table 6-U.S. Production of Fish Portions by Months, 1960-6

Month	1/1964	1963	1962	1961	196
	(1,000 Lbs.)				
January	8,820	8,173	5,077	4,303	3,
February	8,441	7,361	6,360	4,902	3,
March	8,704	8,835	7,036	5,831	4,
April	7,960	7,919	6,408	4,484	3,
May	7,565	7,293	5,818	3,879	3,
June	7,615	8,774	6,137	4,039	3,
July	6,544	4,524	4,679	3,962	4,
August	9,341	6,684	6,687	4,963	3,
September	9,773	9,621	7,180	5,745	4,
October	11,065	9,877	9,871	6,759	5,
November	10,864	8,136	7,406	5,789	4,
December	8,940	7,447	6,019	5,191	4,
Total	105,632	94,644	78,678	59,847	49,38

1/Preliminary.

Cooked fish sticks (67.8 million pounds) made up 92 percent of the 1964 fish stick total, while the remaining 5.7 million pounds or 8 percent consisted of raw fish sticks. A total of 103.1 million pounds of breaded fish

ppions (of which 82.1 million pounds were
r a and 2.5 million pounds of unbreaded por-
ttis were processed during 1964.

he Atlantic Coast was the principal area
iin e production of both fish sticks and fish
ppions with 57.4 and 64.0 million pounds,
r e ectively. The inland and Gulf States were
m e with 8.3 million pounds of fish sticks and
3 9 million pounds of fish portions. The Pa-
c i Coast States made up the remaining 10.5
m l n pounds of fish sticks and fish portions.

F Seals

P ES FOR ALASKA SKINS
A PRING 1965 AUCTION:

he spring auction in 1965 (April 8-9) of
U d States Government-owned fur seal
sk netted $1.67 million (does not include
wa of 2,237 sheared skins). The average
pr per skin received for 6,079 male fur
se skins (dyed Black, Kitovi, and Matara)
wr $116.36 and 7,650 female skins (dyed
Bl , Kitovi, and Matara) it was $89.21.

S g pelt from Alaska fur seal carcasses at killing field on
S l Island.

the fall 1964 auction, the average price
pp e kin (dyed Black, Kitovi, and Matara) for
m fur seal skins was $85.56 and for female
ss k it was $64.34. Of a total of 10,770 Black
ss k sold at the October 1964 auction, 7,971
w e male and the average price was $91.58 per
ss k 2,799 were female and the average price
f ose was $64.38 per skin. At the spring
1l S auction, the three colors of male skins
bo ght an average price of $105.45 per skin,
aa siderably higher average price than was
r ved at that year's fall auction.

The average price received for both male and female fur seal skins (dyed Black, Kitovi, and Matara) at this year's spring auction was $101.24 per skin. Lakoda (female sheared) seal skins brought an average price of $47.68 each, much less than the average of $59.65 received at the fall 1964 auction, and only slightly below the average of $48.82 received at the spring 1964 auction.

Average prices per skin received for processed male fur seal skins at the spring 1965 auction were: Black $121.23; Kitovi $92.81; and Matara $116.63. Average prices for both male and female dyed skins at this year's spring auction were (average for fall 1964 auction in parentheses): Black $104.03 ($84.51); Kitovi $83.91 ($62.49); Matara $101.86 ($75.89). At the spring 1964 auction the average prices for both male and female dyed skins were: Black $92.47, Kitovi $81.66, and Matara $91.58 per skin.

Note: See Commercial Fisheries Review, December 1964 p. 40; June 1964 p. 15.

Great Lakes Fishery Investigations

CHEMICAL TREATMENT OF SEA LAMPREY-PRODUCING STREAMS IN 1965:

Plans of the U. S. Bureau of Commercial Fisheries to treat 52 sea lamprey-producing streams in northern Michigan starting in spring 1965 through June 30, 1966, were approved this past April by the State of Michigan Conservation Department. A permit issued by Michigan's Conservation Director authorized that Federal agency to apply a selective sea lamprey-killing chemical under rigid safety standards in 20 Lake Superior streams and 32 tributaries of Lake Michigan.

The series of treatments were scheduled to get under way as soon as the run-off from melting snow ended, with stream work beginning in late April in the Lower Peninsula, and the season's first treatments above the Straits about early May. Stream conditions permitting, Stoney Creek in Oceana County was scheduled to be the first in the spring of 1964 to receive chemicals for eradicating sea lampreys. Otherwise, chemical treatment would be started farther south in Van Buren County.

Lake Superior streams on the chemical treatment list include: Gratiot and Little Gratiot Rivers in Keweenaw County; Three Mile Creek, Little Two Heart River, and Two Hearted River in

Luce County; Harlow Creek and Garlic and Little Garlic Rivers, in Marquette County; and Betsy River in Chippewa County; Sullivan Creek, Hurricane River, Miners River, Anna River, Five Mile Creek, Au Train River, Sucker River, Beaver Lake outlet, Rock River, Furnace Creek and Deer Lake outlet in Alger County.

This marks the first chemical treatment attack on sea lampreys in Gratiot and Hurricane Rivers. All of the other waters have been treated before, but stream studies show that sea lamprey populations have come back in them. The scientist in charge of the U. S. Bureau of Commercial Fisheries sea lamprey control program said, "Although re-treatment is necessary in these waters, there is no doubt in our minds that we have made a major breakthrough in controlling lamprey in Lake Superior streams. Lamprey catches at our electric barriers reveal that the predators' population has been reduced 80 percent during the last three years in the lake's treated tributaries." Even more significant to the total effort of restoring Lake Superior's fishery is the improvement in the survival and growth of lake trout, according to the scientist in charge of the program.

The following tributaries of Lake Michigan will also receive attention under the Michigan Conservation Department's latest permit for chemical treatment. They are Fishdam and Little Fishdam Rivers, Ogontz River, and Valentine Creek in Delta County; Milakokia River, Marblehead Creek, Deadhorse Creek, and Bursaw Creek in Schoolcraft County; Hudson Creek, Crow River, Hog Island Creek, Sucker Creek, Rock River, Cataract River, Swan Creek, and Point Patterson Creek in Mackinac County; Carp Lake River, Big Stone Creek, Big Sucker River, and Wycamp Outlet in Emmet County; White River and Norris Creek in Muskegon County; Black River and Brandywine Creek in Van Buren County; Porter Creek, Jordan River, Loeb Creek, McGeach Creek, Horton Creek, and Monroe Creek in Charlevoix County; Stoney Creek in Oceana County; and Grand River in Ottawa County.

Of the Lake Michigan tributaries, Little Fishdam River, Crow River, Carp Lake River, Wycamp outlet, White River, Norris Creek, Black River, Brandywine Creek, Monroe Creek, Stoney Creek, and Grand River would be treated for the first time. The remaining Lake Michigan streams will be phased into a four-year cycle of re-treatment which is geared to destroying reestablished sea la preys before they have a chance to becor parasitic. Normally those eel-like preda reach that stage in their fourth year. Th Bureau's scientist in charge of the progr reports that good gains have also been m in lowering sea lamprey numbers in trea Lake Michigan streams. If everything g according to schedule, the first round o treatment of Lake Michigan's lamprey str will be completed by the end of 1966.

With the progress of those efforts m so well, the decision has been made to p 1.3 million yearling lake trout in upper Michigan during summer 1965 to launch restocking program in those waters.

Under the scheduled timetable, the U. Bureau of Commercial Fisheries hope ter June 1966, to extend its chemical tre ment attack on sea lampreys to the Lake ron area, where 48 streams have been si gled out for treatment.

Note: See Commercial Fisheries Review, March 1965 p. 47 cember 1964 p. 42.

Gulf Fishery Investigations

Some of the highlights of studies cond by the U. S. Bureau of Commercial Fishe Biological Laboratory, Galveston, Tex., ing January-March 1965:

SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies: In an effort to determine optimum conditi for their growth, four diatoms, three flagellates, a three dinoflagellates, used as food for larval shri were each cultivated in 10 ml. of 9 different medi Periodic checks revealed that the degree of cell p plication varied with the species tested, but that organism produced the greatest number of cells Miquel's sea water with soil extract added; "NH" ficial medium proved second best. No growth wa served in sea-water controls.

The various media were also inoculated at diff time intervals to develop a schedule of reinoculat that would sustain vigorous cultures. Culture via differed greatly between species except that all c tures in Miquel's solution with soil extract maint good growth with weekly reinoculation

Examination of 103 Gulf-V plankton samples co lected in September and October 1963 revealed pla tonic-stage penaeids to be approximately three tim more abundant in the western (Galveston-Brownsv than in the eastern (Galveston-Mississippi River) tion of the sampling area. Overall abundance of th forms increased only slightly from that observed July and August.

Fig. 1 - Sampling postlarvae with a small beam trawl.

...nktonic stages of commercially-important shrimp (...Penaeus spp.) also were three times more abundant in ...stern sector than in the eastern, with only a slight ... increase in abundance from that observed dur... preceding 2 months. Greatest concentrations ...red at 15- and 25-fathom stations. The relatively ...cidence of nauplial and protozoeal stages indi... that spawning was intensive throughout the sam... area.

...rther attempts (November 1964-February 1965) ...te offshore bottom concentrations of Penaeus ...postlarvae moving into nursery areas were un...ssful. Sampling 5 to 8 inches above the bottom ...modified Clarke-Bumpus sampler attached to a ...esulted in large catches of postlarval and juve... Trachypeneus spp. and Sicyonia spp.

...alysis of fish samples collected during monthly ... survey cruises January-June 1964 was com... It shows that the catch of finfish per unit of ...ng effort at all depths was approximately 2 to ... greater off Louisiana than off Texas. In our ...consideration of questions about interrelation... of the Gulf's shrimp and demersal fish resources, ...inary analysis of 1962 trawl data has revealed ...depths of 15 and 25 fathoms off Louisiana catches ...spine porgies were 1½ times greater in all areas ...brown shrimp density (100 per 1-hr. tow) than in ...here brown shrimp were not as abundant. A sim... ...praisal of white shrimp and croaker catches in ...er waters indicated no comparable relationship.

...vation of Shrimp under Seminatural Conditions: ...oject was initiated the previous quarter. Its ob... are: (1) to determine the feasibility of cul... ...rimp under seminatural conditions; (2) to eval... importance of such factors as population den... ...edation, nature and abundance of food, dissolved ... nitrates, nitrites, ammonia, inorganic phos... ...hlorophyll, salinity, and temperature; and (3) ...blish the relative costs of building, operating, ...intaining culture ponds.

...ing of the pilot study's two ⅛-acre ponds at ...agoon began as the quarter came to a close. ...re to introduce approximately 9,000 postlarval ...shrimp into each. For comparative purposes, ...er in one pond will be changed continuously and ...mp it contains will be fed daily with a prepared ... the other, water will be added only to com... for that lost through evaporation, and its fer... ...nd pH will be adjusted so as to promote the ... of plankton for natural food.

Florida Bay Ecology Studies: Development of equipment for quantitatively sampling postlarval and juvenile pink shrimp in Florida Bay was continued. Results of testing a suction dredge, which employs the aspirator (or Venturi) principle, appear quite promising. In this method, an area of bottom is enclosed and the entrapped animals, plants, and substratum are lifted by the dredge directly onto graded sorting screens. No water passes through the pump in the process.

Because of this gear's limitations when it is employed to sample from enclosed areas, the suction head assembly was mounted on a sled, which permitted it to be towed over a known distance. In preliminary tests of the "sled's" sampling efficiency versus that of a small beam trawl sweeping an equal area, the sled-mounted suction device caught an average of 14 penaeid shrimp per square meter whereas the beam trawl captured less than 2.

As part of this study, marine plants and animals from the Florida Bay area are being collected, identified, and preserved or mounted for reference. One of the study's major objectives is to relate the role of associated plants and animals to the growth, survival, and distribution of pink shrimp.

Juvenile Phase of the Life History of the Pink Shrimp: Sampling in Buttonwood Canal to determine the cross-sectional distribution of migrating shrimp was conducted with 13 small conical nets (same mesh as channel net) set across the channel at various depths. Sampling proceeded during new-moon, full-moon, and (one) quarter-moon phases. Preliminary analysis of data collected July-December 1964 shows that shrimp tend to concentrate at the surface with less variation from catch to catch during full moon. These observations help to explain the marked differences in earlier abundance estimates derived from samples collected in wing nets without regard to moon phase.

Comparison of data obtained February and March (1965) revealed close agreement between the numbers of shrimp caught in wing and channel nets. If the remaining experimental work gives similarly favorable results, catches in wing nets alone will suffice to estimate the total number of shrimp moving through the canal during periods of full moon. (Conducted by University of Miami under a Bureau contract.)

SHRIMP DYNAMICS PROGRAM: Surveys of Postlarval Abundance and Fisheries for Bait (Juvenile) Shrimp: In contrast to their virtual absence in samples collected during past winters, postlarvae were caught regularly in limited numbers throughout the quarter at Aransas Inlet, Galveston Entrance, Rollover Pass, and Sabine Pass. The persistence of postlarvae at these sampling sites may have been related to above-average water temperatures this winter.

A special study at Rollover Pass in late March provided additional information on factors influencing the movement of postlarvae into nursery areas. Samples were taken hourly over three complete tidal cycles (72 hours) by means of a ½-m. plankton net fitted with a flow meter. One of the first samples, collected during a 2-minute tow, contained over 5,500 postlarval brown shrimp.

For the first winter since 1961, local sport fishing enthusiasts enjoyed an uninterrupted supply of bait shrimp.

Bait Shrimp Harvests from Galveston Bay System, 1959-1964					
Year	Production	Effort	Species Composition		
			White	Brown	Other
	Pounds	Hours	(Percent)		
1964	846,600	23,010	69	30	1
1963	994,640	29,120	61	39	1/
1962	1,062,900	33,610	57	43	"
1961	731,200	25,310	49	51	"
1960	943,400	16,030	59	41	"
1959	504,378	11,715	68	32	"

1/Less than 1 percent.

Migrations, Growth, and Mortality of Commercial Shrimp: A mark-recapture experiment with pink shrimp was initiated in mid-January on the Tortugas grounds off southwest Florida. The experiment's objectives are to secure information on: (1) patterns of pink shrimp dispersal over the fishing grounds; (2) shrimp growth rates during the period January-March; (3) estimates of natural and fishing mortality; and (4) a measure of the variation associated with estimates of natural mortality.

Approximately 12,000 distinctively stained shrimp of restricted size were released--3,000 in each of four areas--along the eastern margin of the Tortugas grounds. By the end of March, 48 percent of the marked shrimp had been recovered. Tests to determine the proportion of nondetected stained shrimp passing through processing plants were conducted at Key West and Marathon, Fla.

Population Studies: Two cruises scheduled to obtain additional information on the escapement of shrimp from fishing trawls were interrupted by poor weather during the quarter. Other project activities included analysis of data gathered during past cruises and preparation for future work. Some problems encountered in determining escapement from parts of shrimp trawls other than the cod-end have been successfully resolved by simultaneously towing three nets constructed with different-size webbing, and comparing the size frequencies of resulting catches. Similar experiments also permitted comparison of escapement from cod-ends without covering meshes. Findings yielded by both approaches suggest that significant losses of shrimp of commercial size occur when meshes larger than 2 inches are used in either the cod-end or body of shrimp trawls.

Seasonal Changes in Indices of Abundance of Postlarval Brown and White Shrimp in Vermilion Bay, La.: Work during the quarter was divided between processing samples of postlarvae collected during a 96-hour study at Marsh Island, and routine sampling in Vermilion and Cote Blanche Bays. Analyses of data gathered in both bays during 1963 and 1964 suggest a close relationship between the preseason density of postlarvae and the subsequent abundance of harvestable white shrimp. Peak densities of the two groups were separated by about a month, indicating relatively rapid shrimp growth. (Conducted by University of Southwestern Louisiana under a Bureau contract.)

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Only the Atlantic Croaker and the bay anchovy contributed significantly to trawl samples collected during the quarter. Since young-of-the-year croaker first entered the estuary last November, their numbers have steadily increased. Anchovy abunda on the other hand, has declined by more than 90 pe cent over approximately the same period. A smal number of white and brown shrimp remained in th tuary all winter. This phenomenon was not obser in past winters when freezing or near-freezing te atures effectively precluded the overwintering of s

Fig. 2 - Bringing a sample trawl in Galveston Bay on board the Tommy B 40-foot vessel used by the staff of the Galveston Fishery Biological Lab

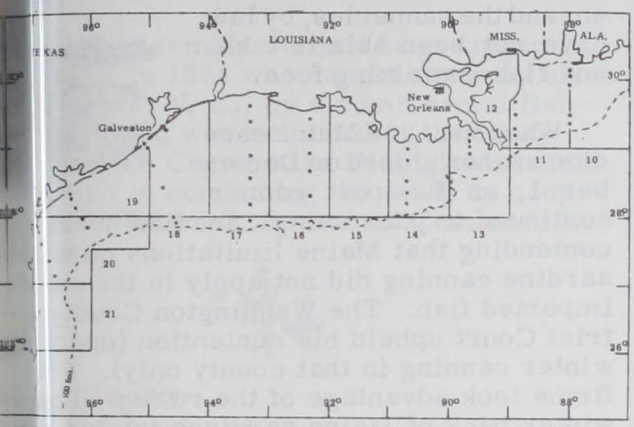
Postlarval brown shrimp were captured in the t passes throughout the winter. We therefore initia our brown shrimp survey in the estuary proper d the last week in January, earlier than originally p Postlarvae were present in East and Lower Galves Bays in late January but unfortunately adverse we conditions prevented sampling in the upper bays u the second week of February. Postlarvae then occ everywhere in the estuary except in Clear Lake an upper Trinity Bay. By late March, they were also ing caught in these areas.

We had previously observed that postlarvae gre very little when water temperatures remained belo about 20° C. (68° F.). Bay waters warmed to this by mid-March and significant postlarval growth wa evident by the end of the month. In contrast, postl did not enter the estuary during 1964 until late Fe ary and marked growth was not observed until mid April.

MOVEMENT OF POSTLARVAL SHRIMP FROM SHORE SPAWNING AREAS: The movement of pos larval shrimp into bays from offshore spawning a is an accepted feature of the Penaeus life cycle. distances involved coupled with the small size of t postlarvae has caused speculation as to whether th trip represents active or passive movements of th animals. Interest in this problem has led to labo measurements of postlarval swimming velocity. time required for individual brown shrimp postla to swim a known distance was used to estimate sp Assuming uninterrupted movement and ignoring e of water movement, we can extrapolate the data t miles per day. Further study will be required to mine the capacity of postlarvae to sustain these r and to test for the possible influence of environm factors on postlarval movement. At the moment, ever, it is interesting to note that field observati personnel of the Estuarine Porgram indicate an a age velocity of 2 miles per day for the movement brown shrimp postlarvae through Galveston Bay.

* * * * *

SHRIMP DISTRIBUTION STUDIES:
M/V "Gus III" Cruise GUS-27 (March 12-25, 1965): Small white shrimp counting 41-50 to the pound were caught at inshore stations in the up to 10-fathom depth range of 4 statistical areas worked during this cruise by the chartered research vessel Gus III. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., covered 8 statistical stations on the cruise, another of a series in a continuing Gulf of Mexico shrimp distribution stu



...n pattern for shrimp distribution studies by M/V Gus III, ...e GUS-27.

...total of 25 standard 3-hour tows with a ...ot flat trawl was made. The vessel also ...a 55 plankton tows, and 42 bathythermo... (BT) and 167 water (Nansen bottle) ... Bottom core samples were obtained ...eastern stations in depths ranging from ...40 fathoms.

...tches of brown shrimp were generally ...in all areas, with the largest catch of ...nds (26-30 count) from the 11-20 fath... ...epth of area 18. That area also yielded ...nds of 15-20 count brown shrimp from ...er 21-fathom depth, and 16 pounds of white shrimp (41-50 count) from the up ...athom depth. Area 19 yielded 12 pounds ...0 count brown shrimp from the 11-20 fathom depth, in addition to small white shrimp (15 pounds of 41-50 count) caught in the up to 10-fathom depth.

A tow in the 11-20 fathom depth of area 13 yielded 12 pounds of white 15-20 count shrimp, and only 2 pounds of the same size were caught in area 16 from the up to 10-fathom depth.

Area 20 yielded some 25 pounds of white and brown shrimp ranging from 15-20 count down to 51-67 count. The largest catch from that area was 9 pounds of 26-30 count brown shrimp from the over 21-fathom depth.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, May 1965 p. 22.

Industrial Fishery Products

U. S. PRODUCTION, 1964:
The production of industrial fishery products in the United States, American Samoa, and Puerto Rico in 1964 by 160 plants was

Menhaden vessel docked at a fishery industrial products plant in Empire, La.

U.S. Industrial Fishery Products Production, 1964

...ucts	Number of Plants	Unit	Quantity	Value
...nimal scrap and meal	109	Tons	235,252	$27,944,858
...nimal oils:				
...	74	1,000 lbs.	180,175	13,272,991
...	2	"	23	24,000
...les	36	Tons	93,296	5,662,194
...earl shell buttons	6	Gross	406,917	1,004,344
...ell buttons	7	"	226,625	272,281
...ell grit and lime ("Live and reef shells")	14	Tons	362,543	4,914,924
...eous industrial products	22	-	-	16,551,404
...tal	1/ 160	-	-	69,646,996

1/ ...ve of duplication.

valued at $69.6 million--an increase of $1 million as compared with 1963.

The 1964 production of 235,252 tons of fish meal and scrap was 8 percent less than the 255,907 tons produced in 1963, while marine-animal oils (180 million pounds) was 3 percent less, and fish solubles (93,296 tons) declined 7 percent. Other industrial products (agar-agar, kelp extracts, liquid fertilizer, mussel-shell dust and chips, animal feeds, fertilizers, etc.) accounted for the increase in the total value of industrial products in 1964.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES PRODUCTION, MARCH 1965:

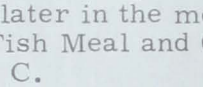
Preliminary data on U. S. production of fish meal, oil, and solubles for March 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

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

Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
March 1965:			
East & Gulf Coasts	837	200	40
West Coast 2/	1,921	342	1,048
Total	2,758	542	1,088
Jan.-Mar. 1965 Total	7,157	1,664	2,337
Jan.-Mar. 1964 Total	5,787	1,465	2,793

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

As usual, complete details on United States production of industrial products will appear several weeks later in the monthly statistical publication "Fish Meal and Oil," issued from Washington, D. C.



Maine Sardines

YEAR-ROUND CANNING SEASON APPROVED:

A bill has been passed by the Maine Legislature and signed into law by the Governor to legalize the taking of herring for canning purposes from the coastal waters of Maine on a year-round basis. The new law becomes effective 90 days after the adjournment of the Maine legislature which means it should be in effect before 1966.

For many years the legal season in M for taking herring for canning has been f April 15 to December 1, but temporary e ceptions were made on an emergency bas for 3 years during World War II, and in 1 62 when there was a serious fish shortag

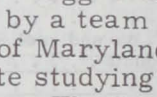
Winter canning of Maine sardines has costly, and the winter packs have been lim by cold weather, gales, and generally ad conditions. Purse seining has been the only method by which the fish could be taken; and the canneries, by law, have not been able to take any fish containing feed.

When the 1964 Maine sardine season closed on December 1, an Eastport canner continued to pack using Canadian herrin contending that Maine limitations on win sardine canning did not apply in the case imported fish. The Washington County D trict Court upheld his contention (opening winter canning in that county only). Four firms took advantage of the ruling. Thei winter pack of Maine sardines totaled ab 40,000 cases as of April 15, 1965. On th other hand, winter canning with imported was barred by a Maine court in Hancock Co

The new legislation will open winter s dine canning to all Maine plants and will low winter canning with domestic as well imported herring.

The regular 1965 Maine sardine canni season is expected to produce a normal p of 1,500,000 to 1,600,000 cases. A total 23 Maine sardine plants was expected to operate in 1965, and volume production w expected to begin in late May or June.

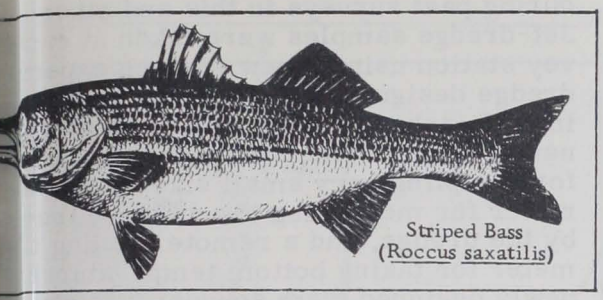
Note: See Commercial Fisheries Review, April 1965 p. 2



Maryland

STRIPED BASS TAGGED IN SPAWNING AND MIGRATION STUDY:

In April 1965, nearly 2 tons of striped or rockfish were tagged and released in t Patuxent River by a team of scientists fr the University of Maryland's Natural Re sources Institute studying their spawning migration habits. The Institute is also c ducting a pollution study on the Patuxent



Striped Bass
(Roccus saxatilis)

hich is one of the most important striped
spawning grounds.

4-pound female striped bass tagged in
tuxent in 1964 was caught recently off
Hatteras, N. C., by a commercial fish-
n. The tag was returned to the Mary-
stitute's Chesapeake Biological Labor-
, which is conducting the study in coop-
n with the U. S. Bureau of Commercial
ries.

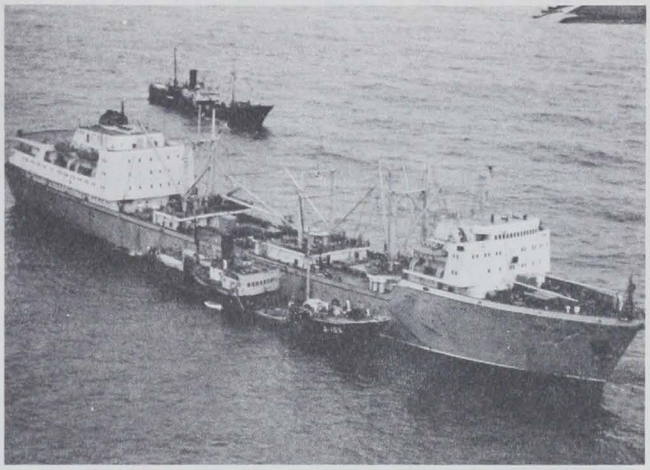
th Atlantic

T FISHING ACTIVITY
COAST, APRIL 1965:

ere was a continual increase in Soviet
g activity in the North Atlantic during
1965. These observations were made
staff of the Fisheries Resource Man-
nt Office, U. S. Bureau of Commercial
ries, Gloucester, Mass., which has been
ting weekly reconnaissance flights co-
ively with the U. S. Coast Guard. A to-
107 vessels were sighted and identified
factoryship stern trawlers, 44 refrig-
and nonrefrigerated side trawlers, 9
sing and refrigerated fish transports,
uel and water carrier. This compared
vessels sighted in March 1965 and 64
observed in April a year earlier.
reased number of Soviet vessels dur-
il was attributed mainly to the arrival
s and SRT-R's which had not been seen
bers since they left Georges Bank in
ber 1964.

ing operations of the Soviet vessels
ly ranged from south of Montauk Point,
s land (Hudson Canyon), along the 100-
curve of the Continental Shelf to south
theast of the Nantucket lightship (Veatch
to Lydonia Canyon).

All of the Soviet vessels observed during April were actively engaged in fishing operations and had substantial quantities of fish on deck. Those vessels fishing south of Long Island and Nantucket Shoals were catching primarily red hake and smaller amounts of whiting. It was noted that the Soviet fleet extended its operations to include the southwest part of Georges Bank and appeared to be taking considerable amounts of both herring and whiting.



Soviet processing and refrigerated factoryship Matochkin Shar. Smaller vessels standing by are Soviet trawlers of the Pioneer class. Photo was taken in April 1965, about 60 miles south of Nantucket Island.

A reconnaissance flight was made along the Middle Atlantic coast area during the month where 3 Soviet factoryship stern trawlers were sighted and identified 90 miles east of Cape May, N. J. Each of those 3 vessels had substantial amounts of fish on deck but the species were not identified.

Soviet fishing activity along the Middle Atlantic coast as of April did not develop to the extent that it did in 1964. The species of fish in that area have apparently not been found in sufficient quantity to warrant any major deployment of vessels from the fishing grounds where good catches of red hake, whiting, and herring were being made.

Note: See Commercial Fisheries Review, May 1965 p. 24.

North Atlantic Fisheries Explorations and Gear Development

SURF CLAM SURVEY CONTINUED:

M/V "Delaware" Cruise 65-2 (February 19-March 18, 1965): This cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware off the coast of Maryland and Virginia was a continuation of an Atlantic surf clam survey conducted during the summers of 1963 and 1964. The survey was initiated in cooperation with the Sea Clam Packers Committee of the Oyster Institute of North America.

Fig. 1 - Sample of surf clams from one of the tows made aboard the M/V Delaware during Cruise 65-2. The sample shows the size range of the clams. The longest measured six inches in length, the smallest measured two inches.

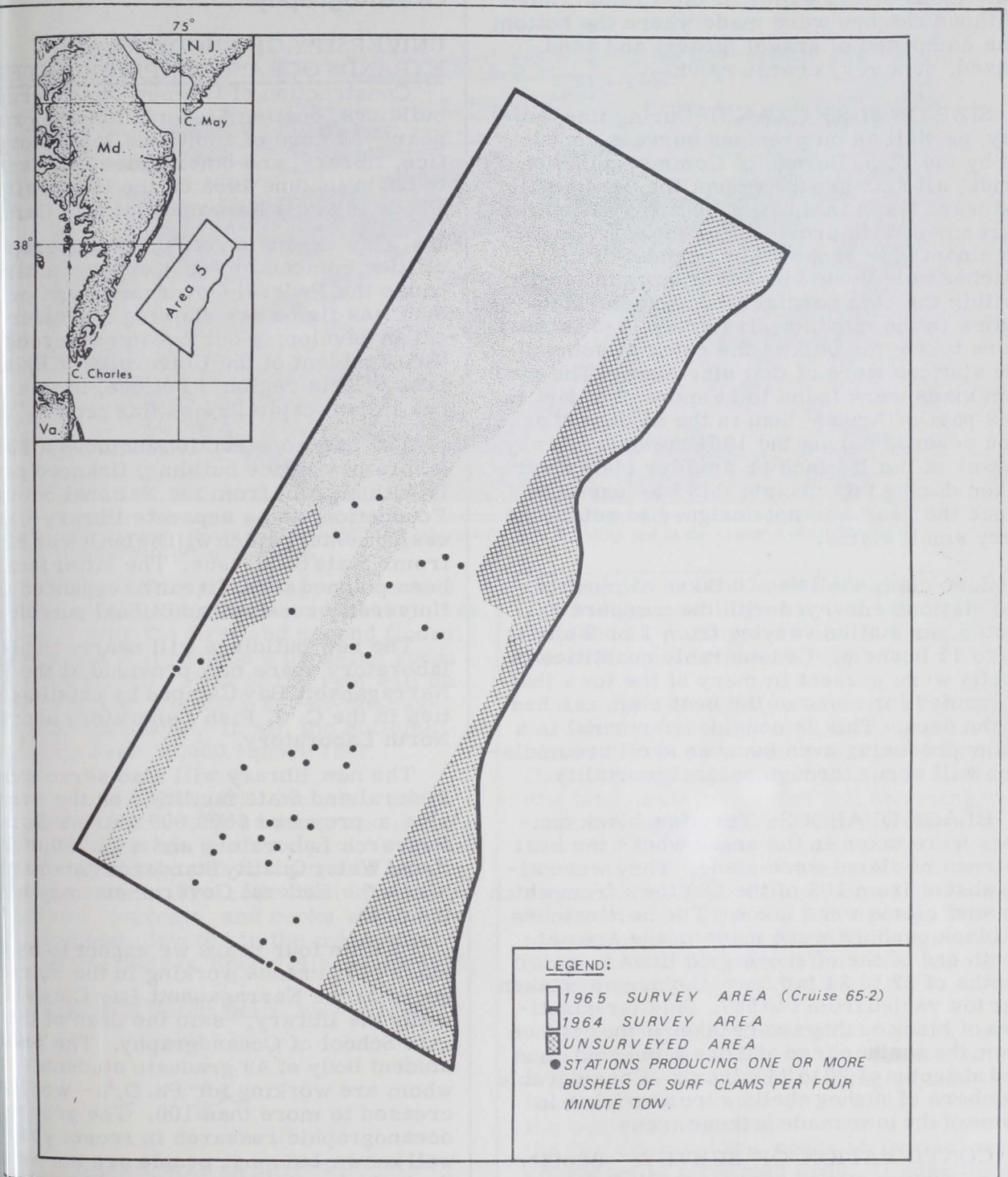
Objective of Delaware Cruise 65-2 was to survey as much as possible of the remaining unsurveyed section of Surf Clam Area V. Clam explorations in that area had been previously conducted during June-July 1964 by the Bureau's research vessel Rorqual. During this 4-week cruise, commercially usable concentrations of surf clams were found at many of the sampling stations in Survey Area V.

SURVEY PROCEDURE: The same survey procedure was followed during this cruise as during past surveys in this and other a Jet-dredge samples were taken at each vey station using a new 48-inch experi dredge designed to retain all clams exc ing 1.5 inches long. Special features o new dredge include a retainer compart for sampling very small size clams, a meter for measuring the distance trave by the dredge, and a remote reading th meter for taking bottom temperatures newly designed clam sounder was atta to the dredge but the unit became inop during the early part of the cruise and information was obtained from its use water meter was installed in the main line to measure the amount of water fl to the dredge jets from the pump. Rea obtained from the meter showed a ma flow of 1800 gallons per minute was s to the dredge jets at pressures of 70 t pounds per square inch during normal ation.

Survey operations were started on g line number one (which formed the wes boundary of the area) and proceeded fr that line seaward and northward to the tion where the 1964 survey was termin Clam dredge tows were at one-mile int along a "grid" of loran lines spaced 1 apart. Because of unfavorable bottom tions, grid line No. 3 and the upper end some of the other grid lines were bypa during the survey.

SURF CLAM CATCHES: Of the 400 tions surveyed during the cruise, 270 c yielded surf clams varying in abundanc 1 clam to 5.7 bushels per 4-minute tow tows yielded no surf clams. A total of stations yielded one or more bushels p Many catches of slightly less than one were also made, usually from areas a to the locations of the better catches.

Generally, the inshore and offshore tions of the area surveyed produced th est catches of clams while the central tion yielded the better catches. The c sition of the bottom in much of the ins area is largely of mud, clay, mud and together, or soft silt, with very little s or gravel. As expected from the resul past surveys, the deeper offshore secti produced few large catches. A large p of the bottom of that section was found very hard and very unproductive. It w impossible to get the blade of the dred dig more than 2 to 3 inches into the ha



-Shows survey status of Surf Clam Area 5 and producing stations during M/V Delaware cruise 65-2 (February 19-March 18, 1965).

most of that deeper section. But a few atches were made in depths of up to 24 s where tows were made on gravel s. It is possible that some surf clams e found in still deeper offshore waters, able bottom can be found there.

Of the 34 tows made which yielded 1 or more bushels per tow, the 3 best catches occurred where the depth of water was 17 fathoms (102 feet). The depth range for the 34 samples was from 14 to 22 fathoms. The maximum of that range represents the greatest depth where good populations of clams

were found up to the time of this cruise. Most of those catches were made where the bottom was composed of gravel, gravel and sand mixed, or a very coarse sand.

SIZE OF SURF CLAMS: During this survey, as well as on previous surveys conducted by the U. S. Bureau of Commercial Fisheries, all size groups except the very smallest were taken in most of the tows. Also in agreement with previous findings, the predominant size group taken in most of the catches were those 5 inches or more in length (within the commercial size-range). Many clams in the medium-size group (3-5 inches) were taken; the bulk of the catch at some of the stations were of that size clam. The medium sizes were found to be more abundant in this part of Area V than in the northwest section covered during the 1964 summer survey. Fewer of the 1.5-inch or smaller clams were taken during this cruise; this was expected since the gear was not designed to retain the very small clams.

Surf-clam shells were taken at most of the stations surveyed with the numbers collected per station varying from 1 or 2 shells up to 12 bushels. Considerable quantities of shells were present in many of the tows that accounted for some of the best clam catches in the area. This is considered normal in a clam-producing area because shell accumulation will occur through natural mortality.

BLACK QUAHOGS: Very few black quahogs were taken in the areas where the best catches of clams were made. They were also absent from 108 of the 130 tows from which no surf clams were taken. The best catches of black quahogs were made in the area at north end of the offshore grid lines in water depths of 22 to 24 fathoms; the numbers taken per tow varied from 1 to 567. Smaller quantities of black quahogs were taken in the catches from the southern end of those same grid lines and at depths of 20 to 24 fathoms. Considerable numbers of quahog shells were also taken in some of the tows made in those areas.

CONTINUATION OF SURVEY: Another clam survey cruise of the vessel Delaware was scheduled for May-June 1965. A third cruise is planned for October 12 to November 10, 1965.

Note: See Commercial Fisheries Review, November 1964 p. 41.

Oceanography

UNIVERSITY OF RHODE ISLAND EXPANDS OCEANOGRAPHIC CENTE

Construction of two new oceanogra buildings, costing $1.2 million and pr nearly an acre of additional laborato fice, library, and other space, was s to begin in June 1965 on the Universi Rhode Island's Narragansett Bay Cam

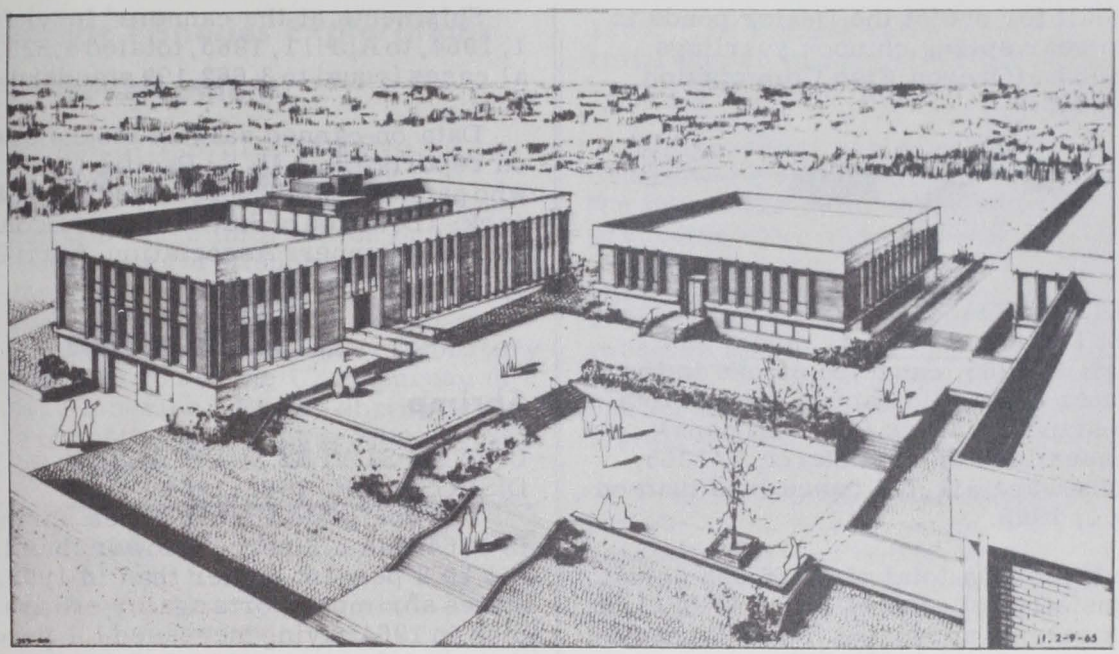
"This expansion of our oceanograp cilities comes at a most opportune ti cause the Federal Government and pri business firms are showing a greate est in developing our ocean resource the president of the University of Rho land. "This region, I believe, is in a position to capitalize on this growth,"

The new construction includes a $9 laboratory-office building, financed pr ly with a grant from the National Scie Foundation, and a separate library-da essing center, which will be built with $2 from a State bond issue. The latter faci been planned so that it can be expanded i University receives additional outside

The new buildings will nearly triple laboratory space now provided at the Narragansett Bay Campus by existing ties in the C. J. Fish Laboratory and North Laboratory.

The new library will also serve exi Federal and State facilities on the cam plus a proposed $500,000 Marine Ga Research Laboratory and a $1,750,00 tional Water Quality Standards Laborat which the Federal Government may b the area.

"Within four years we expect to ha least 400 persons working in the mar ences at the Narragansett Bay Campus using the library," said the dean of the uate School of Oceanography. The pr student body of 49 graduate students-- whom are working for Ph. D.'s--woul creased to more than 100. The growth oceanographic research in recent yea well known, but most people are not aw the lack of well trained personnel in this the dean explained. "However, this la generally agreed to be the limiting fac our national program of expanded ocea graphic research. Since the Universit Rhode Island is one of only six univers that trains scientists in all aspects of graphy, I believe our expansion will cont to help overcome this shortage," he ad



Architect's drawing of two new buildings to be constructed on the University of Rhode Island's Narragansett Bay Campus. On the left is the $950,000 laboratory-office building and in the center is the $250,000 library-data processing center.

he new laboratory building will contain ffices and 22 air-conditioned laboratories, ributed over the first and second floors. basement will include a dressing room SCUBA divers. Part of the roof will be ed over with wood for out-of-door ex- rmental apparatus. In all, the building contain over 30,000 square feet.

he 2-story library will include a large re hall, conference-seminar rooms, of- , a photographic laboratory, work areas, nputer facility, and drafting and data essing areas. The collection of scientif- erature, journals, and books will be a ialized one, devoted to the marine sci- s. (University of Rhode Island, April 15, .)

See Commercial Fisheries Review, July 1964 p. 25.

gon

NG CHINOOK SALMON NTINGS INCREASE IN WILLAMETTE RIVER:

he Oregon Fish Commission's new mul- -use policy for its Dexter holding ponds ed an additional 750,000 yearling chinook on for planting in the Middle Willamette r in the spring of 1965 (in addition to l hatchery plantings of 3 million spring chinook in the Middle Willamette). When planted the yearling salmon from Dexter weighed 12 to the pound and measured between 6 and 7 inches in length.

The Dexter facility was originally designed to collect and hold adult spring chinook blocked from upstream passage by Dexter Dam. Spring chinook which arrive in April and May, well before the fall spawning period, move up the fishway immediately below Dexter Dam and are trapped in the holding ponds where they are retained until their eggs mature in September or early October. When they are ripe the fish are spawned by hatcherymen and the fertilized eggs transported to the Willamete Hatchery for incubation and rearing of the fry.

During both 1963 and 1964, spring chinook egg takes at facilities in the Willamette system have exceeded the rearing capacity of the hatcheries there. In an effort to make the best possible use of surplus fry, one of the two adult holding ponds at Dexter was converted to a rearing pond. (Under present operations, only one of the ponds is needed to hold adult fish through the summer.) Use of the pond, which measures 40 by 200 feet, raised Oregon hatchery production of yearling spring chinook on the Middle Willamette by 25 percent from 3 million to 3.75 million during the past season at a relatively low additional cost.

Plans call for one of the Dexter ponds to be used to rear spring chinook yearlings again in 1965. (Oregon Fish Commission, April 15, 1965.)

Salmon

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

On April 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 1,435,745 standard cases (48 1-lb. cans), 530,442 cases less than on March 1, 1965, when stocks were 511,774 cases less than on February 1, 1965.

On the basis of a total of 1,726,858 actual cases (consisting of cans of $\frac{1}{4}$-lb., $\frac{1}{2}$-lb., 1-lb., etc.), pink salmon accounted for 49.2 percent (849,663 cases of which 676,562 cases were 1-lb. talls) of the total canners' stocks on April 1, 1965. Next came chum (428,803 cases, mostly 1-lb. talls), followed by red (299,277 cases). The remainder of about 8.6 percent was coho (silver) and king salmon. Nearly 80 percent of the pink salmon stocks on hand was packed in 48 1-lb. cans, and the balance mostly in 48 $\frac{1}{2}$-lb. cans.

Total Canners' Stocks of Pacific Canned Salmon, April 1, 1965

Species	Apr. 1, 1965	Mar. 1, 1965	Feb. 1, 1965
	(No. of Actual Cases)		
King	46,882	63,915	79,834
Red	299,277	411,505	511,299
Coho	102,233	128,589	146,885
Pink	849,663	1,201,716	1,550,541
Chum	428,803	536,529	648,041
Total	1,726,858	2,342,254	2,936,600

From March 1 to April 1, 1965, pink salmon stocks were lower by 352,053 actual cases (1-lb. talls lower by 300,953 cases), reds were down 112,228 cases, and chums were down 107,726 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments at the canners' level from 1, 1964, to April 1, 1965, totaled 4,623,018 a al cases (equal to 3,662,199 standard case

Data on canned salmon stocks are bas on reports from U. S. Pacific Coast can who packed over 98 percent of the 1964 sal pack. (Division of Statistics and Economic National Canners Association, April 24, 19

Shrimp

UNITED STATES SUPPLY AND DISPOSITION, 1962-1964:

The available United States shrimp s in 1964 was 5.6 percent lower than in 1 but 10.2 percent higher than in 1962. U States shrimp imports again were at a re high in 1964 having increased 1.1 percen the previous year and 10.9 percent from 1

U. S. Supply and Disposition of Shrimp, 1962-196

Item	1/1964	2/1963	
	(1,000 Lbs., Shell-on		
Supply--Heads-on weight:			
Domestic landings	208,400	240,478	
Foreign product of U.S. fisheries 3/	954	253	
Imports 4/	269,113	266,205	
Total supply (heads-on)	478,467	506,936	
Disposition--Heads-on weight (approximate):			
Frozen:			
Headless	6/	283,271	
Meat, raw (includes some cooked) 5/	6/	109,703	
Meat, cooked 5/	6/	15,232	
Breaded	91,208	76,700	
Specialties	6/	1,020	
Total frozen 7/	389,632	398,978	
Canned	43,057	68,272	
Sun-dried	4,568	5,640	
Fresh	25,000	27,000	
Unclassified	16,210	7,046	

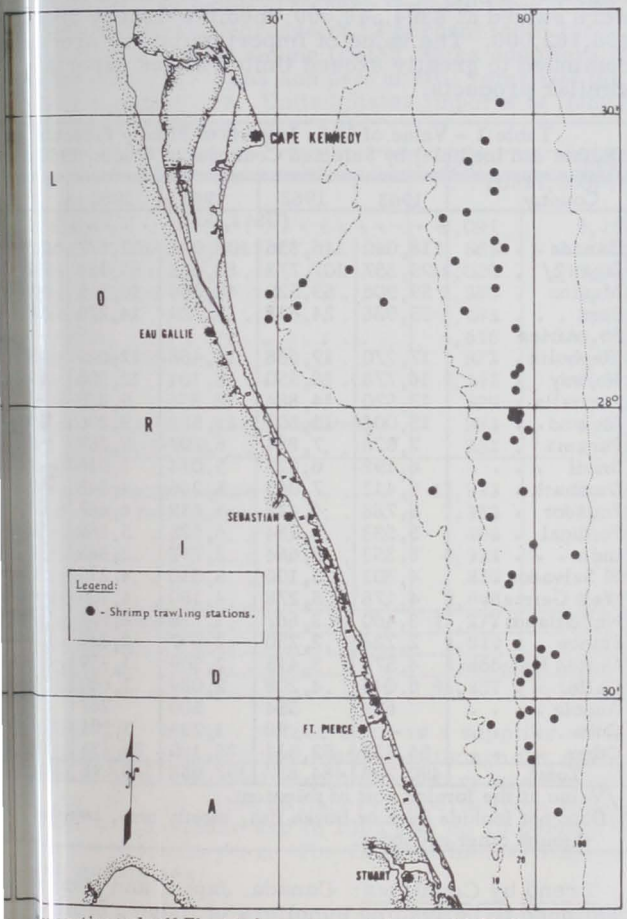
1/Preliminary.
2/Revised.
3/Caught by domestic craft, principally in waters off Central America, and s the United States. Reported by the U.S. Bureau of the Census as "Produc American Fisheries."
4/The composition of imported shrimp includes estimates for 1962 and 1963. by commodities listed below were converted to heads-on weight by multip quantity of headless shrimp by 1.59, raw meat by 2.04, cooked meat by breaded by 1.00, canned by 3.21, dried by 7.69, and unclassified by 1.

Item	1964	1963	1962
	(1,000 Lbs.)		
Shrimp:			
Headless	112,149	111,717	108,628
Meat, raw	27,385	29,460	22,703
Meat, cooked	2,585	2,547	1,995
Breaded	508	484	421
Canned	3,004	4,120	2,911
Dried	404	279	56
Unclassified	8,542	2,923	4,469
Total	154,577	151,530	141,183

5/May include some fresh products.
6/Not available.
7/The totals do not add and are less than actual totals because products frozen once were eliminated.
Note: To convert the weight of heads-on shrimp to heads-off, divide by 1.59 give approximate weight of heads-off shrimp.

uth Atlantic Fisheries Explorations d Gear Development

STOCKS OF BROWN SHRIMP OFF ORIDA'S EAST COAST STUDIED: /V "Oregon" Cruise 99 (March 8-17, 5): To obtain more information on the lo- on and catch rates of offshore brown shrimp haeus aztecus) stocks off Florida's east st between Cape Kennedy and Stuart was bjective of this cruise by the exploratory ing vessel Oregon of the U. S. Bureau of mmercial Fisheries. Brown shrimp were vered in that area during a January 1965 se of the Oregon.



vestigated off Florida's east coast during M/V Oregon 99 (March 8-17, 1965).

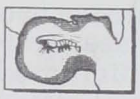
ring this cruise, a total of 61 trawling ns was made in depths of 10 to 70 fath- sing standard 40-foot and 70-foot flat p trawls. The work done on the cruise led a wide scattering of the brown shrimp s with all catch rates below commercial . This was in sharp contrast to the defined concentration of shrimp in a of 30 to 32 fathoms found in January 1965. The highest catch rate with the 65-foot trawl was 25 pounds of 16-20 count (heads-on) brown shrimp per hour.

Bottom temperature patterns during the cruise were very confused. It appeared that the two weeks of strong winds immediately preceding the cruise severely affected environmental conditions in the fishing area. Bottom temperatures were obtained with a reversing thermometer at 41 locations between 10 and 40 fathoms. These showed a 6° to 10° F. variation at all depths between 22 and 38 fathoms and an apparent break-up of typical depth/temperature stratifications.

Trawlable bottom was found over most of the 10- to 38-fathom range, with scattered patches of broken bottom causing a few tear-ups. A 2-fathom ridge was encountered along the 39-40 fathom depth level.

Small numbers of pink shrimp (P. duorarum) were scattered in catches between 10 and 23 fathoms. Scattered white shrimp (P. setiferus) were found in 10 to 12 fathoms.

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



Sport Fishing

LICENSE SALES INCREASED IN 1964: A total of 20,219,457 sport fishermen in the United States bought sport fishing licenses in fiscal year 1964 (July-June) as compared with 19,831,644 in fiscal year 1963, the U. S. Interior Department announced on April 21, 1965.

The number of licensed sport fishermen in 1964 was 387,813 more than in the previous fiscal year, and total license expenditures increased by $2,433,168 to a new high of $60,213,427.

State game and fish departments in the 50 States certify the number of their paid hunting and sport-fishing license holders to Interior's Bureau of Sport Fisheries and Wildlife for use as a basis for distributing Federal aid funds for state fish and wildlife restoration projects.

The number of paid license holders is not an accurate measure of the total hunting and fishing public, the Department of the Interior pointed out. In most States, persons younger

Fisherman in large spring near Page Dam, Malheur Refuge, Oregon; casting fishing rod and creel shown.

or older than certain age limits are allowed to hunt or fish without licenses. Also, some States allow landowners to hunt or fish on their own property without a permit and only 6 States require a license to fish in salt water.

Some States require sportsmen to purchase separate licenses, stamps, permits, or tags to fish for different kinds of fish. For example, a special stamp is required in some States to fish for trout.

U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-April 3, 1965, amounted to 5,631,316 pounds (about 268,158 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was considerably less than the 7,222,255 pounds (about 343,917 standard cases) imported during January 1-March 28, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the $12\frac{1}{2}$-percent rate of duty has not been announced; however, in 1964 the quota was 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota would have been dutiable at 25 percent ad valorem.

* * * * *

TRENDS IN UNITED STATES IMPORTS OF FISHERY PRODUCTS, 1963:

The value of annual imports of fishery products entering the United States reached a new high in 1963. In that year, United States fishery imports from more than 100 countries rose to a total value (at foreign port of shipment) of $490,708,000. This was an increase of 1 percent or $6 million more than the 1962 imports, and an increase of 44 percent or $93 million over the value of the 1961 fishery product imports. Imports of edible fishery products in 1963 were valued at $394,546,000; inedible fishery products $96,162,000. The value of imported fishery products continued to greatly exceed United States exports of similar products.

Table 1 - Value of U.S. Imports of Fishery Products (Edible and Inedible) by Selected Countries of Origin, 1959-63

Country	1963	1962	1961	1960	1959
	(US$1,000)				
Canada	118,040	116,336	108,035	102,877	101,9
Japan 2/	95,357	107,773	88,263	85,256	96,2
Mexico	59,906	53,529	45,766	36,705	32,8
Peru	35,038	24,818	16,729	14,270	16,3
So. Africa Repbulic	17,270	19,688	14,468	12,030	12,0
Norway	16,778	18,950	15,101	12,506	16,4
Australia	12,520	14,884	10,856	9,839	8,1
Iceland	15,006	11,607	11,528	9,306	10,0
Panama	7,076	7,884	6,707	5,767	6,4
Brazil	6,198	6,827	5,074	3,916	3,0
Denmark	5,412	7,069	5,246	4,342	8,2
Ecuador	5,788	6,443	4,619	4,467	4,1
Portugal	5,533	5,984	6,525	5,289	5,4
India	8,353	5,664	2,777	2,363	2,2
El Salvador	4,303	5,100	5,510	4,215	1,2
West Germany	4,178	5,278	4,160	4,100	1,8
Netherlands	3,460	3,667	1,736	2,562	2,0
France	2,724	2,750	2,087	2,317	2,
United Kingdom	4,578	3,415	2,309	1,759	2,
Chile	6,046	4,208	2,089	2,630	1,
Angola	623	554	500	267	3,
Cuba	-	98	1,793	3,901	4,
Other	56,521	52,331	35,180	29,381	23,
Total	490,708	484,857	397,058	360,065	366,

1/Value at the foreign port of shipment.
2/Does not include fresh or frozen fish, mostly tuna, transhipped through other countries.

Trend by Countries: Canada, Japan, and Mexico continued to be leading suppliers of fishery products to the United States (table 1). Those 3 countries accounted for 55 percent of the total value of fishery products imported. Canada supplied 24 percent of the total, Japan 19 percent, and Mexico 12 percent. Peru, South Africa Republic, Norway, Iceland, and Australia were the next leading suppliers with imports ranging from $12 to $ million.

CANADA: Canada, with fishery products valued at $118 million continued to be the principal supplier of fishery products to the United States. Imports from that country in 1963 increased about 1 percent over the preceding year. Leading commodities were as follow

	1963	1962
	. . . (US$1,000) . . .	
Fresh or Frozen:		
Lobster	16,259	15,000
Fresh-water fish	10,881	11,737
Fish blocks	15,373	15,162
Groundfish fillets	12,481	12,526
Salmon	4,810	5,298
Halibut	6,216	7,791
Flounder fillets	4,594	5,422
Fresh-water fillets	6,441	5,693
Scallops	6,168	4,810
Other fresh or frozen	6,487	5,295
Canned lobster	4,332	5,507
Fish meal and scrap	6,489	5,193
Cod, haddock, etc., pickled or salted	6,815	6,698
Other fishery products	10,694	10,204
Total	118,040	116,336

JAPAN: The value of fishery imports from Japan was $95,357,000 a decrease of 13 percent from 1962. Japan ranked second among United States suppliers of fishery products. Tuna and pearls still remained the leading commodities. United States imports of fishery products from Japan were:

	1963	1962
	. . . (US$1,000) . .	
Fresh or frozen:		
Albacore	9,091	9,759
Albacore loins and discs	861	669
Other tuna	16,020	16,025
Other loins and discs	2,367	3,118
Shrimp	2,443	2,740
Swordfish	4,616	6,232
Fresh-water trout	977	747
Frog legs	1,143	1,362
Oysters	829	213
Halibut and salmon (mainly halibut)	924	1,944
Fish filleted, boned	737	1,161
Canned:		
Light meat tuna in brine	13,712	12,053
White meat tuna in brine	7,383	7,912
Salmon	406	2,238
Crab meat	6,331	4,635
Clams	810	809
Oysters	2,645	2,410
Pearls, cultivated	17,277	17,934
Whale and sperm oil	1,819	3,563
Other	4,966	12,249
Total	95,357	107,773

MEXICO: Mexico ranked third as a supplier of fishery products to the United States. Although the quantity of shrimp received from that country was lower than in 1962, the value of fishery imports from Mexico continued to increase and in 1963 was up 10 percent from the previous year. The value of fishery imports from Mexico was:

	1963	1962
	. . . (US$1,000) . . .	
Shrimp	51,656	46,700
Abalone	3,440	2,512
Lobster	1,012	1,077
Other	3,798	3,240
Total	59,906	53,529

PERU: The marked increase in the value of imports from Peru in 1963 was due to increased shipments of fish meal and scrap which amounted to over $26 million--up 52 percent from the previous year. Imports from Peru of principal fishery products and byproducts were:

	1963	1962
	. (US$1,000) .	
Fish meal and scrap (fertilizer)	884	685
Fish meal and scrap (animal feed)	25,459	16,143
Bonito and yellowtail (canned)	1,531	2,247
Tuna, skipjack, fresh or frozen	2,856	2,219
Tuna, yellowfin, fresh or frozen	1,577	1,721
Other	2,731	1,803
Total	35,038	24,818

ICELAND: Fishery products represent 90 percent of Iceland's total exports. Imports from Iceland to the United States in 1963 amounted to $15,006,000 in 1963--up 29 percent from a year earlier. Fish fillets and blocks accounted for nearly all of the imports from that country.

	1963	1962
	. (US$1,000) .	
Fillets, fresh or frozen	5,009	4,613
Fish blocks and slabs	7,010	5,547
Other	2,987	1,447
Total	15,006	11,607

AUSTRALIA: Australia is rapidly becoming one of the world's leading exporters of high-valued fishery products. The value of United States fishery imports from Australia was $12,520,000 in 1963 and consisted of mostly frozen spiny lobster tails valued at $11,619,000. United States imports from Australia have increased steadily since 1958 but dropped 16 percent in 1963 as compared with the previous year. The value of fishery imports from Australia was:

	1963	1962
	. . (US$1,000) . .	
Spiny lobster tails	11,619	13,867
Other	901	1,017
Total	12,520	14,884

OTHER COUNTRIES: Other leading suppliers of fishery products to the United States market are listed below showing the principal product shipped and the value of United States imports of that product:

	US$1,000
South Africa Republic - Spiny lobster tails	12,754
Panama - Shrimp	6,975
India - Shrimp	6,000
Norway - Canned Sardines (in oil)	5,858
British Guiana - Shrimp	4,668
El Salvador - Shrimp	4,254
Brazil - Spiny lobster tails	3,823
Ecuador - Shrimp	4,374

Area of Origin: During 1963, North American countries continued to be the principal source of supply for

Table 2 - Value of United States Imports of Fishery Products by Area of Origin, 1963 1/

Area	Edible	Inedible	Total
North America	191,014	9,184	200,198
Asia	86,450	30,400	116,850
South America	30,005	38,119	68,124
Europe	50,060	15,581	65,641
Oceania	16,653	328	16,981
Africa	20,364	2,550	22,914
Total	394,546	96,162	490,708

1/Value at the foreign port of shipment.

Table 3 - Value of United States Imports of Fishery Products by Selected Commodities, 1959-63 1/

Commodity	1963	1962	1961	1960	1959
	(US$1,000)				
Edible Products:					
Fresh or frozen:					
Shrimp	101,911	91,898	68,538	56,380	52,306
Tuna	34,962	45,715	30,228	31,713	29,728
Groundfish fillets and blocks	50,328	46,937	42,595	33,265	38,759
Lobster	54;473	57,182	49,039	44,794	38,635
Other	68,300	71,822	63,547	61,845	60,940
Total fresh or frozen	309,974	313,554	253,947	227,997	220,368
Canned:					
Tuna	23,864	22,884	22,175	19,142	21,688
Salmon	605	3,435	3,545	7,541	11,130
Sardines	12,994	16,291	12,543	9,115	8,370
Crab meat	6,370	4,701	5,780	5,514	7,947
Lobster	4,818	5,811	4,779	5,239	6,441
Other	19,444	18,878	17,530	16,067	17,083
Total canned	68,095	72,000	66,352	62,618	72,659
Other edible products	16,477	15,328	15,458	16,765	18,006
Total edible products	394,546	400,882	335,757	307,380	311,033
Inedible products:					
Fish meal	37,039	24,298	16,740	11,068	15,884
Pearls	17,906	18,935	16,925	14,563	13,678
Other	41,217	40,742	27,636	27,054	25,905
Total inedible products	96,162	83,975	61,301	52,685	55,467
Total fishery imports	490,708	484,857	397,058	360,065	366,500

1/Value at the foreign port of shipment.

fishery products imported into the United States. Imports from Asia and South America ranked in second and third place.

Foreign trade plays a significant role in the economics of the United States fishing industry. In 1963, imports accounted for 56 percent of the total United States supply of fish and fish products. In a review of world import trade, data compiled for 1961 by the Food and Agriculture Organization (FAO) confirmed that the United States ranked as the world's leading importer of fishery products. According to FAO data, the United States bought more than twice as much fishery products as any other country. The United Kingdom ranked second and West Germany ranked third as importers of fishery products. United States imports of fishery products also surpassed fishery imports by the European Common Market when the imports of its member countries were considered as a unit.

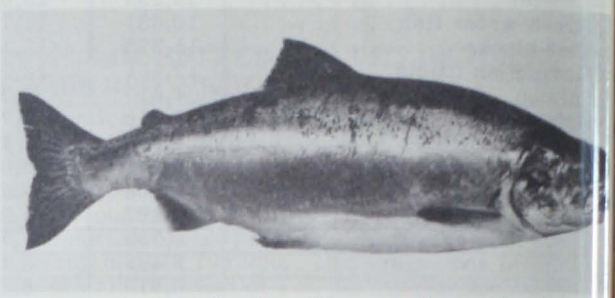
Note: See Commercial Fisheries Review, February 1964 p. 56.

Washington

SALMON OUTLOOK IN PUGET SOUND ANNOUNCED AS NET FISHING REGULATIONS ARE SET FOR 1965:

The 1965 salmon runs to Puget Sound in Washington should include a good pink salmon run (but not as good as in 1963), a better than average run of king (chinook) salmon, a good run of silver (coho), and a better sockeye run than in 1963. But a poor run of chum salmon is expected. Those predictions were announced during public hearings in March 1965 when state regulations were adopted for the 1965 net fisheries for salmon in Puget Sound.

The 1965 Puget Sound net regulations are designed to generally allow open seasons of 4 to 5 days a week for king salmon, 2 days a week for sockeye, 3 days a week for pink, days a week for silver, and 2 to 4 days a week for chum salmon.



Pink or humpback salmon (Oncorhynchus gorbuscha).

Commercial net fishing for salmon in most areas of Puget Sound will begin eith June 12 or June 28 and run until Novemb 30, 1965. (An early season during part o May will be allowed in a few areas.) We closed periods will vary from area to are There are 11 salmon fishing areas in Pug Sound and the Strait of Juan de Fuca. (Wa ington State Department of Fisheries, Ma 29, 1965.)

* * * * *

SALMON FARM OPERATED IN COOPERATION WITH SPORT FISHING CLUB:

Grays Harbor on the Washington coast the site of a cooperative salmon-rearing effort by the Washington Department of F eries and a local sport fishing club. The project began in 1964 when 50,160 king (c nook) salmon fry were planted in the Ca bell Slough of Grays Harbor. The fish, w had been previously reared at the Simps Hatchery, averaged 284 a pound and abo inches in length when planted. By June 1964, the Campbell Slough salmon fry ta in test seines averaged 71 to the pound. indicated good growth, and survival appea quite high. In late June 1964, stop-logs removed from the outlet structure and t young salmon were allowed to migrate i Grays Harbor and begin their ocean jou

Adult fish will be returning from tha plant in 1966 and 1967 to contribute to th various sport and commercial fisheries Grays Harbor and the Pacific Ocean.

The Campbell Slough salmon farm is erated by the Washington State Fisheries Department in cooperation with the Gray Harbor Poggie Club and certain propert owners. The Poggie Club purchased nec

y materials for the Slough's outlet struc-e, which was installed by the Fisheries partment.

The slough was treated with chemicals uary 27, 1965, to rid it of scrapfish that ld compete for food with the young chinook also gobble up the small, growing salmon. ther salmon plant of 75,000 king salmon was introduced into Campbell Slough on ch 16, 1965. (Washington State Depart- of Fisheries, April 8, 1965.)

olesale Prices

IBLE FISH AND SHELLFISH, RIL 1965:

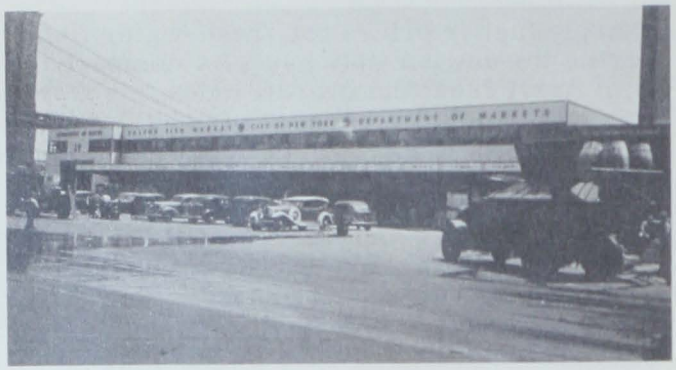
Prices in April 1965 were up 0.5 percent m the lower seasonal level of the previous nth. A further decline from March to il in prices for several fresh fish items offset by higher prices for a number of major frozen fishery products (mostly use of declining cold-storage stocks) and sharply higher prices for fresh-water fish during the Jewish Holidays. As compared with April 1964, the overall index this April was up 5.5 percent because of substantially higher prices for frozen halibut, Great Lakes fish, and moderately higher prices for ex-vessel haddock.

In the subgroup for drawn, dressed, or whole finfish, ex-vessel prices at Boston for large haddock this April dropped 20.5 percent from the previous month because of the seasonal increase in landings. But prices for other items in the subgroup were higher than in March. At New York City, prices for western frozen halibut were up 2.1 percent due to lower warehouse stocks. During the Jewish Holidays in April, prices were up sharply at New York City for Great Lakes round yellow pike (up 17.6 percent) and at Chicago for fresh Lake Superior whitefish (up 36.0 percent). From March to April 1965 the subgroup index was up 0.2 percent but was 12.8 percent higher than in April 1964 because of substantially higher prices this April for frozen halibut and Great Lakes fish.

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			April 1965	Mar. 1965	April 1965	Mar. 1965	Feb. 1965	April 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.8	108.3	109.7	103.1
Fresh & Frozen Fishery Products:					113.3	112.5	114.5	103.7
Drawn, Dressed, or Whole Finfish:					111.0	110.8	115.1	98.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.11	69.5	87.4	99.2	67.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.41	.40	119.8	117.3	117.3	82.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.83	115.3	115.3	118.8	116.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.85	.63	126.9	93.3	96.3	84.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	1.00	.85	163.7	139.2	131.0	69.6
Processed, Fresh (Fish & Shellfish):					114.5	112.3	115.1	115.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.35	.40	85.0	97.1	105.6	75.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.00	.95	117.2	111.3	113.7	111.3
Oysters, shucked, standards	Norfolk	gal.	6.88	6.88	115.9	115.9	118.0	126.5
Processed, Frozen (Fish & Shellfish):					109.5	109.3	108.6	94.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.37	.38	93.8	95.0	88.7	93.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.39	108.5	112.9	114.3	107.0
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.31	105.2	108.7	108.7	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.94	.92	111.5	108.5	107.9	86.6
Canned Fishery Products:					101.2	101.3	101.8	102.5
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	20.25	20.50	88.3	89.3	91.5	95.9
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.44	11.44	101.6	101.6	102.6	103.3
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	105.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.00	131.5	128.3	128.3	116.5

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.



The newer of two wholesale market buildings in the New York City Fulton Fish Market as it looked in 1940. There are plans to relocate the market.

Higher prices for fresh South Atlantic shrimp at New York City (up 5.3 percent) in April 1965 offset a fairly substantial price drop at Boston for fresh small haddock fillets (down 12.5 percent). As a result, the subgroup price index for processed fresh fish and shellfish rose 2.0 percent from March to April but was 0.4 percent lower than in April 1964 because of lower prices at Norfolk for shucked standard oysters.

The April 1965 subgroup index for processed frozen fish and shellfish rose only slightly from the previous month (up 0.2 percent). Prices were lower than in March for all items in the subgroup except frozen shrimp which rose 2.8 percent from March to April. As compared with April 1964, the index this April was 15.6 percent higher mainly because of a much stronger shrimp market and slightly higher prices for frozen haddock fillets (up 1.4 percent).

Market conditions for canned fishery products were mostly steady during April 1965. Prices for canned pink salmon were down only slightly from the previous month and movement of stocks continued at a good pace. Very low stocks of canned Maine sardines before the start of the new packing season were responsible for a 2.5-percent price increase from March to April and prices were 12.9 percent higher than in April 1964. As compared with the same month a year earlier, the canned fishery products subgroup index this April was down 1.3 percent as a result of lower prices for canned tuna and canned pink salmon.

SHARK REPELLENTS TESTED

A number of experiments to test the effect of repellents on sharks have been carried out by the U. S. Bureau of Commercial Fisheries Tuna Resources Laboratory, La Jolla, Calif., as a part of its tuna behavior program. Sharks associated with tuna are responsible for serious economic losses to commercial fishermen both because of damage to the nets and to the fish within the nets. During the experiments, sharks were attracted to the vessel by chumming, and repellents were then tested on the feeding sharks.

Repellents tested included commercial "Shark Chaser," nigroscein dye, fluorescein dye, and copper sulfate. In addition, the repelling effect of sound was tested with a "white noise" emitter designed by a United States East Coast firm. None of the repellents was found to be effective. Copper sulfate may have slowed the feeding frequency somewhat but did not stop it. The use of the mini-sub--a two-man, free-flooding submersible--and a special aluminum shark cage developed by a Bureau scientist made possible the documentation of the tests with some remarkable underwater motion pictures.