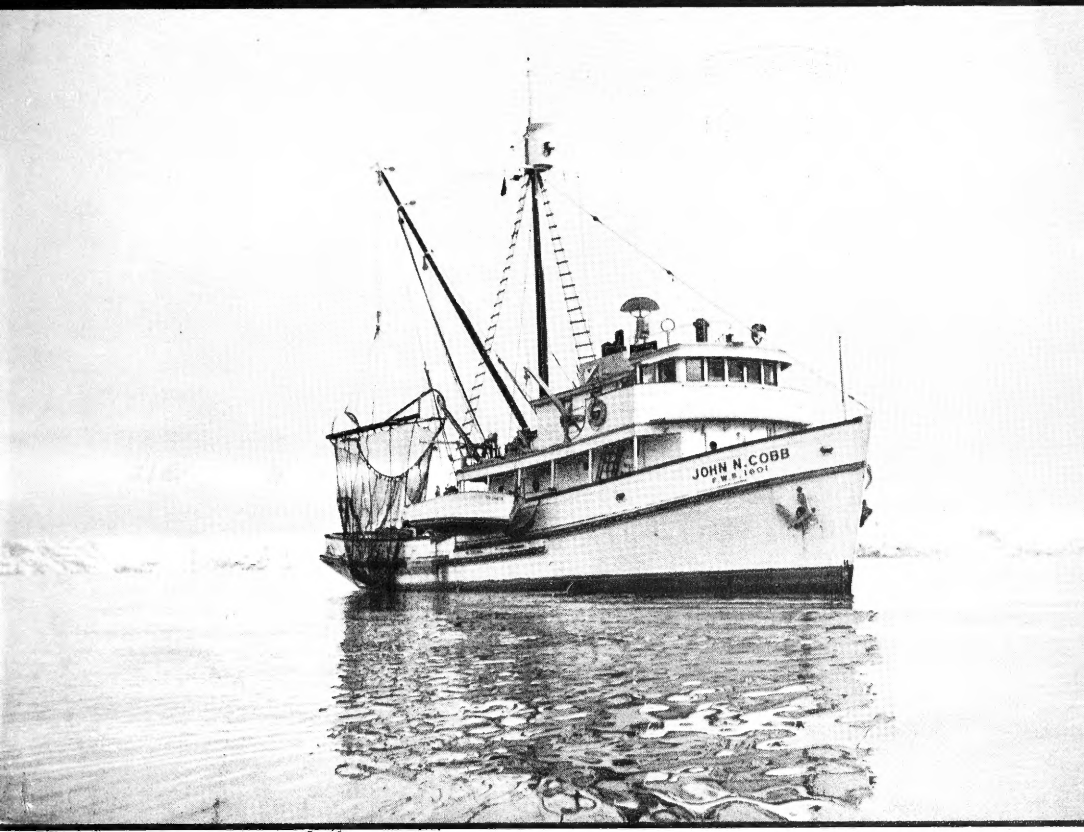
COMMERCIAL FISHERIES REVIEW



Vol. 15, No. 3 MARCH 1953

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United States Department of the Interior
Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

FISH AND WILDLIFE SERVICE
ALBERT M. DAY, DIRECTOR

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

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COMMERCIAL FISHERIES REVIEW

March 1953 Washington 25, D.C. Vol.15,No.3

SHELLFISH EXPLORATIONS IN CERTAIN SOUTHEASTERN ALASKAN WATERS BY THE JOHN N. COBB, SPRING 1952

By Edward A. Schaefers*

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SUMMARY

The fourth in a series of shellfish explorations in southeastern Alaska was made during the late winter and the early spring of 1952. Fishing operations were carried out between March 8 and April 28. A 20-foot beam trawl and various types of shrimp traps were used throughout this exploration.

Of the areas explored, the best shrimp catches were made in Glacier Bay. Shrimp were taken in good quantities in most of the localities dragged and results indicate this region would support a commercial shrimp fishery. The best catches, up to 330 pounds per one-hour drag, were taken between South Marble Island and the entrance of Muir Inlet. Other localities in Glacier Bay where catches exceeded 225 pounds per one-hour drag included Geikie Inlet, Queen Inlet, between Geikie and Hugh Miller Inlets, and Muir Inlet. The bottom in Glacier Bay was found to be generally free of obstructions; however, some difficulty was experienced from "mudding down" in certain inlets. Although numerous icebergs were encountered in certain parts of Glacier Bay, they at no time curtailed the fishing activities of the John N. Cobb.

Fair catches of shrimp were also taken in Affleck Canal and Port Althorp. Best catches in these areas were 142 and 172 pounds per one-hour drag, respectively. Other regions explored yielded only small amounts of shrimp. Trap sets resulted in poor catches of shrimp throughout the exploration.

INTRODUCTION

Since the spring of 1950, the U. S. Fish and Wildlife Service's exploratory fishing vessel John N. Cobb has been engaged in a series of investigations to explore the shellfish potentialities of certain southeastern Alaskan waters. The fourth exploration in this series was carried out during March and April 1952. The main objective was to investigate the shrimp resources in areas which had not been commercially fished for shrimp.

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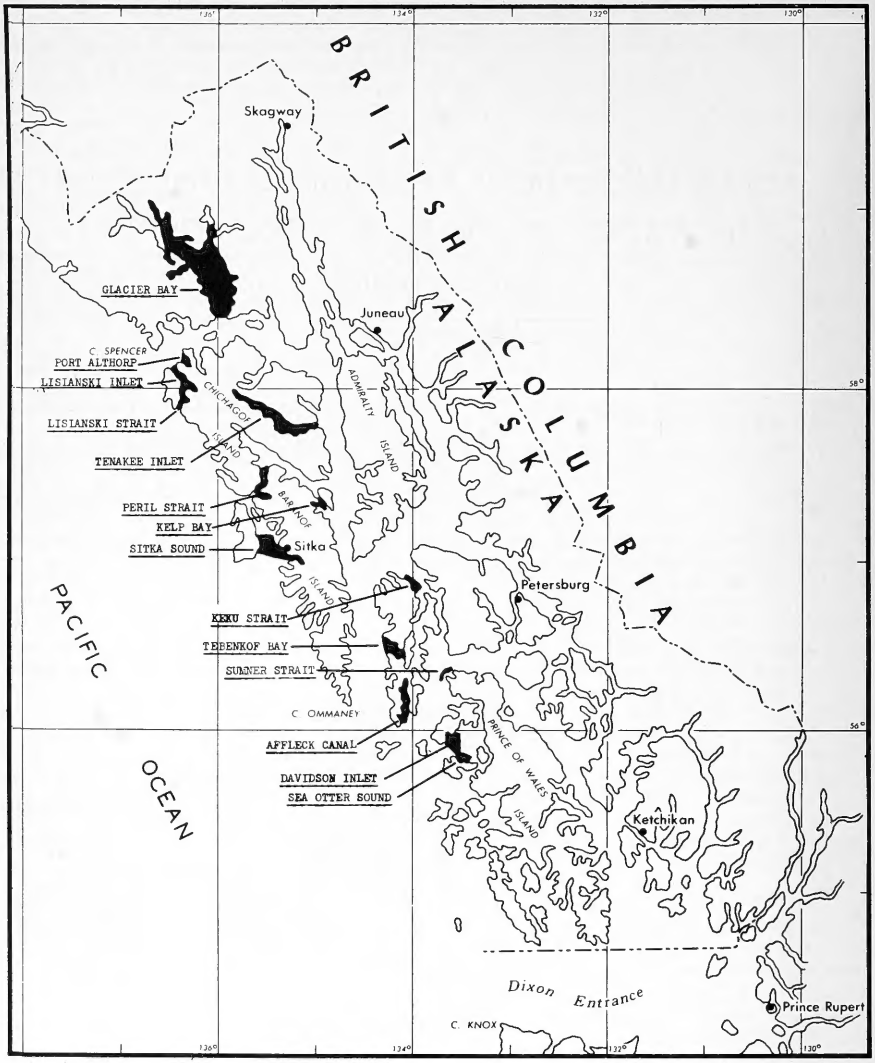

FIG. 1 - SOUTHEASTERN ALASKA. SHADED AREAS WERE EXPLORED FOR SHELLFISH IN MARCH AND APRIL 1952.

The vessel left Seattle on March 3 and returned on May 3. Fishing operations were conducted from March 8 to April 28. Areas explored for the first time by the John N. Cobb included Lisianski Inlet, Lisianski Strait, Port Althorp, Glacier Bay, Kelp Bay, Tebenkof Bay, Affleck Canal, Davidson Inlet, Sea Otter Sound, and the Point Baker area of Sumner Strait. In addition, further work and testing of shrimp traps was carried on in certain areas previously explored by the John N. Cobb (Schaefers 1951, Ellson and Livingstone 1952). These areas were Peril Strait, Tenakee Inlet, Sitka Sound, and Keku Strait (fig. 1).

During the trip 96 drags were made with a beam trawl, and 365 individual shrimp traps were set. The locations of drags and trap sets are shown in figures 7, 9, 12, and 15. Detailed information on the size, quantity, and commercial varieties of shrimp taken in each drag is presented in table 2. Data concerning shrimp trap sets are given in tables 1 and 3.

Table 1 - Shrimp Trap Catches By John N. Cobb, Tenakee Inlet, (Comparison of Fall 1950 with Spring 1952)

Location	Year	No. of Traps Set	Depth Range in Fathoms	Total Hours Out	Shrimp Catch			
					Spot		Coon-stripe	
					Size[1]	Lbs.	Size[1]	Lbs.
Near Drag No. 74	1950	6	15-17	39	8	26	33	7 3/4
	1952	7	17-38	23	10	2	47	10 3/4
Off entrance of Seal Bay	1950	3	20	38	10	18	-	-
	1952	6	20-36	28	15	6 1/4	-	-
Between Saltery and Seal Bay	1950	3	15	38	15	2	-	-
	1952	6	16-32	28	-	(10)[2]	-	(15)[2]
Between Crab and Saltery Bay	1950	6	20-24	41	20	15	-	(29)[2]
	1952	13	19-44	20	23	11 1/2	56	2 3/4

1/NUMBER OF WHOLE SHRIMP PER POUND. 2/NUMBER OF SHRIMP CAUGHT INSTEAD OF WEIGHT IN POUNDS.

GEAR

All drags were made with a 20-foot beam trawl. The net was constructed with 36-thread 1½-inch stretched-mesh cotton webbing, 150 meshes deep (for detailed specifications of the beam trawl see Ellson and Livingstone 1952). The beam was a hemlock pole approximately 8 inches in diameter and cut down to 6 inches at each end to allow for attachment of the "D" frames. In areas where hemlock poles were not available, a 6 x 6-inch milled fir beam was used.

Four types of shrimp traps were fished experimentally: two- and four-tunnel non-collapsible iron traps, four-tunnel collapsible iron traps, and two-tunnel non-collapsible wooden traps.

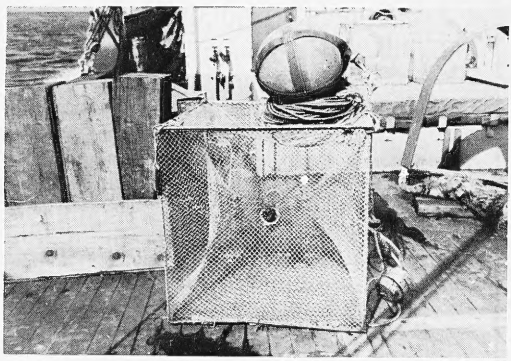

FIG. 2 - FOUR-TUNNEL NON-COLLAPSIBLE-TYPE SHRIMP TRAP.

The four-tunnel non-collapsible trap (fig. 2) was also fished during the John N. Cobb's 1950 shellfish explorations and was described by Schaefers (1951).

The four-tunnel collapsible trap was cubic in shape with sides 24 inches square (fig. 3). The top frame was $\frac{1}{2}$ x $1\frac{1}{4}$-inch galvanized iron; the bottom frame $\frac{3}{4}$ x 1-inch galvanized iron; and the four vertical supports were 5/8-inch-diameter galvanized iron rods. Holes were drilled through each corner of the top and bottom frame for insertion of the rods. Hexagonal nuts at the ends of each rod secured them to the top and bottom frame (fig. 4). The trap could be collapsed by removing the outside nuts and the vertical rods. The lid frame was 3/8-inch-diameter galvanized iron. Three holes were drilled in one side of the top frame and a 14-gauge wire was passed through these holes and wound around one side of the lid frame to form hinges. The lid was secured on the other side with twine. The tunnel entrances were formed by 3-inch-diameter galvanized iron rings, located in the center of each vertical side. The tunnel indentations were formed by cross-tying the opposing rings with seine twine. This procedure was also used in the other types of traps. The frame and the tunnels were covered with 15-thread $1\frac{1}{4}$-inch stretched-mesh cotton netting.

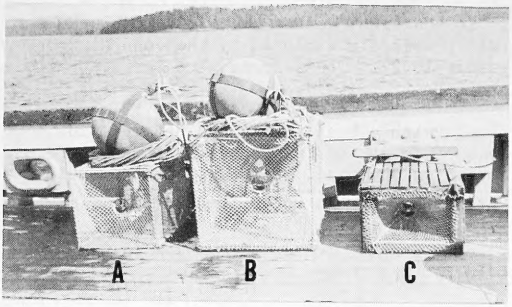

FIG. 3 - THREE TYPES OF SHRIMP TRAPS USED DURING THIS EXPLORATION. A - TWO-TUNNEL NON-COLLAPSIBLE TRAP. B - FOUR-TUNNEL COLLAPSIBLE TRAP. C - TWO-TUNNEL NON-COLLAPSIBLE WOODEN TRAP.

The two-tunnel non-collapsible trap (fig. 5) was rectangular in shape, 24 inches long, 18 inches wide, and 16 inches high. The top frame was $\frac{1}{4}$ x 1-inch galvanized iron, and the bottom frame 3/8 x 1-inch galvanized iron. Four $\frac{1}{2}$-inch-diameter galvanized iron rods, welded at each end to the corners of the top and bottom frame, formed the sides of the frame. The lid frame was constructed of the same material and operated in the same manner as that of the four-tunnel collapsible trap. The tunnel entrances were formed by 3-inch-diameter galvanized iron rings located in the center of each end. The frame and the tunnels were covered with 15-thread $1\frac{1}{4}$-inch stretched-mesh cotton netting.

The wooden trap was rectangular in shape, 24 inches long, 18 inches wide, and 13 inches high. The sides and bottom were covered with strips of lath, spaced 3/8-inch apart and nailed to 1-5/8 x 1-5/8-inch end frames. The lid was also made of lath nailed to $\frac{3}{4}$ x $1\frac{3}{4}$ inch fir boards located near each end of the trap. Strips of leather were used as hinges for the lid. The tunnel entrances were formed by 3-inch-diameter galvanized iron rings, located in the center of each end. The tunnels were covered with 15-thread $1\frac{1}{4}$-inch stretched-mesh cotton webbing.

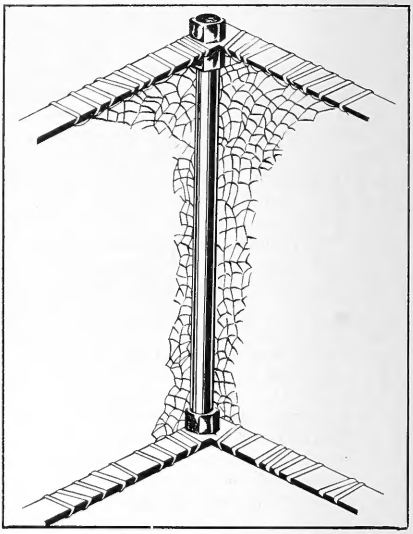

FIG. 4 - PORTION OF FOUR-TUNNEL COLLAPSIBLE SHRIMP TRAP SHOWING METHOD OF SECURING VERTICAL ROD TO THE TOP AND BOTTOM FRAME.

Frozen herring was used as bait in all trap sets. The herring was cut into pieces, placed in a net bait bag, and suspended from the tunnel crossties. A motor launch was frequently used simultaneously with the John N. Cobb in setting and hauling shrimp traps. The launch had a capstan operated by means of a power take-off from the launch's engine (fig. 8). In areas inaccessible to the John N. Cobb, the traps were set and hauled exclusively by the launch.

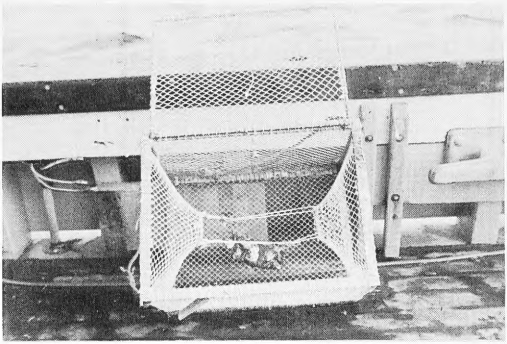

FIG. 5 - TWO-TUNNEL NON-COLLAPSIBLE SHRIMP TRAP WITH TOP OPEN AND BAIT IN PLACE.

RESULTS OF GEAR TESTS

To obtain a comparison of the effectiveness of the four types of shrimp traps used, two sets were made in Keku Strait (fig. 7) where spot (Pandalus platyceros) and coon-stripe (Pandalus hypsinotus) shrimp are fished commercially.

Eight traps, two of each type, were fished off Pup Island and the same number were fished near the Keku Islands. In each location the traps were set at the same depths and as close to each other as practicable. All traps caught shrimp but no significant difference in amount was noted. The set off Pup Island caught 23 pounds of coon-stripe shrimp and a trace of spot and pink shrimp, while that off the Keku Islands produced 18½ pounds of spot and 2 pounds of coon-stripe. Results of trap sets during the rest of the trip were generally poor. The four-tunnel collapsible-type iron trap suffered less damage to the frames than the other types because of its heavy construction.

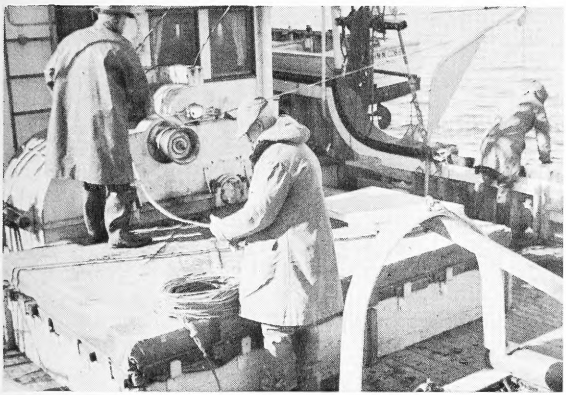

FIG. 6 - HAULING A SHRIMP TRAP ABOARD THE JOHN N. COBB.

FISHING RESULTS

The findings reported in this paper apply to the period March 8 to April 28, 1952. Since the gear used during this period was a 20-foot beam trawl, the catches are smaller than probable with a commercial-size trawl, which normally has a 40- or 50-foot beam. By far the best catches of shrimp were made in Glacier Bay.

GLACIER BAY AREA

Glacier Bay is 56 miles long and varies from 2 to 9 miles in width. It has numerous inlets or arms, most of which were fished by the John N. Cobb. Of the 49 drags made in Glacier Bay (fig. 10), 48 were made north of Strawberry Island.

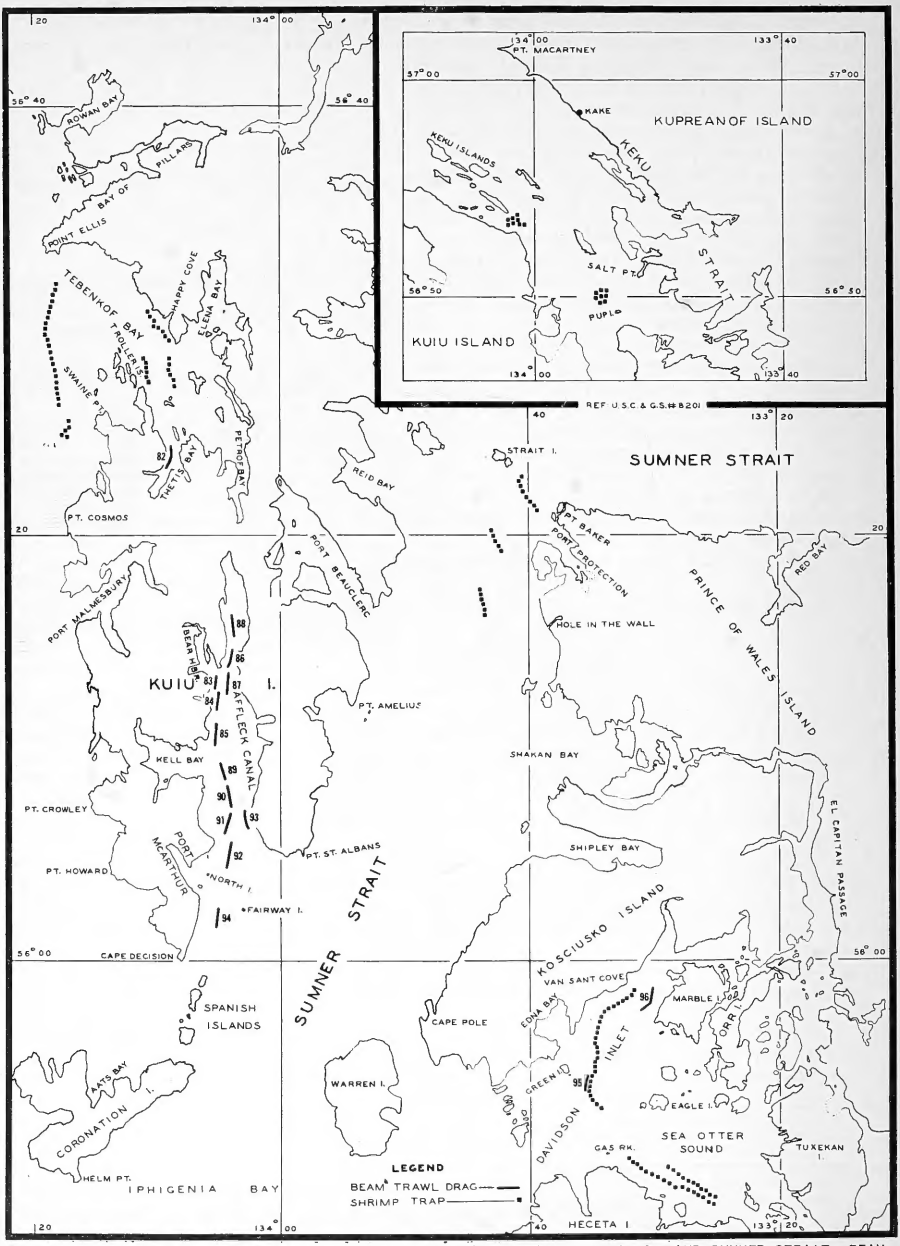

FIG. 7 - LOCATION OF SHRIMP-TRAP SETS IN KEKU STRAIT, SEA OTTER SOUND, AND SUMNER STRAIT; BEAM-TRAWL DRAGS IN AFFLECK CANAL AND BEAM-TRAWL DRAGS AND SHRIMP-TRAP SETS IN TEBENKOF BAY AND DAVIDSON INLET.

The extensive area and the wide distribution of drags which produced good catches indicate that Glacier Bay would support a commercial shrimp fishery. Catches of shrimp in excess of 225 pounds per hour[1] were taken in Geikie Inlet, Queen Inlet, and Muir Inlet; between Geikie Inlet and Hugh Miller Inlet; and between South Marble and Sebree Islands. With the exception of rocky bottom in the Drake Island and Willoughby Island areas, the bottom dragged was predominately mud and adaptable for beam trawling. However, difficulty was experienced from "mudding down" in some localities. A strong tidal condition exists from Willoughby Island to the entrance, and the bottom is unfavorable for dragging.

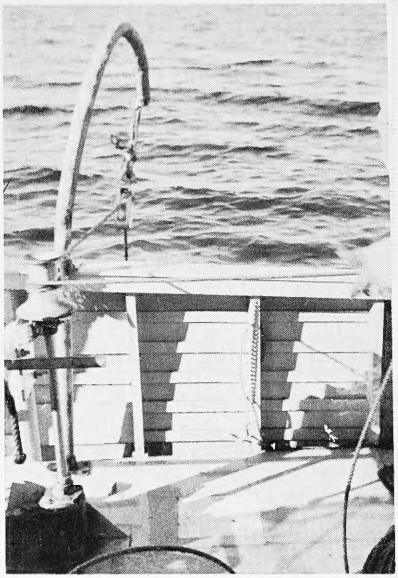

FIG. 8 - HAULING ARRANGEMENTS ON THE MOTOR LAUNCH.

Although icebergs were quite numerous in Glacier Bay, they did not curtail fishery operations. Ice covered the head of Geikie Inlet, the narrow southeast arm of Charpentier Inlet, and the upper reaches of Muir and Adams Inlets. Navigation of Glacier Bay should be undertaken with extreme caution as it has not been completely surveyed above the line from Francis Island to the western entrance point of Muir Inlet. There are no navigational aids within the Bay, and no large-scale chart of the area is available.

Good catches were made in all drags in Geikie Inlet. Drags near the entrance of the inlet encountered snags, but those made approximately halfway between the entrance and the head encountered no difficulty and averaged 261 pounds of shrimp per hour. The catch consisted of 89 percent pink (Pandalus borealis)[2] and 11 percent coon-stripe.[3] Drags between Geikie Inlet and Hugh Miller Inlet averaged 267 pounds per hour (66 percent pink and 34 percent side-stripe, Pandalopsis dispar). The bottom dragged was generally favorable. Suitable dragging grounds were not located in Hugh Miller Inlet.

The drags made in Queen Inlet averaged 167 pounds of mixed pink and side-stripe shrimp per hour. A soft mud bottom caused the first drag to mud down after 8 minutes towing time. In an attempt to prevent this condition in future drags, the chain was removed from the "D" frames and the sweep rope was wrapped with 3-inch-circumference manila line. After this, drags No. 33 to 35 were towed 30 minutes and less mud was encountered in the net. Mud picked up by the trawl was removed by towing the gear behind the vessel before bringing the catch on board.

Considerable difficulty from soft mud was also experienced in Rendu Inlet. Drag No. 36 caught 70 pounds of pink shrimp in 10 minutes before mudding down. When the net was taken aboard, a foul smell was detected and an estimated 5 percent of the shrimp were dead. Only a trace of pink and side-stripe shrimp (nearly

1/CATCH RESULTS HAVE BEEN CONVERTED TO A RATE-PER-HOUR BASIS TO PERMIT READY CATCH COMPARISON AS SOME VARIATION OCCURRED IN THE DURATION OF INDIVIDUAL DRAGS. SEE TABLE 2 FOR DETAILS OF ALL DRAGS.

2/SPECIES WHICH APPEARED IN INSIGNIFICANT QUANTITIES HAVE BEEN INCLUDED AS PINK SHRIMP IN THE DISCUSSION AND FISHING LOG. THESE SPECIES WERE PANDALUS MONTAGUITRIDENS, PANDALUS JORDANI, AND "HUMPY" SHRIMP (PANDALUS GONIURUS).

3/FOR COMPLETE DETAILS OF NUMBER OF WHOLE SHRIMP PER POUND BY SPECIES FOR ALL DRAGS SEE TABLE 2.

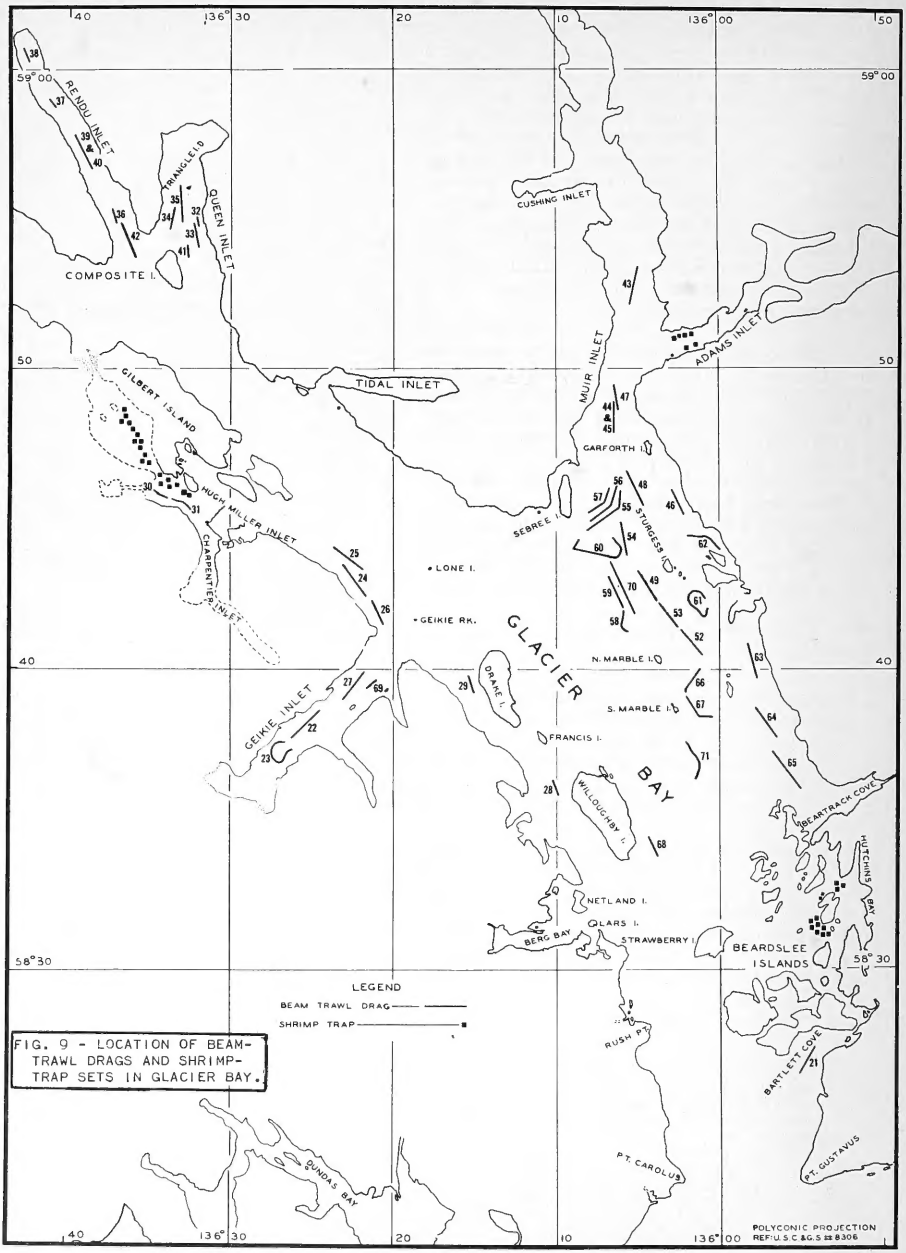

FIG. 9 - LOCATION OF BEAM-TRAWL DRAGS AND SHRIMP-TRAP SETS IN GLACIER BAY.

all of which were dead) were caught by drags No. 40 in Rendu Inlet and No. 43 in Muir Inlet. Other locations in both of these inlets produced catches of live shrimp of good quality, with two drags (No. 45 and 47) in Muir Inlet averaging 216 pounds of shrimp per hour (41 percent pink and 59 percent side-stripe).

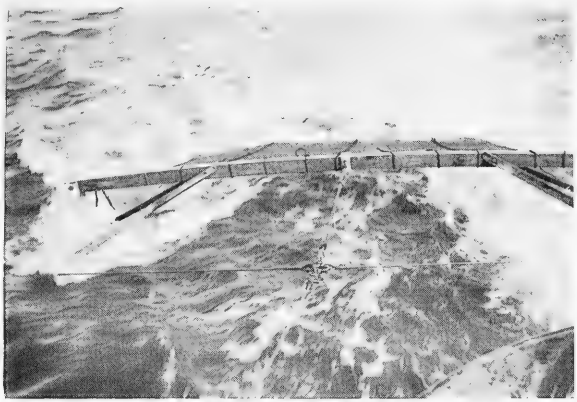

FIG. 10 - TOWING THE BEAM TRAWL BEHIND THE JOHN N. COBB TO WASH MUD FROM THE NET.

The region from Bear-track Cove to the entrance of Muir Inlet proved to be one of the best regions explored in Glacier Bay. This area was predominately gray mud bottom, for the most part free of obstructions, and suitable for drags of several hours duration. With the exception of six drags, catches were relatively free of miscellaneous invertebrates, scrap fish, and debris. Two of the best drags in this area (No. 54 and 60) averaged 313 pounds of shrimp per hour (61 percent pink and 39 percent side-stripe). Six drags made from South Marble Island to Sturgess Island in 80 to 96 fathoms averaged 207 pounds of shrimp per hour (50 percent pink and 50 percent side-stripe).

Shrimp traps set in Hugh Miller Inlet, Adams Inlet, and the Hutchins Bay area produced small quantities of coon-stripe shrimp.

LISIANSKI INLET AND LISIANSKI STRAIT

FIG. 11 - A CLEAN CATCH OF SHRIMP FROM GLACIER BAY ON THE DECK OF THE JOHN N. COBB.

Catches in Lisianski Inlet (fig. 12) were poor with suitable dragging bottom limited mainly to mid-channel locations from Soloma Point to the vicinity of Miner Island. The best catch, made near Pelican City produced 70 pounds of mixed pink and side-stripe shrimp per hour. The head of Lisianski Inlet was covered with ice.

Negligible quantities of shrimp were taken in Stag Bay and Lisianski Strait proper. A total of 118 shrimp traps set in the Lisianski Inlet and the Lisianski Strait area yielded poor catches.

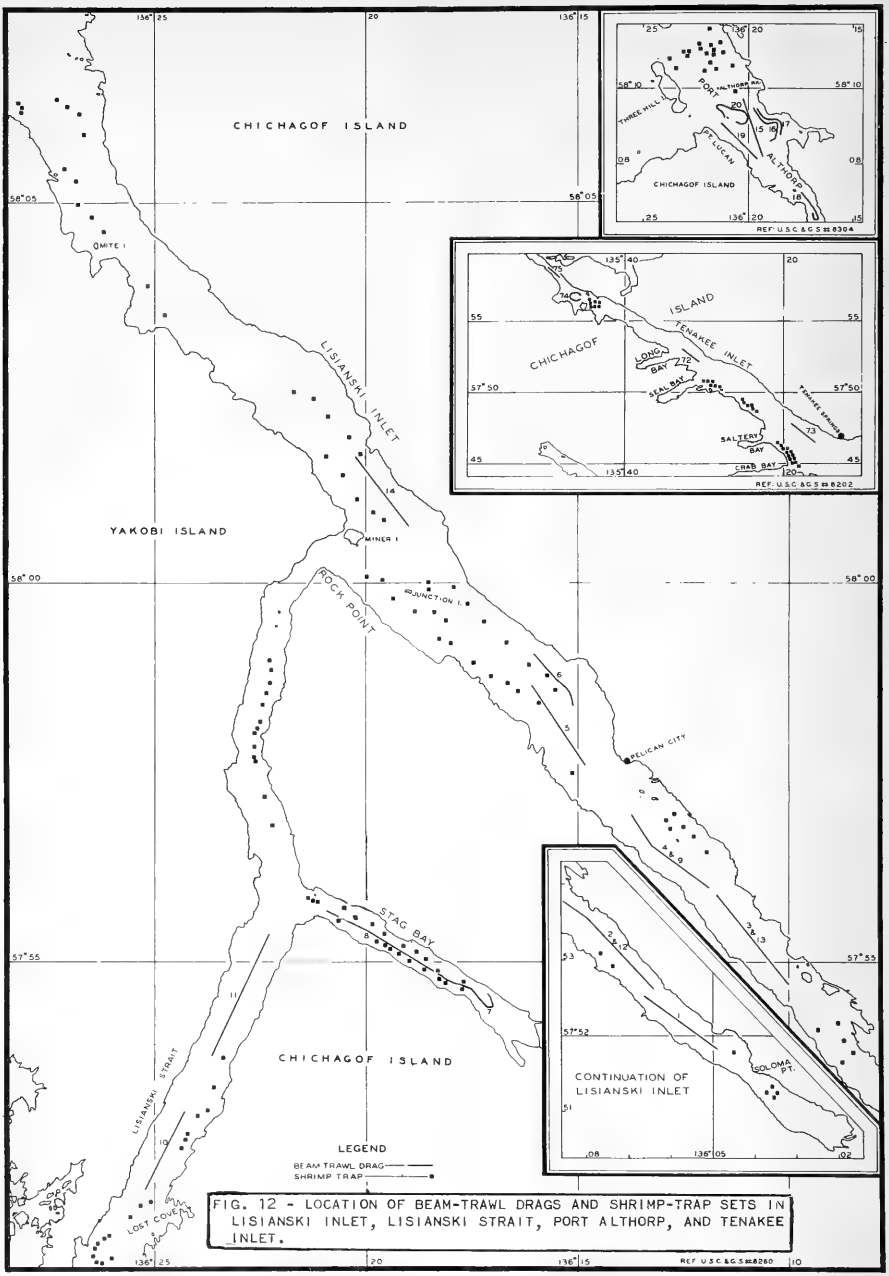

FIG. 12 - LOCATION OF BEAM-TRAWL DRAGS AND SHRIMP-TRAP SETS IN LISIANSKI INLET, LISIANSKI STRAIT, PORT ALTHORP, AND TENAKEE INLET.

PORT ALTHORP

Suitable dragging bottom in Port Althorp (fig. 12) was located in a small area off Point Lucan to the opposite shore of Chichagof Island and in shallow water near the head of the inlet. Only two drags produced a fair showing of shrimp (drags No. 15 and 16). Shrimp traps set in the area caught only a few pink shrimp.

TENAKEE INLET, PERIL STRAIT, AND SITKA SOUND AREAS

Some areas which had been explored by the John N. Cobb in the fall of 1950 (Schaefers 1951) were again fished during this cruise. These were Tenakee Inlet (fig. 12) and portions of Peril Strait and Sitka Sound (fig. 15). Drags in Tenakee Inlet and Fish Bay (Peril Strait) made in approximately the same locations as drags in 1950, yielded generally smaller catches than those of the previous survey. However, drag No. 74 in Tenakee Inlet produced 110 pounds of coon-stripe shrimp, which was several pounds greater than the best catch made in Tenakee Inlet in 1950. Catches from Deadman Reach (Peril Strait) and Silver Bay (Sitka Sound) were negligible, which correspond with the 1950 results.

FIG. 13 - A SMALL ICEBERG IN GLACIER BAY, ALASKA.

Results of trap sets in the same localities of Tenakee Inlet as in 1950 yielded smaller catches than those of the previous cruise (table 1).

KELP BAY AND TEBENKOF BAY AREAS

Suitable dragging bottom was limited in Kelp Bay (fig. 15) and Tebenkof Bay (fig. 7). Drags and trap sets in these regions caught few shrimp.

FIG. 14 - SHRIMP TRAPS ON THE DECK OF THE JOHN N. COBB.

AFFLECK CANAL AREA

Fishing was carried on in Affleck Canal (fig. 7) from near the head of the canal to the entrance. The bottom was predominately green mud, and no gear was damaged in this area. Catches varied from 64 to 142 pounds per hour. Three drags at depths of 74 to 96 fathoms averaged 80 pounds of predominately side-stripe shrimp and one drag in 40 to 60 fathoms produced 142 pounds of predominately pink shrimp. Most of the drags contained large quantities of bottom debris and miscellaneous trash fish.

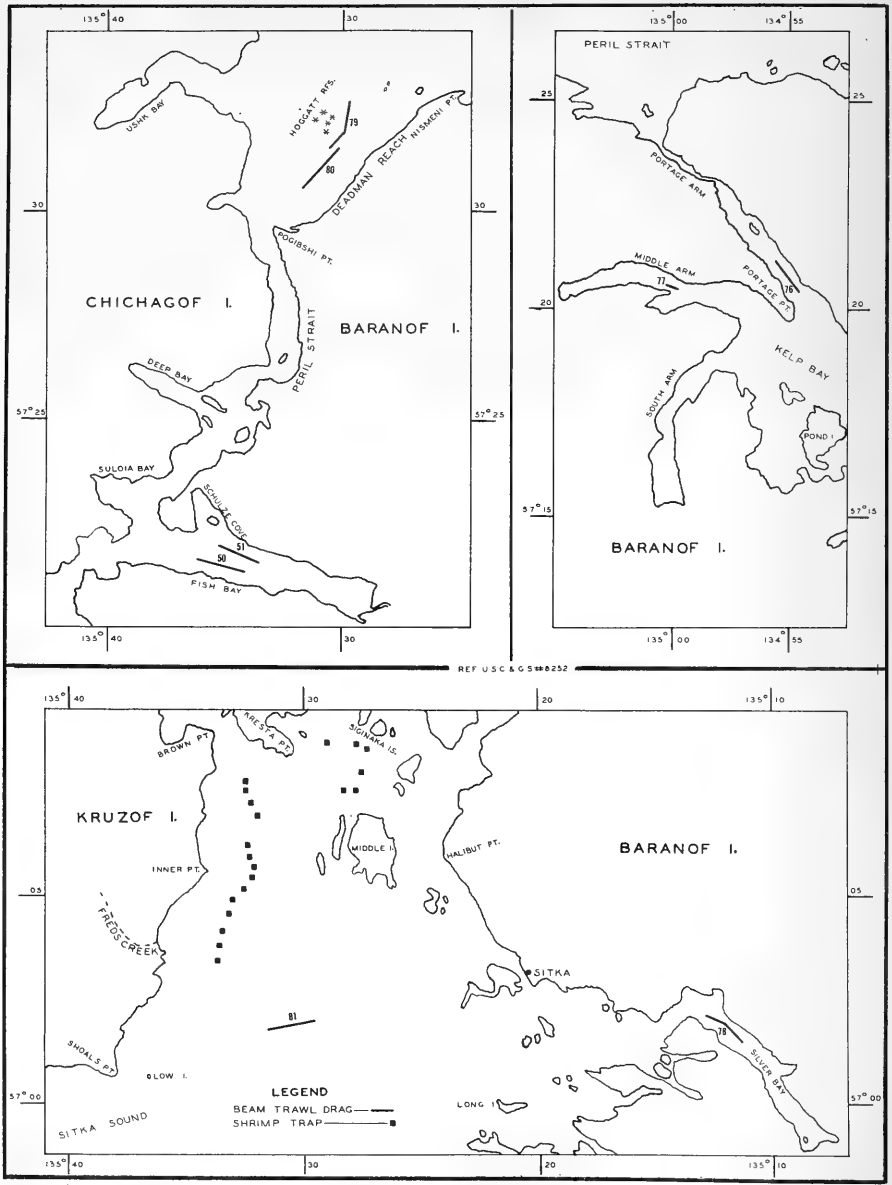

FIG. 15 - LOCATION OF BEAM-TRAWL DRAGS IN PERIL STRAIT AND KELP BAY, AND BEAM-TRAWL DRAGS AND SHRIMP-TRAP SETS IN THE SITKA SOUND AREA.

DAVIDSON INLET AND SEA OTTER SOUND

Because of the limited amount of dragging bottom in Davidson Inlet (fig. 7), only two drags were made, both of which produced insignificant quantities of shrimp.

FIG. 16 - HOISTING THE BEAM TRAWL ABOARD THE JOHN N. COBB.

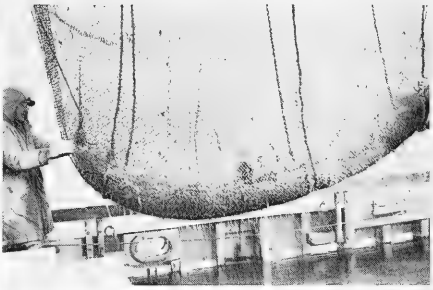

FIG. 17 - A GOOD CATCH OF SHRIMP IN THE NET BEING LOWERED TO THE DECK OF THE JOHN N. COBB.

No suitable dragging bottom was located off Heceta Island in Sea Otter Sound, and the remainder of the area was not explored. Shrimp traps set in Davidson Inlet and Sea Otter Sound had negligible results.

POINT BAKER AREA OF SUMNER STRAIT

Of the 19 shrimp traps set in the Point Baker area (fig. 7), 11 were lost. The traps were set at depths of 24 to 80 fathoms near the edges of relatively steep slopes, and those lost evidently were carried away by the swift current prevailing in the area. The eight traps recovered yielded a total of $2\frac{1}{2}$ pounds of spot shrimp.

MISCELLANEOUS CATCHES

Marine life commonly found in beam-trawl catches included the arrow-toothed flounder (Atheresthes stomias), eel pouts (Zoarcidae), flathead "sole" (Hippoglossoides elassodon), sculpins (Cottidae), sea poachers (Agonidae), and rockfish (Scorpaenidae). Small whiting (Theragra chalcogramma) were common in most areas, and tanner crab (Chionoecetes bairdii) were encountered frequently in Glacier Bay. No commercial quantities of food fish were taken.

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FOOTNOTES FOR TABLE 2

"TRACE" - LESS THAN ONE POUND OF SHRIMP.

1/ COURSES AND POSITIONS GIVEN WERE RECORDED AT THE BEGINNING OF EACH DRAG. COURSES WERE OFTEN VARIED BECAUSE OF CHANGING BOTTOM CONDITIONS.

SYMBOLS FOR TYPES OF BOTTOM

BLDS. - BOULDERS	GY. M. - GRAY MUD	S. - SAND
BK. M. - BLACK MUD	GN. M. - GREEN MUD	SH. - SHELLS
BR. M. - BROWN MUD	G. - GRAVEL	ST. - STONES
BU. M. - BLUE MUD	RKY. - ROCKY	

Table 2 - Fishing Log--Beam-Trawl Drags by the John N. Cobb in Southeastern Alaska, March-April 1952

Drag Number	1	2	3	4	5	6	7	8	9	10	11	12
Date	3/10/52	3/10/52	3/11/52	3/11/52	3/12/52	3/13/52	3/13/52	3/13/52	3/13/52	3/14/52	3/15/52	3/16/52
Latitude N.	57°51.8'	57°52.6'	57°54.7'	57°56.0'	57°58.7'	57°59.1'	57°54.6'	57°54.9'	57°56.0'	57°52.0'	57°53.8'	57°52.6'
Longitude W.	136°04.9'	136°06.4'	136°10.0'	136°11.9'	136°16.1'	136°16.0'	136°17.2'	136°18.4'	136°11.9'	136°25.2'	136°23.7'	136°06.4'
Course, Magnetic[1/]	288°	288°	293°	277°	117°	107°	116°	272°	277°	356°	355°	288°
Depth Range in Fathoms	20-30	38-43	60-72	74-80	82-85	46-50	40-50	52-68	74-80	126-136	118-140	38-43
Type of Bottom	gn. M.	gn. M. & Sh.	gn. M.	gn. M.	gn. M.	gn. M. & St.	gn. M. & St.	gn. M.	gn. M.	gn. M.	gn. M.	gn. M. & Sh.
Trawling Bottom	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Tide	High slack	Ebb	Flood	Flood	High slack	Low slack	Flood	Flood	Ebb	Ebb	Low slack	Ebb
Time on Bottom in Minutes	30	30	30	30	30	30	30	33	30	30	30	30
Shrimp Catch in Pounds: (SIZE--NUMBER OF WHOLE SHRIMP PER POUND--APPEARS IN PARENTHESES)												
Pink	-	-	-	-	15(99)	Trace	-	-	Trace	-	Trace	-
Side-stripe	-	-	-	-	20(39)	-	-	-	4(30)	2(25)	5(34)	-
Coon-stripe	-	-	-	-	-	-	Trace	-	-	-	-	-
Spot	-	-	-	-	Trace	Trace	Trace	-	-	-	-	-
Total Shrimp Catch in Pounds	-	-	-	-	35	-	-	-	4	2	5	-
Total Shrimp Catch Hourly Basis	-	-	-	-	70	-	-	-	8	4	10	-
Remarks	-	Net not on bottom	Net not on bottom	Net not on bottom	-	-	-	-	-	-	-	-

Drag Number	13	14	15	16	17	18	19	20	21	22	23	24
Date	3/16/52	3/16/52	3/17/52	3/17/52	3/17/52	3/18/52	3/18/52	3/18/52	3/18/52	3/19/52	3/19/52	3/19/52
Latitude N.	47°54.7'	58°00.7'	58°08.2'	58°09.5'	58°09.5'	58°07.3'	58°08.1'	58°09.3'	58°27.3'	58°37.6'	58°37.2'	58°43.4'
Longitude W.	136°10.0'	136°19.0'	136°19.3'	136°19.8'	136°19.6'	136°17.5'	136°19.6'	136°21.1'	135°54.2'	136°26.2'	136°26.1'	136°23.0'
Course, Magnetic[1/]	293°	295°	312°	116°	114°	116°	287°	315°	178°	013°	217°	114°
Depth Range in Fathoms	60-72	80-85	64-80	60-68	48-55	15-26	80	80-90	25-30	64-68	52-56	104-108
Type of Bottom	gn. M.	gn. M.	bu. M.	bu. M.	bu. M. & "Clay pipe"	gn. M. & St.	bu. M.	bu. M.	M.	gy. M.	gy. M.	gy. M.
Trawling Bottom	Clear	Clear	Clear	Clear	Snag	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Tide	Low slack	Ebb	Ebb	Flood	Flood	Ebb	Ebb	Ebb	Flood	Ebb	Ebb	Flood
Time on Bottom in Minutes	30	30	30	30	21	30	30	30	30	30	30	30
Shrimp Catch in Pounds: (SIZE--NUMBER OF WHOLE SHRIMP PER POUND--APPEARS IN PARENTHESES)												
Pink	Trace	4(112)	62(83)	52(67)	-	-	Trace	Trace	3(163)	113(128)	118(142)	84(101)
Side-stripe	Trace	9(34)	24(29)	Trace	-	-	2½(32)	15(26)	Trace	Trace	-	56(38)
Coon-stripe	-	-	-	-	-	-	-	-	-	8(21)	22(20)	Trace
Spot	-	Trace	-	-	-	-	-	-	-	-	-	-
Total Shrimp Catch in Pounds	-	13	86	52	-	-	2½	15	3	121	140	140
Total Shrimp Catch Hourly Basis	-	26	172	104	-	-	5	30	6	242	280	280
Remarks	-	-	-	-	Net torn	-	-	-	-	-	-	-

NOTE: FOR EXPLANATION OF FOOTNOTES, SEE P. 13.

Table 2 - Fishing Log--Beam-Trawl Drags by the John N. Cobb in Southeastern Alaska, March-April 1952 (Contd.)

Drag Number	25	26	27	28	29	30	31	32	33	34	35	36
Date	3/19/52	3/20/52	3/20/52	3/21/52	3/21/52	3/25/52	3/25/52	3/26/52	3/26/52	3/27/52	3/27/52	3/27/52
Latitude N.	58°44.0'	58°42.2'	58°39.0'	58°36.2'	58°39.2'	58°46.0'	58°45.6'	58°55.0'	58°54.8'	58°55.4'	58°56.1'	58°55.3'
Longitude W.	136°23.6'	136°21.2'	136°23.0'	136°20.2'	136°15.0'	136°34.8'	136°33.6'	136°32.1'	136°32.2'	136°33.5'	136°33.1'	136°37.3'
Course, Magnetic[1]	096°	126°	087°	126°	314°	090°	085°	140°	141°	158°	136°	130°
Depth Range in Fathoms	104-106	108-112	80-88	62	80	48	52-54	88-92	88-94	81-90	72-80	92
Type of Bottom	gy. M.	gy. M.	gy. M.	Rky.	gn. M. & Blds.	gy.- bu. M.	gy.-bu. M. & Blds.	gy. M. & St.	gy. M. & St.	gy. M.	gy. M.	gy. M.
Trawling Bottom	Snag	Clear	Snag	Snag	Snag	Snag	Snag	Soft	Clear	Clear	Clear	Soft
Tide	Flood	High slack	Ebb	Flood	High slack	Flood	High slack	Flood	Flood	Ebb	Low slack	Flood
Time on Bottom in Minutes	20	30	30	17	11	08	30	08	30	30	30	10
Shrimp Catch in Pounds: (1/ Pink--Number of whole shrimp per pound--Appears in parenthesis)												
Pink	96(92)	36(94)	34(97)	-	Trace	-	27(121)	12(114)	42(107)	52(88)	57(137)	70(87)
Side-stripe	36(31)	27(32)	Trace	Trace	8(22)	-	Trace	8(141)	36(33)	88(141)	28(59)	-
Coon-stripe	-	-	Trace	-	-	-	5(40)	-	-	-	Trace	-
Spot	-	-	-	-	-	-	-	-	-	-	-	-
Total Shrimp Catch in Pounds	132	63	34	-	8	-	32	20	78	140	85	70
Total Shrimp Catch Hourly Basis	396	126	68	-	44	-	64	150	156	280	170	420
Remarks	Net mudded down	-	Net torn	Net torn	Beam broke	Net torn	Net torn	Net mudded down after 8 minutes	Much mud in net	Much mud in net	Much mud in net	Some shrimp dead. Net mudded down

Drag Number	37	38	39	40	41	42	43	44	45	46	47	48
Date	3/27/52	3/27/52	3/27/52	3/27/52	3/28/52	3/28/52	3/29/52	3/29/52	3/29/52	3/29/52	3/30/52	3/30/52
Latitude N.	58°59.0'	59°00.7'	58°57.8'	58°57.8'	58°54.2'	58°53.7'	58°53.4'	58°47.9'	58°47.9'	58°46.0'	58°48.6'	58°46.6'
Longitude W.	136°41.2'	136°42.9'	136°39.8'	136°39.8'	136°32.7'	136°35.9'	136°05.0'	136°06.4'	136°06.4'	136°02.9'	136°06.2'	136°05.7'
Course, Magnetic[1]	116°	138°	125°	125°	145°	308°	160°	329°	329°	125°	321°	125°
Depth Range in Fathoms	80	56-63	100	100	90-92	90-92	164	51-62	51-62	104	52-70	36-62
Type of Bottom	gy. M. & St.	gy. M. & St.	gy. M.	gy. M.	gy. M. & St.	gy. M. & St.	gy. M.	gy. M.	gy. M.	gy. M.	gy. M. & St.	gy. M.
Trawling Bottom	Soft	Soft	Clear	Clear	Soft & St.	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Tide	Flood	Flood	High slack	Ebb	Low slack	Flood	Low slack	Flood	Flood	High slack	Ebb	Low slack
Time on Bottom in Minutes	08	09	30	30	17	30	30	30	30	30	40	30
Shrimp Catch in Pounds: (1/ Pink--Number of whole shrimp per pound--Appears in parenthesis)												
Pink	8(108)	35(134)	-	Trace	10(90)	35(101)	Trace	6(138)	18(144)	62(122)	94(151)	21(143)
Side-stripe	Trace	Trace	-	Trace	12(36)	27(32)	Trace	8(26)	84(30)	Trace	58(31)	Trace
Coon-stripe	Trace	Trace	-	-	-	-	-	-	-	-	-	-
Spot	-	-	-	-	-	-	-	-	-	-	-	-
Total Shrimp Catch in Pounds	8	35	-	-	22	62	-	14	102	62	152	21
Total Shrimp Catch Hourly Basis	60	233	-	-	78	124	-	28	204	124	228	42
Remarks	Net mudded down	Net mudded down	Net not on bottom	Shrimp dead	Net mudded down	-	Shrimp dead	Net fouled on beam	End of net fouled on beam	-	-	-

NOTE: FOR EXPLANATION OF FOOTNOTES, SEE P. 13.

Table 2 - Fishing Log--Beam-Trawl Drags by the John N. Cobb in Southeastern Alaska, March-April 1952 (Contd.)

Drag Number	49	50	51	52	53	54	55	56	57	58	59	60
Date	3/30/52	3/31/52	3/31/52	4/3/52	4/3/52	4/3/52	4/4/52	4/4/52	4/4/52	4/4/52	4/4/52	4/4/52
Latitude N.	58°42.3'	57°22.3'	57°22.9'	58°40.5'	58°41.4'	58°41.9'	58°45.9'	58°46.1'	58°46.0'	58° 41.2'	58°42.0'	58°44.4'
Longitude W.	136°03.8'	135°34.1'	135°35.3'	136°01.0'	136°02.5'	136°06.0'	136°06.0'	136°06.2'	136°06.6'	136°05.6'	136°05.9'	136°06.5'
Course, Magnetic[1]	309°	216°	081°	291°	292°	170°	151°	165°	169°	214°	304°	108°
Depth Range in Fathoms	85-88	40-44	34-38	92-94	92-96	80-82	64-74	60	50	60	60	70-84
Type of Bottom	gy. M.	br.-gn. M. & Sh.	br.-gn. M. & Sh.	gy. M.	gy. M.	gy. M.	gy. M.	gy. M.	gy. M.	gy. M.	gy. M. & Blds.	gy. M.
Trawling Bottom	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Snag	Clear
Tide	Flood	Flood	Flood	Ebb	Ebb	Low slack	Flood	High slack	Ebb	Ebb	Ebb	Low slack
Time on Bottom in Minutes	30	30	30	30	30	30	30	30	30	30	30	60
Shrimp Catch in Pounds: (Size--Number of whole shrimp per pound--Appears in parentheses):												
Pink	32(103)	7(138)	-	35(120)	41(111)	83(74)	76(88)	155(100)	102(146)	98(84)	59(80)	217(73)
Side-stripe	60(34)	-	-	37(31)	33(34)	77(38)	7(43)	8(40)	Trace	22(24)	3(30)	88(33)
Coon-stripe	-	-	Trace	Trace	-	-	-	Trace	Trace	6(38)	5(31)	-
Spot	-	-	Trace	-	-	-	-	-	-	-	-	-
Total Shrimp Catch in Pounds	92	7	-	72	74	160	83	163	102	126	67	305
Total Shrimp Catch Hourly Basis	184	14	-	144	148	320	166	326	204	252	134	305
Remarks	-	-	-	-	-	-	-	-	-	-	Net torn	-

Drag Number	61	62	63	64	65	66	67	68	69	70	71	72
Date	4/5/52	4/5/52	4/5/52	4/5/52	4/5/52	4/6/52	4/6/52	4/6/52	4/6/52	4/8/52	4/8/52	4/9/52
Latitude N.	58°42.0'	58°44.0'	58°40.8'	58°38.6'	58°37.2'	58°40.0'	58°39.0'	58°33.7'	58°39.3'	58°43.6'	58°36.2'	57°53.0'
Longitude W.	136°00.7'	135°59.9'	135°58.2'	135°57.8'	135°56.7'	136°01.1'	136°02.0'	136°03.8'	136°21.6'	136°06.6'	136°01.1'	135°32.7'
Course, Magnetic[1]	153°	292°	135°	117°	114°	186°	118°	309°	021°	126°	350°	097°
Depth Range in Fathoms	68-74	88-98	138	138	138	80-88	88-94	58-64	86-88	80-86	90-96	72-74
Type of Bottom	gy. M.	bu. M.	bu. M.	bu. M.	gy. M.	gy. M.	gy. M.	Rky.	gy. M.	gy. M.	gy. M. & St.	br. M.
Trawling Bottom	Clear	Snag	Clear	Clear	Clear	Clear	Clear	Snag	Snag	Clear	Clear	Clear
Tide	Flood	High slack	Ebb	Ebb	Ebb	Flood	Flood	High slack	Ebb	Flood	Flood	Ebb
Time on Bottom in Minutes	60	30	30	30	30	30	30	30	13	60	30	30
Shrimp Catch in Pounds: (Size--Number of whole shrimp per pound--Appears in parentheses):												
Pink	164(115)	67(117)	6(80)	2(80)	Trace	53(117)	51(107)	-	68(101)	198(113)	Trace	Trace
Side-stripe	11(44)	11(50)	37(31)	17(31)	17(25)	62(29)	51(30)	-	7(48)	132(32)	Trace	-
Coon-stripe	6(24)	Trace	-	-	-	Trace	-	-	-	-	Trace	-
Spot	Trace	-	-	-	-	-	-	-	-	-	-	-
Total Shrimp Catch in Pounds	181	78	43	19	17	115	102	-	75	330	-	-
Total Shrimp Catch Hourly Basis	181	156	86	38	34	230	204	-	346	330	-	-
Remarks	-	Net torn	-	-	-	-	-	Beam broke	Beam broke hung up	-	Net flipped over beam	-

NOTE: FOR EXPLANATION OF FOOTNOTES, SEE P. 13.

Table 2 - Fishing Log--Beam-Trawl Drags by the John N. Cobb in Southeastern Alaska, March-April 1952 (Contd.)

Drag Number	73	74	75	76	77	78	79	80	81	82	83	84
Date	4/10/52	4/10/52	4/10/52	4/11/52	4/11/52	4/14/52	4/16/52	4/16/52	4/17/52	4/20/52	4/22/52	4/22/52
Latitude N.	57°47.8'	57°56.5'	57°58.7'	57°21.2'	57°20.6'	57°02.1'	57°33.5'	57°32.4'	57°01.8'	56°21.1'	56°13.4'	56°12.6'
Longitude W.	135°18.9'	135°15.5'	135°19.6'	134°55.5'	135°00.1'	135°12.9'	135°29.6'	135°30.1'	135°31.5'	134°08.8'	134°05.1'	134°05.0'
Course, Magnetic 1/	100°	220°	105°	112°	083°	088°	160°	191°	049°	114°	159°	162°
Depth Range in Fathoms	86-88	42-54	34-38	50-66	92-96	46-48	44-47	44-45	63-65	18-20	66-72	78-82
Type of Bottom	br. M.	bk. M.	bk. M. & Sh.	gn. M.	bk. M.	gn. M.	gn. M. & G.	gn. M. & Sh.	gn. M.	gn. M.	br. M.	br. M.
Trawling Bottom	Clear	Clear	Clear	Clear	Soft M.	Clear	Clear	Clear	Snag	Clear	Soft M.	Clear
Tide	Low slack	Flood	High slack	Flood	High slack	Low slack	Low slack	Flood	Flood	Flood	Flood	Flood
Time on Bottom in Minutes	30	30	30	30	05	30	30	30	27	30	25	30
Shrimp Catch in Pounds: (U.S. NUMBER OF WHOLE SHRIMP TO A POUND--APPEARS IN PARENTHESES)												
Pink	Trace	Trace	Trace	Trace	Trace	Trace	Trace	-	3(72)	-	2¾(68)	Trace
Side-stripe	Trace	-	-	-	Trace	-	-	-	-	-	1½(37)	3½(36)
Coon-stripe	-	55(35)	22(34)	Trace	-	-	2⅜(61)	-	-	-	-	-
Spot	-	-	-	Trace	-	-	3½(15)	-	-	-	Trace	Trace
Total Shrimp Catch in Pounds	-	55	22	-	-	-	6¼	-	3	-	4¼	3½
Total Shrimp Catch Hourly Basis	-	110	44	-	-	-	12½	-	6⅔	-	10	7
Remarks	-	-	-	-	Mudded down	-	-	-	Hung up	-	Mudded down	-

Drag Number	85	86	87	88	89	90	91	92	93	94	95	96
Date	4/22/52	4/22/52	4/22/52	4/23/52	4/23/52	4/23/52	4/23/52	4/23/52	4/25/52	4/25/52	4/25/52	4/26/52
Latitude N.	56°11.2'	56°14.7'	56°13.5'	56°16.3'	56°09.2'	56°08.2'	56°07.0'	56°05.6'	56°07.1'	56°02.5'	55°54.6'	55°57.6'
Longitude W.	134°05.2'	134°03.9'	134°04.2'	134°04.0'	134°04.9'	134°04.3'	134°04.0'	134°04.0'	134°02.8'	134°05.0'	133°35.4'	133°31.2'
Course, Magnetic 1/	155°	161°	154°	143°	132°	138°	167°	160°	171°	155°	167°	023°
Depth Range in Fathoms	88-96	74-78	76-78	40-60	96-134	96-100	92-100	76-86	52-64	72	56-60	64-70
Type of Bottom	gn.-gy. M.	gn.-gy. M.	gn.-gy. M.	gn. M.	gn. M.	gn. M.	gn. M.	gn. M.	gn. M.	G.	gn. S. & G.	gn. M.
Trawling Bottom	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Tide	Flood	High slack	Ebb	Flood	Flood	High slack	Ebb	Ebb	Low slack	Flood	Ebb	Ebb
Time on Bottom in Minutes	30	30	30	30	30	30	30	30	30	30	30	30
Shrimp Catch in Pounds: (U.S. NUMBER OF WHOLE SHRIMP TO A POUND--APPEARS IN PARENTHESES)												
Pink	2(136)	4(77)	5(112)	71(90)	Trace	Trace	-	-	Trace	2(87)	9(93)	1(78)
Side-stripe	38(49)	34(37)	37(39)	Trace	9(44)	35(40)	50(40)	42(40)	30½(24)	6(40)	-	1½(33)
Coon-stripe	-	-	-	Trace	-	-	-	-	-	-	-	-
Spot	-	-	-	-	-	Trace	-	-	1¼(15)	Trace	4¾(28)	-
Total Shrimp Catch in Pounds	40	38	42	71	9	35	50	42	32	8	13¾	2½
Total Shrimp Catch Hourly Basis	80	76	84	142	18	70	100	84	64	16	27½	5
Remarks	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: FOR EXPLANATION OF FOOTNOTES, SEE P. 13.

Table 3 - Shrimp Trap Catches by John N. Cobb, March-April 1952

Area	Set Number	Date	Tide	Depth in Fathoms	Number of Traps	Total Hours Out	Bait	Shrimp Catch				Total Shrimp Catch in Pounds	Remarks
								Spot Shrimp		Coon-stripe Shrimp			
								Pounds1/	No. of whole shrimp per lb.	Pounds1/	No. of whole shrimp per lb.		
Keku Strait off Pup Island	1	3/8/52 - 3/9/52	Flood	56	8	25	Frozen herring	(5)	-	23	(41)	23	Few pink shrimp.
Keku Strait off Keku Island	1-A	3/8/52 - 3/9/52	Ebb	46	8	21	Frozen herring	18½	(18)	2	(70)	20½	Hermit crabs common.
Lisianski Inlet - Soloma Point	2	3/10/52 - 3/11/52	Ebb	14 - 35	12	24	Frozen herring	-	-	-	-	-	----
Lisianski Inlet - Near drag No. 4 to off Miner Island	2-A	3/11/52 - 3/12/52	High slack	17 - 80	19	29	Frozen herring	(22)	(45)	-	-	(22)	Few pink shrimp.
Lisianski Inlet - Near drag No. 5 to Junction Island	2-B	3/12/52 - 3/13/52	Flood	38 - 88	14	31	Frozen herring	(6)	(32)	-	-	(6)	Few pink shrimp, gastropods common.
Lisianski Strait - Stag Bay	2-C	3/13/52 - 3/14/52	Flood	24 - 60	22	25	Frozen herring	4½	(10)	-	-	4½	Few pink shrimp, 5 starfish.
Lisianski Strait - Between Stag Bay and Rock Point	2-D	3/14/52 - 3/15/52	Flood	23 - 62	13	23	Frozen herring	(5)	-	-	-	(5)	Hermit crabs, gastropods and starfish common.
Lisianski Strait - Near Lost Cove	2-E	3/14/52 - 3/15/52	High slack	30 - 90	18	22	Frozen herring	(24)	(48)	-	-	-	Sea urchins common.
Near end of drag No. 14 to entrance	2-F	3/15/52 - 3/16/52	Ebb	30 - 79	20	23	Frozen herring	4	(20)	-	-	4	Few pink shrimp.
Port Althorp	3	3/17/52 - 3/18/52	Ebb	35 - 68	19	29	Frozen herring	-	-	-	-	-	Few pink shrimp, starfish common.
Hugh Miller Inlet	4	3/21/52 - 3/22/52	Ebb	24 - 42	19	23	Frozen herring	-	-	25	(29)	25	Few pink shrimp.
Adams Inlet	4-A	3/29/52 - 3/30/52	Ebb	32 - 45	6	24	Frozen herring	-	-	2	(39)	2	Few pink shrimp.
Beardslee Islands	4-B	4/7/52 - 4/8/52	Ebb	8 - 45	13	23	Frozen herring	(1)	-	19¾	(43)	19¾	Few hermit crabs.
Between Crab and Saltery Bay	5	4/9/52 - 4/10/52	High slack	19 - 41	13	20	Frozen herring	11½	(23)	2¾	(56)	14¼	Few hermit crabs.
Tenakee Inlet, Near drag No. 74.	5-A	4/9/52 - 4/10/52	Ebb	17 - 38	7	23	Frozen herring	2	(10)	10¾	(47)	12¾	----
Between Saltery and Seal Bay	5-B	4/9/52 - 4/10/52	High slack	16 - 32	6	28	Frozen herring	(10)	-	(15)	-	-	Spider crabs common.
Off Entrance of Seal Bay	5-C	4/9/52 - 4/10/52	Ebb	20 - 36	6	28	Frozen herring	6¼	(15)	¾	(52)	7	Spider crabs common.
Sitka Sound, East Coast of Krusof Island and off Siginaka Islands	6	4/17/52 - 4/18/52	Flood	24 - 72	23	20	Frozen herring	(2)	-	(4)	-	-	Hermit crabs common.
Entrance Tebenkof Bay	7	4/19/52 - 4/20/52	High slack	30 - 64	27	25	Frozen herring	1	(25)	-	-	1½	Hermit crabs common.
Tebenkof Bay - Troller Islands	7-A	4/20/52 - 4/21/52	Ebb	20 - 60	20	18	Frozen herring	1½	(20)	-	-	1½	Few pink shrimp, hermit crabs common.
Sea Otter Sound, Gas Rock	8	4/25/52 - 4/26/52	High slack	22 - 64	28	21	Frozen herring	-	-	-	-	-	Hermit crabs common.
Davidson Inlet, Green Island to Van Sant Cove	8-A	4/26/52 - 4/27/52	Flood	24 - 64	28	23	Frozen herring	1¼	(23)	-	-	1¼	----
Sumner Strait - Point Baker area	9	4/27/52 - 4/28/52	High slack	24 - 80	19	22	Frozen herring	⅜	(16)	-	-	⅜	11 traps lost.

1/ FIGURES IN PARENTHESES REPRESENT NUMBERS OF SHRIMP INSTEAD OF WEIGHT IN POUNDS.

ALASKA'S SHRIMP INDUSTRY

By Norman B. Wigutoff*

INTRODUCTION

One of the oldest operating fishery industries in Alaska is the shrimp fishery. Started in the vicinity of Petersburg, Alaska, in 1915, it has continued to be one of the most important "off-season" fisheries in the Territory. The primary and most important fisheries of Alaska--salmon and halibut--are of extremely short duration and occur in the summer months. But the shrimp fishery could be exploited on a year-round basis except for a short closed season (established by Federal regulations) in certain areas of Southeastern Alaska from February 15 through April 30.

FIG. 1 - SOUTHEASTERN ALASKA. PETERSBURG AND WRANGELL HAVE BEEN THE CENTER OF THE ALASKA SHRIMP FISHERY FOR THE PAST 30 YEARS.

SPECIES OF SHRIMP

Although numerous species of shrimp from Alaska have been identified (Hynes 1930), these five are of major importance in the commercial shrimp fishery:

1. Pink, Pandalus borealis.
2. Side-stripe, Pandalopsis dispar.
3. Humpy, Pandalus goniurus
4. Spot or prawn, Pandalus platyceros.
5. Coon-stripe, Pandalus hypsinotus.

Of these, the first three make up from 85 to 95 percent of the commercial catch divided almost equally among them. The sizes of the pink and humpy vary from about 60 to 150 whole shrimp per pound. Side-stripe range from 20 to 75 whole shrimp per pound. The spot or prawn are the largest, averaging 8 to 10 whole shrimp per pound. Coon-stripe run about 30 to 50 whole shrimp per pound.

CATCH AND FISHING AREAS

The average annual shrimp catch for 1940 through 1945 was around 900,000 pounds. From 1946 through 1951 Alaska shrimp fishermen made an average annual catch of 2,146,000 pounds. The highest annual catch of shrimp in Alaska was 2,835,000 pounds in 1948.

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Unlike the shrimp fishery in the Gulf of Mexico, which is carried on in open waters, shrimp fishing in Alaska is conducted in "inside" waters. Most fishing

FIG. 2 - TYPICAL ALASKA SHRIMP TRAWLER PREPARING TO "SET" THE BEAM TRAWL.

is done in glacial bays with shallow mouths, near the flats off the mouths of large rivers, and near banks along open channels and inlets.

For 30 years the shrimp fishery of southeastern Alaska has centered about Petersburg and Wrangell. The shrimp operators in these towns have, at times, attempted to explore other grounds, but have never found sufficient shrimp populations to warrant expansion of the industry to other places. From time to time attempts have been made by the industry to extend operations into central Alaska,

FIG. 3 - SHRIMP BEAM TRAWL BEING RAISED FROM WATER.

FIG. 4 - BRAILING SHRIMP FROM THE BEAM TRAWL.

especially in Prince William Sound, where the same species of shrimp are known to occur. So far these attempts have proved unsuccessful. On occasion, an individual fishing boat is outfitted with a beam trawl and a few hundred pounds of shrimp are landed in Cordova. This is infrequent and sporadic and no consistent fishery has yet been established there.

SHRIMP EXPLORATIONS

In 1947, after the explorations reported by Carlson (1945), a small shrimp fishery was started at Tokeen, on the west coast of Prince of Wales Island. That

FIG. 5 - THE SHRIMP IS DUMPED ONTO A SORTING TABLE.

FIG. 6 - GETTING READY TO HOIST BOXES OF WHOLE SHRIMP TO LANDING DOCK OF PROCESSING PLANT.

operation is doing very well and shows promise of continuing. As a result of shrimp explorations by the U. S. Fish and Wildlife Service exploratory vessel John N. Cobb (Schaefers 1951, and Ellson and Livingstone 1952), additional commercially-exploitable areas have been found in southeastern Alaska, notably in Glacier Bay and inlets adjacent to Icy Strait.

FISHING METHOD

Beam trawling has been and still is the method used to capture the shrimp. A beam trawl is a partially tapered bag of netting spread apart at the mouth by a

FIG. 7 - UNLOADING BOXES OF WHOLE SHRIMP AT THE PROCESSING PLANT.

FIG. 8 - COOLING RACKS FOR TRAYS OF WHOLE COOKED SHRIMP AND FOR COOKED MEATS.

beam or timber. The trawl is set on the bottom and towed behind the vessel. After an hour or two it is hauled up, the shrimp are brailed out and stored whole on deck in wooden boxes holding from 150 to 200 pounds each. Because of prevailing cool air temperatures and the fact that shrimp are landed daily, no ice is used. The shrimp trawlers usually leave port in the very early hours of the morning and return to the processing plants with their catches in the late afternoon or early evening. A complete and detailed description of the fishing vessels, the beam trawl, and the fishing method, is given in a report on experimental and exploratory shrimp fishing conducted in 1944 by the Alaska Fisheries Experimental Commission (Carlson 1945). Ellson and Livingstone (1952) describe a smaller trawl used in exploratory fishing operations. Collapsible shrimp traps were also used in the explorations of the John N. Cobb, and are described in detail by Ellson and Livingstone.

PROCESSING AND MARKETING PROCEDURES

The method of processing the shrimp in the plants has been the same for a number of years. As soon as a boat arrives at the plant, the boxes of shrimp are unloaded from the deck of the fishing vessel. The whole shrimp are immediately precooked, one boxful at a time, in a tank of fresh boiling water heated by direct

FIG. 9 - PICKING ROOM WHERE MEATS ARE PICKED FROM WHOLE COOKED SHRIMP.

FIG. 10 - REMOVING TRAYS OF PICKED MEATS FROM BRINE COOKER.

injection of live steam. The precook to simplify picking is as short as possible and is judged sufficient when the shrimp rise to the surface and float. As the whole shrimp rise to the surface, they are skimmed off with a short dip net and put into small wooden trays with galvanized wire-mesh bottoms. Each tray holds 20 to 25 pounds. The trays are placed in cooling racks until the following morning, when they are moved into the picking room as needed. Women, many of them Alaska natives, are mainly employed in the picking operation. The meats are picked from the shells and again placed in the cooling trays. Pickers are paid by the weight of meat picked. Because the fishermen are paid on the weight of the cooked meats picked from their catch, each boat's catch is kept separate when processed. The trays of picked meats are washed under cold potable fresh water sprayed by a hose or faucet, and permitted to drain on the racks for a few minutes.

After picking and washing, the meats have a bland flavor and need salt. The industry practices two different methods for the further processing of the meats. The most commonly used method is to cook the trays full of meats in a strong salt solution (25°-30° salometer) for a very short period--from one to three minutes.

This is also done in a vat or tank heated by direct injection or closed coils of live steam. The other method is to first dip the trays of picked meats in a saturated salt solution for about three minutes. After the dip, the trays of meats are allowed to drain. Then the trays are placed in a steam retort and cooked without pressure for 3 to 4 minutes. There is some slight variation from plant to plant, and even from day to day in the same plant, in the cooking time and the strength of brines used. After brining and cooking, the shrimp meats are cooled in the trays on the racks for several hours, or overnight. To remove fragments of shell and antennae or "feelers," the meats are then put through a combination shaking and blowing machine or a rotating drum and blower, of which there are about as many different designs as there are processing plants. From the mechanical cleaning machines, the meats are taken to the packing room. Approximately 35 pounds of cooked meats are obtained from 100 pounds of raw whole shrimp.

FIG. 11 - BRINE COOKED MEATS PUT THROUGH A REVOLVING SHAKER OR ROTARY DRUM AND BLOWER TO REMOVE FRAGMENTS OF SHELL AND ANTENNAE OR "FEELERS." NOTE CONVEYOR ON THE RIGHT WHICH TAKES CLEANED MEATS TO PACKING ROOM.

For many years, until about 1940, the shrimp meats were packed dry, 5 pounds to a one-gallon can, and shipped in ice by steamship to Seattle brokers, who distributed the perishable product as far east as the Rocky Mountain area. With the advance in the use of freezing in the last several years, the industry has now changed almost completely to marketing its products in the dry frozen state. Freezing is accomplished at temperatures between 0° and 10° F. Most Alaska freezers are the shelf type. One operator, however, ships all his production fresh by air to Seattle. The largest volume of shrimp meats is packed in No. 10 double-seamed cans, 5 pounds of meats per can, for the hotel and restaurant trade. In recent years, with the increased use of frozen products in the home, the shrimp industry of Alaska has turned to one pound and even smaller containers. Very recently the "tuna" can (known in the canning trade as a 307 x 113), has been adopted for a consumer-size package containing four ounces of shrimp meat sealed under vacuum. Vacuum packing yields a product with a superior storage life and minimizes the toughening and loss of flavor of the shrimp during long frozen-storage periods. Enamel-lined cans are used.

FIG. 12 - PACKING AND WEIGHING NO. 10 CANS. EACH CAN CONTAINS FIVE POUNDS OF MEATS.

Some shrimp are marketed in other forms than as cooked picked meats. These are:

Spot shrimp - Cooked whole and frozen, packaged in paper boxes, 20 pounds per box.

Large side-stripe shrimp - Frozen raw picked meats, packed 6 pounds per No. 10 can, hermetically sealed, 6 cans to the case.

All Alaska shrimp are marketed normally within six months after packing. Seattle remains the wholesale marketing center for Alaska shrimp from where they are distributed on the Pacific coast and into the Rocky Mountain states. Wholesale prices in 1951 and 1952 varied from $1.10 to $1.25 per pound for the frozen cooked and peeled meats. The uncooked packs have been selling at wholesale between 85 cents and $1.00 per pound.

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TUNA AND SHRIMP SHRINKAGE DURING CANNING

Canning experiments showed that the shrinkage of tuna meat during heat processing depended little on the sterilizing value of the process used. Shrimp, however, shrunk more with increasing the sterilizing value of the process. The increase in shrinkage gradually fell off when the sterilizing effect of the heat process approached the values which should be used commercially. (Report of the Technological Laboratory of the Danish Ministry of Fisheries, 1951.)

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FREEZING FISH AT SEA--NEW ENGLAND

Part 6 - Changes and Additions to Experimental Equipment on the Trawler Delaware

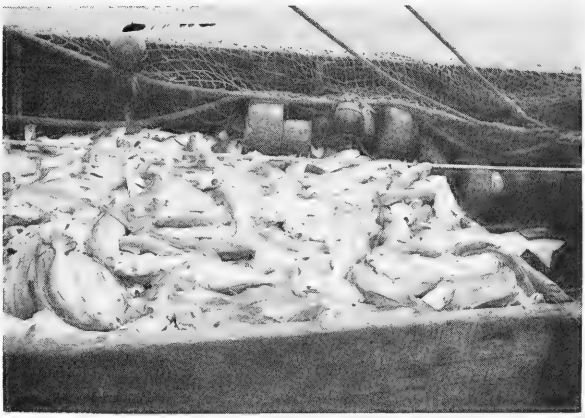
By C. G. P. Oldershaw*

ABSTRACT

THE COLD-STORAGE CAPACITY OF THE EXPERIMENTAL TRAWLER DELAWARE WAS INCREASED, AND SEVERAL CHANGES AND ADDITIONS WERE MADE TO THE EXPERIMENTAL FREEZING EQUIPMENT AND REFRIGERATION MACHINERY.

INTRODUCTION

The freezing-fish-at-sea project currently in progress at the Boston Fishery Technological Laboratory of the U. S. Fish and Wildlife Service's Branch of Commercial Fisheries has these general objectives: (a) the development of handling, freezing, and storage facilities which can be installed and used successfully on existing vessels of the New England fleet, and (b) the establishment of the technological and economic feasibility of freezing fish "in the round" at sea for later processing ashore.



LOAD OF HADDOCK ON DECK OF DELAWARE PRIOR TO FREEZING.

The experimental equipment installed by this laboratory on the trawler Delaware has been described in Part 3 of this series (Butler, Puncochar, and Knake 1952). As a result of experience gained during the 1951 season, several changes and additions were made to increase the efficiency of the operation. These changes and additions, made during the vessel's 1951/52 winter lay-up period (and tested during the 1952 operating season), are described herein.

EQUIPMENT CHANGES AND ADDITIONS

INCREASE IN COLD-STORAGE CAPACITY: The cold-storage space for frozen fish was increased by approximately 1,000 cubic feet with the addition of another insulated bulkhead in the iced-fish storage space (see figure 1). Construction details were similar to the forward bulkhead previously described (Butler, et al 1952). Located two pen-sections forward of the existing forward bulkhead, the new bulkhead

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encloses a space approximately ten feet fore and aft, across the full width of the vessel. Both bulkheads enclosing this space are fitted with refrigerator doors to provide access from either the cold-storage space aft or the single remaining iced-fish storage pen, forward. A deck hatch, part of the ship's original structure, provides access for unloading the frozen fish.

The original fish hold (7 five-foot pen-sections in length) is now partitioned as follows: one pen-section forwardmost for storing iced gutted fish; two pen-sections insulated and refrigerated for storing round frozen fish; three pen-sec-

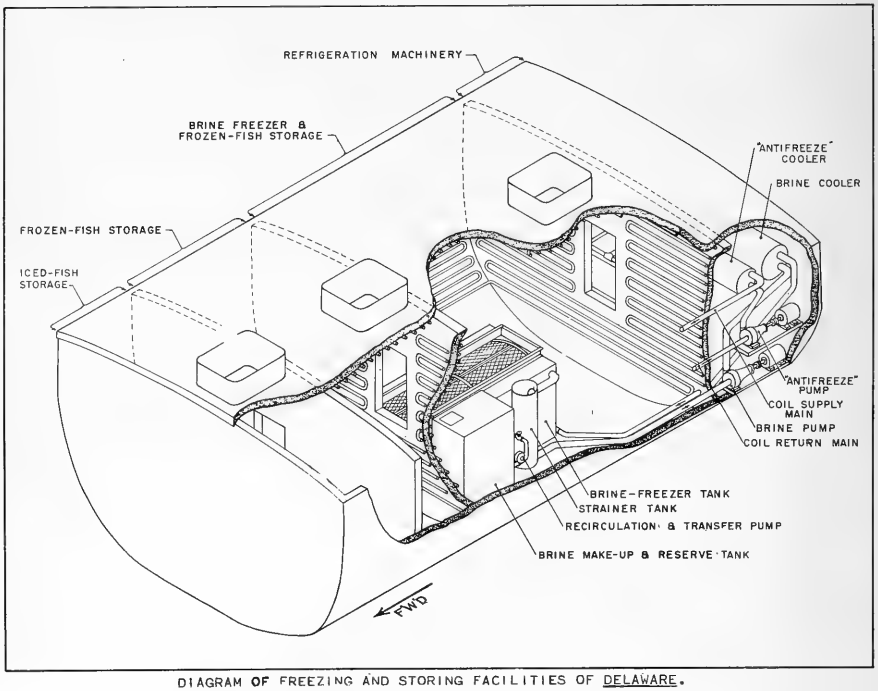

DIAGRAM OF FREEZING AND STORING FACILITIES OF DELAWARE.

tions insulated and refrigerated for storing round frozen fish and for housing the brine-freezing apparatus; and one pen-section aftermost housing the refrigeration machinery.

The new forward frozen-fish storage space is refrigerated by 1,500 feet of $1\frac{1}{4}$-inch iron-pipe coils mounted on deckhead, bulkheads, and skin. Wooden gratings are laid on the floor to aid in the circulation of air under the piles of frozen fish.

The cooling coils of both frozen-fish storage spaces were arranged to provide flexibility of control in maintaining the desired storage temperatures. The refrigerant, an aqueous solution of ethanol referred to herein as "antifreeze," is pumped through the shell-and-tube cooler in the refrigeration machinery room (Butler, et al 1952), circulated through the room cooling coils, then returned to the cooler. A rectangular 40-gallon "antifreeze" supply and surge-tank, located

above deck, is connected by a 3/4-inch line to the 2-inch return main. Four banks of coils, one on each side of the two refrigerated spaces, are supplied with the chilled "antifreeze" through a 2-inch supply main by means of four conveniently located distribution valves. Thus, the refrigeration supplied to either storage space may be regulated.

BRINE MAKE-UP TANK AND ACCESSORIES: A brine make-up tank was constructed to serve as a reservoir for maintaining the optimum brine level in the freezer irrespective of the amount of fish-loaded, and to serve as a make-up tank for preparing brine of the desired concentration to overcome normal dilution of the freezing medium. Two possible sources of dilution of the freezing medium are the gradual addition of sea water associated with the fish, and the slight uptake of salt by the fish during the freezing process.

A rectangular steel tank, 5 feet high by 4 feet long by 2½ feet wide, was welded to the forward port side of the brine freezer to serve as the make-up and reserve. The top is enclosed except for a small opening for charging the tank with salt. The tank is fitted with an outlet and two nozzle inlets interconnected through a 1/4-hp. rotary pump to the freezer tank and to an overboard discharge. Valves are so arranged that the make-up solution can be recirculated in the make-up tank via the nozzle inlets to promote dissolving of the salt; the solution can be pumped from make-up tank to freezer (and vice versa), or it can be pumped overboard from either tank.

RELOCATION OF PUMPS: The brine and "antifreeze" circulating pumps, originally located adjacent to the freezer tank (see illustration in Part 3 of this series by Butler, et al 1952) have been relocated on the port side of the refrigeration machinery room. This change was made to provide more space and to reduce the refrigeration load in the cold-storage area, and to afford better access to the pumps for maintenance. At the same time, the original ½-hp. "antifreeze" circulating pump was replaced by a 1½-hp. pump to give adequate circulation through the enlarged cooling-coil system. To obviate the necessity of insulating the individual brine and "antifreeze" pipes and fittings, a cork-insulated partition, fitted with a small access door, was constructed to separate the area where the pumps and piping are located from the warm refrigeration machinery room.

REFRIGERATION PLANT: Additional controls and measuring instruments were installed and some modifications made to the absorption refrigeration machinery. While it is recognized that simplicity and ruggedness are major requirements for successful operation aboard a fishing vessel, the experimental nature of this installation enhances the need for accurate measurement and control.

To provide greater flexibility of operation, the system by which liquid ammonia was supplied to the shell-and-tube brine and "antifreeze" coolers has been modified. Formerly the supply to both coolers was controlled by a single low-pressure float control which, by means of equalizing lines joining the coolers, maintained the ammonia liquid level in both coolers simultaneously. The equalizing lines were removed and in their place was installed a separate thermostatic liquid feed control for the "antifreeze" cooler. Now either cooler can be operated whether or not the other is in use.

To guard against the possibility of freezing the brine in the tubes of the brine cooler when the brine temperature is near its freezing point and no fish are being frozen, an automatic evaporator pressure regulator was installed in the ammonia vapor line leading from the top of the cooler to the absorber. This control is actuated by the temperature of the brine leaving the cooler. When the brine is cooled to a predetermined temperature, the valve closes and stops the cooling process until the brine temperature rises again.

The level of aqua-ammonia in the generator of the absorption refrigeration machine (Butler, et al 1952) is indirectly affected by the rate of flow of cooling water through the condenser. To maintain an optimum level under varying refrigeration loads, an automatic flow regulator was therefore installed in the cooling water system.

Two 2-pen recording thermometers were installed in the refrigeration machinery room. One records the air temperature in the forward and the aft frozen-fish storage spaces, while the other records the temperature of the circulating brine before and after it passes through the brine cooler. The latter temperature recorder, used in conjunction with an orifice-plate flowmeter in the brine-circulating system, indicates the refrigeration output of the brine cooler.

While still further improvements in equipment are contemplated, the changes and additions described produced considerable improvement in the performance of the experimental brine-freezing and cold-storage equipment aboard the Delaware.

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TRADE SCHOOL FOR CANNING IN NORWAY

A trade school for the canning industry was opened at Ledal, near Stavanger, Norway, towards the latter part of August 1952, reported The Fishing News, a British fishery periodical. It is claimed to be the only school of its kind in the world and was built at an estimated cost of $US420,000.

Courses at the school last 18 months and are designed to train workers for positions as foremen, supervisors, and production planners. A number of offices and institutions relating to the canning industry moved into the school. Since fish canning is an important part of the Norwegian canning industry, there no doubt will be training in fish canning operations.

Progress on Projects, February 1953

REFRIGERATION: Preparation of a Manual on the Refrigeration of Fish: In order to provide certain information to include in the manual, a survey was made of refrigerated retail display cases in approximately 100 supermarkets from Washington, D. C., to Boston, Massachusetts. The following observations were made: (1) availability of frozen fishery products was generally adequate; (2) sales effort towards marketing frozen fish was quite variable; (3) holding temperatures in frozen-food cabinets were generally higher than they should be to protect the quality of the frozen fish. Work on the manual had been delayed due to the illness and subsequent death of the technologist assigned to the project. Another technologist has been transferred from the Boston Technological laboratory to College Park to continue the work. (College Park)

* * * * *

Freezing Fish at Sea, Defrosting, Filleting, and Refreezing the Fillets: Vessel Operation: VESSEL: Specifications for bids were prepared for the annual overhauling of and for certain alterations on the research trawler Delaware. Alterations on the Delaware will include the installation of a new ventilating system in the freezing-machinery room and the installation of a new basket-type brine freezer. The new brine freezer has been designed so that loading and unloading operations can be carried out on deck. The new arrangement will also allow fuller use of available frozen storage space. The capacity of the brine freezer has been increased so as to permit continuous freezing of fish during normal fishing operations.

LABORATORY: To obtain further information on salt penetration into fish, two samples of round scrod haddock were immersed in cold (5° F.) sodium-chloride brine (25 percent) for 7 days. Weight losses in the two samples during the immersion period were 5.3 percent and 6.4 percent. The fish were extremely desiccated, the surfaces were soft and rubbery, and the tail sections were flexible. The surface areas and tail sections apparently were not frozen even at 5° F. due to the penetration of salt from the cold brine into the meat of the fish. Cross-section cuts of the fish revealed that the center area was frozen, but the outer area--3/16-inch from the surface--was unfrozen. This unfrozen area was highly discolored. The samples were inedible due to saltiness and off-flavors. Further tests will be made to determine the maximum time scrod haddock can be held in cold brine before excessive salt penetration occurs. Present recommended practices of removing the fish from the brine immediately after they are frozen result in negligible penetration of salt. (Boston)

* * * * *

BYPRODUCTS: Vitamin Content and Nutritive Value of Fishery Byproducts: Analyses were made of samples of anchovy, sardine, and mackerel scrap, and whale-loin meal for riboflavin, niacin, and vitamin B_{12} content. The results are as follows:

Sample	Sample Number	Method of Drying	Moisture	Oil	Vitamin Content Moisture-and-Oil-Free Basis		
					Riboflavin	Niacin	Vitamin B_{12}
			Percent	Percent	... Micrograms Per Gram ...		
Anchovy scrap	1	Steam-tube dryer	9.90	8.86	-	-	0.24
	2		3.06	7.61	4.7	41	0.14
Sardine scrap	1	Steam-tube dryer	3.46	6.67	5.6	65	0.26
Mackerel scrap	1	Steam-tube dryer	9.71	7.32	5.5	62	0.40
	2		9.03	6.65	5.6	62	0.41
	3		10.38	6.90	6.8	71	0.49
Whale-loin meal	1	Air dryer (at 160° F. for 10 to 12 hours)	7.26	15.97	10.9	117	0.081
	2		8.82	15.73	10.6	124	0.078

Development of a Dried Product from Condensed Menhaden Solubles or Stickwater: After a delay by the manufacturer, the experimental drum dryer was received at the College Park Technological Laboratory. During the month the equipment was installed and certain preliminary experiments were carried out.

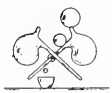
* * * * *

ANALYSIS AND COMPOSITION: Composition and Cold-Storage Life of Fresh-water Fish: The proximate composition of six additional individual samples of lake trout was determined. The fish were caught in June 1952 in Lake Superior.

Composition of Edible Portion of Lake Trout (Cristivomer namaycush)

Sample Number	Length	Weight of Eviscerated Fish	Fillet Yield from the Eviscerated Fish	Proximate Composition of Edible Portion			
				Moisture	Fat	Protein	Ash
	Centi-meters	Grams	Percent	Percent	Percent	Percent	Percent
7	70	2745	63.7	72.4	11.65	17.4	0.97
8	61	1955	59.3	71.0	12.68	18.3	1.13
9	60	1535	59.1	75.1	6.91	18.6	1.03
10	56	1255	58.0	75.7	5.36	18.8	1.08
11	54	930	55.9	77.6	2.76	19.6	0.94
12	54	960	56.1	80.3	1.93	18.4	0.84

(Seattle)



TECHNICAL NOTE NO. 25--AMINO-ACID CONTENT OF SALMON ROE

ABSTRACT

THE "ESSENTIAL" AMINO-ACID CONTENT OF ROE FROM THE FIVE SPECIES OF SALMON HAVE BEEN DETERMINED. ANALYSES OF EIGHT INDIVIDUAL ROE FROM PINK SALMON OF SIMILAR AND MODERATE MATURITY SHOWED NO STATISTICALLY SIGNIFICANT VARIATION IN AMINO-ACID CONTENT. THERE WAS AN INDICATION THAT THE ESSENTIAL AMINO-ACID CONTENT OF KING SALMON ROE SHOWED AN INCREASING TREND WITH MATURITY. THERE WAS NO APPARENT DIFFERENCE IN THE AMINO-ACID CONTENT OF ROE FROM THE FIVE SPECIES OF SALMON WHICH WERE OF SIMILAR (MODERATE) MATURITY. THE AVERAGE AMINO-ACID CONTENT OF MATURE ROE FROM THE FIVE SPECIES OF SALMON EXPRESSED AS A PERCENTAGE OF PROTEIN WAS: ARGININE 7.3; HISTIDINE 2.6; ISOLEUCINE 7.4; LEUCINE 9.9; LYSINE 8.8; METHIONINE 3.0; PHENYLALANINE 4.8; THREONINE 5.7; TRYPTOPHANE 0.9; AND VALINE 7.2.

INTRODUCTION

Studies on the utilization of Alaska salmon-cannery waste have indicated that salmon eggs offer considerable promise for the development of valuable industrial products (Jones, Carrigan, and Dassow 1948), besides serving as an excellent source of feed for hatchery fish (Robinson, Palmer, and Burrows 1949). Little is known, however, about the composition of the protein of salmon roe. Since most of the present uses for salmon eggs depend on their high protein content, 23 to 29 percent (Jones, Carrigan, and Dassow 1948), a study of the amino-acid content of this material was considered desirable.

The amino-acid content of salmon roe was studied by considering possible variation in composition due to species, maturity, and individual variation. Preliminary studies, using the microbiological assay technique, have been limited to determinations of the "essential" amino acids (arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophane, and valine).

EXPERIMENTAL PROCEDURES

Source and Preparation of Samples: The roe from king (Oncorhynchus tschawytscha), chum (O. keta), red (O. nerka), coho (O. kisutch), and pink (O. gorbuscha) salmon, of varying degrees of sexual maturity, were obtained in a random manner from local sources. The skeins were sorted as to relative maturity, sealed in cans, and frozen at -20° F. The frozen samples were stored at 0° F. until needed for analysis.

Crude protein samples were prepared as follows: The eggs were thawed then blended with acetone in an electric blender. The samples were covered with additional acetone and permitted to stand overnight. They were then subjected to continuous Soxhlet extraction with acetone for 20 hours. The residue was dried in a vacuum oven (29 inches of mercury vacuum) at 40° C. for one hour, and finely ground. The dry and fat-free samples were stored in airtight containers.

The degree of development or maturity of the salmon eggs was estimated by means of the arbitrary scale suggested by Davidson and Shostrom (1936). The scale consists of arbitrary values ranging from 1 to 4 in relation to the size and condition of the eggs as they are found either in ovaries or loose in the body cavity of the salmon. Eggs that were found to be small and compact in the ovaries were given a classification of 1. Those that were greatly increased in size and had been shed from the ovaries into the body cavity were given a classification of 4. Those found in intermediate stages of development were graded 2 or 3.

Assay Method: The microbiological procedure and media of Henderson and Snell (1948) were used. This method employs various lactic acid-producing bacteria with a single uniform medium. Acid production was measured by electrometric titration. Streptococcus faecalis R (American Type Culture Collection #8043) was the assay organism used for arginine, leucine, methionine, threonine, and valine; Leuconostoc mesenteroides (A.T.C.C. #8042) was used for histidine, isoleucine, lysine, and phenylalanine; and Lactobacillus plantarum (A.T.C.C. #8014) was used for tryptophane. Protein-acid hydrolysates were prepared by autoclaving 0.5 gm. of the dried protein in sealed pyrex tubes with 20 ml. of 3 N hydrochloric acid for 5 hours at 15 pounds pressure. Alkaline hydrolysates for tryptophane assays were prepared by autoclaving 0.5 gm. of the dried protein with 10 ml. of 5 N sodium hydroxide for 10 hours at 15 pounds pressure in covered, stainless steel beakers. Complete racemization of the tryptophane was assumed. The alkaline hydrolysates were acidified with excess acetic acid and extracted twice with equal volumes of ethyl ether (Neilands, Sirny, Sohljell, Strong, and Elvehjem 1949). Nitrogen determinations were carried out on triplicate aliquots of the protein-acid hydrolysates by the micro Kjeldahl method of Ma and Zuazaga (1942).

RESULTS

The first phase was a determination of the variability of the amino-acid content of egg samples from salmon of identical species and of similar physical characteristics. Eight individual skeins of eggs of moderate maturity (Classification 3) were selected from eight pink salmon and assayed separately. In each case the whole skein was utilized, including the skein membrane and adhering slime layer.

The amino-acid distribution in the eight samples of salmon eggs of similar sexual maturity examined was very similar (table 1), giving no indication of a

Table 1 - Amino-Acid Content of Salmon Egg Protein from Pink Salmon of Similar Sexual Maturity[1]

Sample	Skein Number	Amino-Acid Content (In Grams per 100 Grams of Protein)[2]									
		Argi-nine	Histi-dine	Isoleu-cine	Leucine	Lysine	Methio-nine	Phenyl-alanine	Threo-nine	Trypto-phane	Valine
Pink Salmon Roe	1	7.5	2.8	7.1	9.0	8.9	2.7	4.8	5.4	1.1	7.5
	2	6.8	2.8	7.0	9.0	8.8	2.7	4.7	5.2	1.0	7.9
	3	7.1	2.9	6.8	9.6	9.0	2.9	4.7	5.1	1.2	8.7
	4	7.2	2.8	6.8	9.3	8.8	3.0	4.7	5.1	1.1	8.8
	5	7.3	2.9	6.9	9.6	8.9	3.2	5.1	5.1	1.1	8.0
	6	6.9	2.8	7.1	9.5	9.1	3.3	5.2	5.0	1.1	8.4
	7	7.5	2.9	7.0	9.7	8.8	3.2	4.9	5.1	1.1	7.7
	8	7.6	2.8	6.9	9.7	8.9	3.3	5.0	5.2	1.1	7.9
	Avg.[3]	7.2±0.3	2.8±0.1	7.0±0.2	9.4±0.3	8.9±0.1	3.0±0.3	4.9±0.2	5.2±0.1	1.1±0.1	8.1±0.5

1/ ALL EGGS WERE MODERATELY MATURE AND OF CLASSIFICATION 3 (EGG DIAMETER, 6.0 ± 0.5 MM.).
2/ PROTEIN EQUALS NITROGEN TIMES 6.25.
3/ AVERAGE VALUES ARE GIVEN AS THE MEAN PLUS OR MINUS THE STANDARD DEVIATION.

statistically significant variation. (Recovery experiments, in which amino-acid standards were added to protein hydrolysates, averaged from 96 to 107 percent of the theoretical amount.)

The second phase was a determination of the essential amino-acid content of egg samples from salmon of identical species but of varying sexual maturity. Protein samples were prepared from the eggs of king salmon corresponding to the different arbitrary levels of sexual maturity described previously. For each protein sample, 25-gm. portions were cut vertically from the midsections of 6 individual skeins, combined, and homogenized with acetone. The proportional parts of the roe (egg casings, sac contents, and skein membrane when present) were not considered, since the relative amounts vary with maturity. An effective separation of these components is impossible in some cases and any error thus introduced is probably of small magnitude. A protein hydrolysate was prepared from a representative sample of each homogenate and assayed for the essential amino acids.

In general, there was an indication that for king salmon roe, the essential amino-acid content showed an increasing trend with maturity (table 2). In some

Table 2 - Amino-Acid Content of Salmon Egg Protein from King Salmon of Varying Degrees of Maturity

Sample	Sample Number	Egg Classification[1]	Size of Eggs--Diameter in Millimeters	Amino-Acid Content (In Grams Per 100 Grams of Protein)[2]									
				Arginine	Histidine	Isoleucine	Leucine	Lysine	Methionine	Phenylalanine	Threonine	Tryptophane	Valine
King Salmon Roe	1	1	2.0 ± 0.5	6.5	2.1	5.3	7.0	6.1	2.4	4.3	5.9	0.3	4.9
	2	1	2.0 ± 0.5	7.2	2.4	6.5	8.5	7.7	2.7	5.0	5.8	0.8	6.1
	3	2	4.0 ± 0.5	7.3	2.5	7.2	9.3	8.5	2.7	5.3	5.5	0.8	6.8
	4	3	7.0 ± 0.5	8.0	2.4	7.5	9.4	9.0	3.1	4.9	5.7	0.8	7.0
	5	4	8.0 ± 0.5	7.7	2.4	7.3	9.6	8.9	3.1	4.8	5.7	0.7	7.0
	6	4	8.0 ± 0.5	7.1	2.4	7.2	9.9	8.8	3.0	4.8	5.9	0.9	7.1
"White Spring Salmon Roe"[3]	-	-	-	5.9	1.4	8.2	11.1	1.8	1.9	6.3	4.7	0.7	7.5

1/AN ARBITRARY SCALE INDICATING DEGREE OF SEXUAL MATURITY. CLASS 1 EGGS ARE VERY IMMATURE; CLASS 4 EGGS, VERY MATURE; AND CLASS 2 AND 3 INTERMEDIATE MATURITY (BETWEEN 1 AND 4).
2/PROTEIN EQUALS NITROGEN TIMES 6.25.
3/DATA OF DEAS AND TARR (1949).

cases, the values for immature eggs (Classification 1) were 30 percent lower than the mean for all values of this species.

A comparison of the values obtained for these materials with values reported by Deas and Tarr (1949) for "white spring salmon roe" shows that, with the exception of lysine, the distribution was somewhat similar. The value of 1.8 gm. of lysine per 100 gm. of protein reported for "white spring salmon roe" is unusually low for an animal protein.

For a comparison of the essential amino-acid content of salmon egg samples from the different species, protein samples from moderately mature eggs (Classification 3) from the five species of salmon were analyzed. The results (table 3)

Table 3 - Amino-Acid Content of Salmon Egg Protein from Five Species of Salmon of Similar Sexual Maturity[1]

Sample		Number of Samples Analyzed[3]	Amino-Acid Content (In Grams Per 100 Grams of Protein)[2]									
			Arginine	Histidine	Isoleucine	Leucine	Lysine	Methionine	Phenylalanine	Threonine	Tryptophane	Valine
Salmon Roe	King	1	8.0	2.4	7.5	9.4	9.0	3.1	4.9	5.7	0.8	7.0
	Chum	2	7.2	2.8	7.4	10.2	9.0	3.1	4.8	6.1	0.9	7.2
	Sockeye	2	7.1	2.7	7.6	10.1	8.7	3.0	4.7	5.7	0.8	6.8
	Coho	1	7.3	2.7	8.0	10.2	8.7	3.0	4.9	5.8	0.9	6.8
	Pink	2	7.2	2.8	7.3	9.8	8.9	3.0	4.9	5.6	0.9	7.4
Animal Liver[4]		-	6.5	2.6	5.6	8.4	6.3	3.2	7.3	5.8	1.5	6.2

1/ALL EGGS WERE MODERATELY MATURE AND OF CLASSIFICATION 3. EGG DIAMETERS WERE: KING, 7 MM.; CHUM, 7 MM.; SOCKEYE, 5 MM.; COHO, 6.5 MM.; AND PINK, 5.5 MM. (ALL VALUES TO ±0.5 MM.)
2/PROTEIN EQUALS NITROGEN TIMES 6.25.
3/EACH SAMPLE WAS PREPARED FROM ROE REPRESENTING SIX OR MORE FISH.
4/DATA OF BLOCK AND BOLLING (1945).

indicate no apparent difference in the essential amino-acid content of the eggs obtained from the five species of salmon of moderate and similar maturity.

A detailed evaluation of the data reported in this paper will not be attempted. Corresponding amino-acid values for animal liver, a feed commonly used for hatchery fish, are presented for comparison (table 3). Any conclusions as to the quality of salmon-egg protein (based on amino-acid content) as compared with animal liver, for example, are not warranted, since the amino-acid requirements of hatchery fish have not been established. Further studies on the variability of the amino-acid content of salmon egg protein from the different species of salmon of varying sexual maturity are being carried out, and will be reported in more detail at a later date.

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MAYONNAISE WITH FISH-PROTEIN STABILIZER WITHSTANDS HEAT PROCESSING

By substituting egg yolk with a fish-protein stabilizer (manufactured by a firm in Hamburg, Germany), it is possible to make mayonnaise which withstands heat processes normally used for canned foods. The experiments were made with shrimp packed in mayonnaise. (Report of the Technological Laboratory of the Danish Ministry of Fisheries, 1951.)

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Additions to the Fleet of U. S. Fishing Vessels

DECEMBER 1952 AND ANNUAL TOTALS 1949-52: A total of 29 vessels of 5 net tons and over received their first documents as fishing craft during December 1952--4 less than in December 1951. Louisiana led with 8 vessels, followed by Florida west coast with 6 vessels, and Florida east coast with 4 vessels.

During the 12 months of 1952, a total of 675 vessels were documented for the first time as fishing vessels, compared with 780 vessels in 1951. Of the total vessels documented during 1952, 438 were built in 1952, 64 in 1951, and the remainder (173) in years prior to 1951.

Vessels Obtaining Their First Documents as Fishing Craft, December 1952 and Annual Totals 1949-52

Section	December		Annual Totals			
	1952	1951	1952	1951	1950	1949
	Number	Number	Number	Number	Number	Number
New England	-	1	30	36	36	35
Middle Atlantic	2	-	26	34	45	44
Chesapeake	2	4	65	36	81	87
South Atlantic	5	5	89	118	153	[1/] 369
Gulf	17	12	161	173	167	
Pacific Coast	3	8	203	284	231	327
Great Lakes	-	-	13	25	12	38
Alaska	-	3	88	71	83	96
Hawaii	-	-	-	3	4	5
Unknown	-	-	-	-	-	1
Total	29	33	675	780	812	1,002

1/ DATA FOR SOUTH ATLANTIC AND GULF COMBINED PRIOR TO 1950.
NOTE: VESSELS HAVE BEEN ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORT.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISH PURCHASES BY DEPARTMENT OF THE ARMY, JANUARY 1953: The U.S. Army Quartermaster Corps in January 1953 purchased 1,558,172 pounds of fresh and frozen fishery products for the military feeding of the Army, Navy, Marine Corps, and Air Force (see table). This was an increase of 40.4 percent in quantity and 33.1 percent in value as compared with purchases in December 1952, but a decrease of 32.8 percent in quantity and 22.6 percent in value from January 1952 purchases.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (January 1953 and 1952)

QUANTITY		VALUE	
January		January	
1953	1952	1953	1952
Lbs.	Lbs.	$	$
1,558,172	2,317,411	840,016	1,084,996

An average price of 53.9 cents per pound was paid for fishery products purchased in January 1953, and 46.8 cents in January 1952. This is an increase of 15.2 percent, a good indication that there were purchases of higher-priced fishery products this year.

Metal Cans--Shipments for Fishery Products, 1951-52

Shipments of metal cans for fishery products during the 12 months of 1952 totaled 107,856 short tons of steel as compared with 105,704 short tons of steel during the year 1951, according to a February 18 report issued by the Bureau of the Census.

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS. REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.

Michigan's Great Lakes Catch of Larger Species Declining

Michigan's catch of the larger fresh-water fish species (lake trout and whitefish) in the Great Lakes has been declining in recent years, while the catch of smaller species (smelt, herring, and chubs) has been increasing. The principal reason for this trend is the sea lamprey which has nearly wiped out lake trout populations in all the Great Lakes except Lake Superior. Recent reports indicate the sea lamprey is on the increase in Lake Superior also, states the Michigan Department of Conservation in a recent news bulletin.

The total volume of the catch in the Great Lakes has changed only slightly in recent years, but the value has dropped as the larger and more valuable species are being replaced by the smaller and less valuable species. This means reduced income to the fishermen.

New Bottom-Fishing Area Discovered Off California Coast

A new bottom-fishing area has been discovered recently off the California Coast by a research team of commercial fishermen and the California Department of Fish and Game. The new grounds (about 600 square miles 140 to 350 fathoms deep) lie 25 to 30 miles off the coast from Morro Bay and Avila. The potential of this bottom fishery is estimated at $3 million annually, reports the California Department of Fish and Game in a February 11 news release.

Two vessels, the Alamo and Empire II, were used in the three-day survey which produced the find. A State biologist reported "mature and heavy Dover soles were found in quantity and plenty of rockfish were taken, indicating that summer trawling might be as rewarding as that off Eureka."

The research cruise was completed early in February. The two boats used special deep-trawling gear and tested Santa Lucia Bank and its shoreside trough. Objectives were to check potential fishery resources and determine if commercial trawling grounds existed in these deep waters.

The commercial captains, both Eureka fishermen, volunteered their vessels for the research cruise, and the Department's Marine Fisheries Branch assigned a biologist and supplied nets for the experimental deep-water drags.

North Pacific Exploratory Fishery Program

"JOHN N. COBB" TO EXPLORE COMMERCIAL SHELLFISH RESOURCES IN SOUTHEASTERN ALASKA (Cruise No. 15): The commercial possibilities of shellfish resources in Southeastern Alaska again will be explored by the Service's exploratory fishing vessel John N. Cobb on a cruise that began at Seattle, Wash., on March 2. Particular emphasis will be placed on finding areas containing shrimp in commercial quantities. This will be the fifth in a series of similar exploratory cruises.

The vessel will commence explorations in Yakutat Bay, fishing both inside and ocean waters in the region, and then will fish certain bays in the Cross Sound area, and off the west coast of Chichagof Island, particularly in the Khaz Bay area. Beam trawls and shrimp traps will be used. Bottom characteristics will be determined by use of a recording depth-finder, and water temperatures and bottom samples will be obtained at each fishing station.

Pacific Oceanic Fishery Investigations

"CHARLES H. GILBERT" FINDS MANY SMALL SCHOOLS OF TUNA WEST OF HAWAII (Cruise No. 7): A surprisingly large number of small schools of skipjack and yellowfin tuna were found in the area west of Hawaii and Lanai Islands as far as 150 miles offshore by the Service's Pacific Oceanic Fishery Investigations research vessel Charles H. Gilbert on a cruise completed on February 14. This was the third tuna-survey by this vessel for signs of skipjack schools in waters north and south of the Hawaiian Islands to a distance of 150 miles.

Preliminary tests on the use of chemical fish attractants in place of live bait were also carried out. It is planned to further explore the use of the tuna attractant developed at Coconut Island by Dr. Albert Tester of the University of Hawaii. If the fish extract can be successfully applied at sea to take the place of live bait in "chumming" for skipjack, it will have wide application here and off the west coast of the United States as well. Several tuna were captured alive and put in the ponds at the University of Hawaii Marine Laboratory at Coconut Island for further testing with the chemical attractant.

In addition, a wide variety of biological specimens were obtained including the uncommon snake mackerel made famous in the accounts of Kon Tiki expedition. Several bands of humpback whales were observed off Molokai and the Kona coast of Hawaii.

These survey cruises will continue intermittently during the winter and increase later in the spring when the skipjack normally appear in abundance around the Is-

lands. These surveys carried out as part of a joint program with the Territory Fish and Game Division are designed to study the possibility for an expansion of the tuna fisheries around the Hawaiian Islands. The scientists of both departments are determined to discover where the skipjack go in the winter and whether or not the fishery can be extended over a larger portion of the year than at the present time.

* * * * *

"HUGH M. SMITH" (Cruise No. 19) AND SAMPAN "TRADEWIND" FISH TUNA IN LINE ISLANDS AREA: A one-month commercial tuna-fishing trip to the Line Islands area was completed February 12 by the Hawaiian sampan Tradewind and the Service's Pacific Oceanic Fishery Investigations research vessel Hugh M. Smith. Both vessels caught 22 tons of yellowfin tuna and 2 tons of market fish.

The Tradewind fished for tuna with live bait. Its Captain reports that bait (mostly mullet, Mugil longimanus) of suitable size for yellowfin fishing was scarce at Palmyra Island, but easily obtained at Christmas and Fanning islands. Surface schools of yellowfin tuna were small and scattered; no large concentrations were encountered, although more schools were observed in the Palmyra area than at the other islands. About half of the 14 tons of yellowfin tuna was caught off Palmyra Island and half off Fanning Island. The two tons of market fish, mostly papio (Caranx sp.), were taken at Christmas Island.

The Hugh M. Smith on this cruise carried out a program of experimental long-line fishing, surveyed the oceanic conditions surrounding the islands, and incidentally supplied fuel and ice to the Tradewind. While the live-bait fishing of the sampan was not outstanding, the experimental long-line fishing by the Hugh M. Smith showed yellowfin tuna catches as high as 14 and 19 fish per hundred hooks. This indicated a high abundance of subsurface yellowfin tuna in the waters close to the islands. The total catch of 8 tons of yellowfin tuna (including shark-eaten fish) by the Hugh M. Smith were delivered to Kauai for canning. The main purpose of the research vessel's cruise was to learn something about the distribution of tuna about the islands instead of trying to catch the maximum amount of fish.

Pennsylvania's Commercial Fish Catch in Lake Erie, 1952

The total catch of fish in Lake Erie by Pennsylvania commercial fish companies in 1952 totaled 2,211,835 pounds (see table), with an ex-vessel value of

Pennsylvania's Commercial Fish Catch in Lake Erie, 1952

Species	Quantity	Value
	Lbs.	$
Blue pike	1,142,297	203,153
Yellow perch	108,268	22,150
Whitefish	808,414	398,061
Cisco or lake herring	31,020	12,928
Yellow pike (pike perch)	21,042	5,603
Catfish	2,322	440
Carp	598	12
Sturgeon	405	346
Burbot	26,964	539
Mullets	10,864	371
Sheepshead or gray bass	9,340	264
White bass	49,801	8,408
Smelt	500	10
Total	2,211,835	652,285

$652,285, according to a recent bulletin from the Pennsylvania Fish Commission. Gill nets accounted for 90 percent of the volume (1,995,657 pounds) and 94 percent of the total value ($612,726). Trap nets caught 6 percent of the total catch (140,800 pounds) and 4 percent of the value ($23,190), while pound nets accounted for the remaining 3 percent of the catch (75,378 pounds) and 2 percent of the value ($16,369).

Shrimp Production for South Atlantic and Gulf States, 1952

Estimated shrimp production in the South Atlantic and Gulf States during 1952 amounted to about 199,400,000 pounds (table 1). September and October were the months of heaviest production, while March and April were the lowest months. Louisiana was the leading producer of shrimp, followed by Texas and Florida.

Table 1 - Shrimp (Heads on) Production for South Atlantic and Gulf States (By Months and States), 1952 1/

Month	North Carolina 2/	South Carolina	Georgia 3/	Florida	Alabama	Mississippi & Louisiana	Texas
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
January	-	10,000	-	3,858,559	118,440	4,671,300	5,267,843
February	-	13,520	-	3,028,640	158,340	7,809,648	5,452,610
March	-	20,160	-	3,439,554	213,780	3,276,840	2,558,014
April	-	16,632	50,400	1,599,718	245,070	3,537,786	2,975,109
May	-	123,144	188,496	2,579,097	112,350	7,943,807	3,959,412
June	-	405,552	336,000	2,750,586	505,260	8,160,075	3,514,438
July	-	456,288	487,200	2,478,700	1,213,632	7,778,001	4,237,840
August	-	514,920	204,960	2,850,512	1,396,382	8,836,317	5,622,041
September	-	1,016,064	453,600	2,735,112	1,125,519	10,318,623	9,144,546
October	-	905,520	394,800	1,796,474	1,237,152	11,794,440	8,230,454
November	-	291,480	189,840	3,656,312	4/600,000	4/7,300,000	4,030,570
December	-	5/139,900	62,160	5/2,100,000	4/200,000	4/6,500,000	4,299,554
State Totals	4/5,920,000	3,913,180	2,367,456	32,873,264	7,125,925	87,926,738	59,292,431

1/PRELIMINARY.
2/DATA NOT AVAILABLE BY MONTHS.
3/BASED ON SALES OF PREPAID TAX STAMPS INSTEAD OF ACTUAL LANDINGS.
4/BASED ON AN ESTIMATE DERIVED FROM FISHERY MARKET NEWS SERVICE RECORDS OF DAILY LANDINGS.
5/ESTIMATED.
NOTE: AS REPORTED BY RESPECTIVE STATE AGENCIES. ORIGINAL DATA IN BARRELS; CONVERTED TO HEADS-ON SHRIMP ON BASIS OF 210 POUNDS PER BARREL (EQUIVALENT TO 125 POUNDS HEADS-OFF SHRIMP). TO CONVERT HEADS-ON DATA TO HEADLESS SHRIMP, MULTIPLY BY .595.

Table 2 - Shrimp (Heads on) Production for South Atlantic & Gulf States, 1950-52

State	1952 1/	1951 1/	1950
	Lbs.	Lbs.	Lbs.
North Carolina	2/5,920,000	6,902,400	8,311,300
South Carolina	2/3,913,180	1,729,793	7,746,400
Georgia	4/2,367,456	3,596,880	11,156,700
Florida	32,873,264	33,319,598	22,906,100
Alabama	2/7,125,925	5,641,924	5,006,500
Mississippi	2/87,926,837	93,172,000	9,460,300
Louisiana			77,835,100
Texas	59,292,431	60,637,746	45,812,000
Total	199,419,093	205,000,341	188,234,300

1/ PRELIMINARY.
2/ BASED ON AN ESTIMATE FROM FISHERY MARKET NEWS SERVICE RECORDS OF DAILY LANDINGS.
3/ DECEMBER LANDINGS ESTIMATED FROM FISHERY MARKET NEWS SERVICE RECORDS OF DAILY LANDINGS.
4/ BASED ON SALES OF PREPAID TAX STAMPS.
NOTE: AS REPORTED BY RESPECTIVE STATE AGENCIES. ORIGINAL DATA IN BARRELS; CONVERTED TO HEADS-ON SHRIMP ON BASIS OF 210 POUNDS PER BARREL (EQUIVALENT TO 125 POUNDS HEADS-OFF SHRIMP). TO CONVERT HEADS-ON DATA TO HEADLESS SHRIMP, MULTIPLY BY .595.

When compared with the record-production year of 1951, shrimp production in 1952 dropped almost 3 percent, attributed mainly to a decline in Louisiana landings (table 2). But shrimp production in 1952 was almost 6 percent greater than in 1950.

Shrimp Vessel Operators Advised by Texas Banks of Possible Loan Action

Certain banks in Texas, holding mortgages or notes against shrimp vessels, have advised vessel owners that their loans or notes will be declared in default if the vessels are seized by Mexican authorities within 10 miles of the Mexican coast, except in case of emergency. This information was received by the Service's New Orleans Market News Service office. The following is an excerpt from the notification forwarded to owners of shrimp vessels who have loans from these Texas banks:

"You are hereby advised that you or your crew members are forbidden to take this boat, which is mortgaged to our bank, closer than ten (10) miles to any part of the Mexican coast at any time (except in case of emergency for repairs or due to bad weather). Should you or any of your crew members violate this stipulation and take the boat in closer to the Mexican shore than this ten-(10) mile limit, our bank shall then declare our note in default and shall demand from you payment in full of your note to us."

Wholesale and Retail Prices

WHOLESALE PRICES, JANUARY 1953: A seasonal decline in production was responsible for increases in the wholesale prices for edible fishery products from December 1952 to January 1953. But compared to the previous year, prices were somewhat lower. The edible fish and shellfish (fresh, frozen, and canned) wholesale index for January 1953 was 110.5 percent of the 1947-49 average (see table)--5.6 percent higher than in December 1952, but 3.5 percent below January 1952, the Bureau of Labor Statistics of the Department of Labor reports.

UNLOADING FISH AT THE FULTON MARKET, CHICAGO, ILL.

For the drawn, dressed, or whole finfish subgroup items, average wholesale prices in January increased 8.2 percent over the previous month, but were 13.9 percent under a year earlier. Western halibut at New York City was the only item under this subgroup which dropped in price from December to January. Whitefish at Chicago jumped 71.7 percent as supplies became short, and the ex-vessel price for large offshore haddock at Boston rose 16.2 percent.

Fresh processed fish and shellfish prices were 7.5 percent higher than in December and 11.9 percent higher than in January 1952. Fresh haddock fillet prices

were up 42.5 percent over December, but were 15.4 percent below January 1952. Fresh shrimp prices increased 10.7 percent from December to January and were 50.5 percent higher than a year ago. Shorter supplies and an exceptionally good demand have kept shrimp prices at a very high level for the past number of months. Shucked oysters declined slightly in line with the usual seasonal trend.

Table 1 - Wholesale Average Prices and Revised Indexes for Edible Fish and Shellfish, January 1953 and Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ($)		Indexes (1947-49 = 100)			
			Jan. 1953 1/	Dec. 1952	Jan. 1953	Dec. 1952	Nov. 1952	Jan. 1952
ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)					110.5	104.6	113.2	114.5
Fresh and Frozen Fishery Products:					119.3	2/111.3	125.8	125.1
Drawn, Dressed, or Whole Finfish:					117.5	2/108.6	138.6	136.4
Haddock, large, offshore, drawn, fresh	Boston	lb.	.13	.11	131.7	113.3	177.0	174.7
Halibut, Western, 20/80 lbs., dressed, fresh or frozen	N.Y.C.	"	.33	.34	103.2	104.5	137.0	102.2
Salmon, king, lge. & med., dressed, fresh or frozen	"	"	.49	.49	110.7	2/109.5	109.7	120.9
Whitefish, mostly Lake Superior, drawn (dressed), fresh	Chicago	"	.58	.34	142.5	83.0	109.1	156.2
Whitefish, mostly Lake Erie pound or gill net, round, fresh	N.Y.C.	"	.49	.48	99.1	96.1	94.0	88.0
Lake trout, domestic, mostly No. 1, drawn (dressed), fresh	Chicago	"	.61	.61	124.0	124.0	120.9	129.1
Yellow pike, mostly Michigan (Lakes Michigan & Huron), round, fresh	N.Y.C.	"	.41	.39	96.1	91.4	96.1	99.7
Processed, Fresh (Fish and Shellfish):					125.2	116.5	113.8	111.9
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.39	.27	131.0	91.9	129.3	154.9
Shrimp, lge. (26-30 count), headless, fresh or frozen	N.Y.C.	"	.78	.70	122.5	110.7	96.4	81.4
Oysters, shucked, standards	Norfolk area	gal.	5.13	5.25	126.8	129.9	129.9	136.1
Processed, Frozen (Fish and Shellfish):					113.6	110.9	102.8	110.5
Fillets: Flounder (yellowtail), skinless, 10-lb. pkg.	Boston	lb.	.34	.34	119.2	119.2	119.2	143.7
Haddock, sml., skins on, 10-lb. cello-pack	"	"	.25	.27	92.0	98.5	93.9	122.7
Ocean perch, skins on, 10-lb. cello-pack	Gloucester	"	.24	.24	114.4	114.4	114.4	125.2
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	"	.79	.73	121.1	111.8	94.9	84.8
Canned Fishery Products:					97.6	94.6	94.7	98.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans per case	Seattle	case	19.71	2/18.71	104.4	99.1	99.1	109.6
Tuna, light meat, solid pack, No. ½ tuna (7 oz.), 48 cans per case	Los Angeles	"	14.50	14.50	90.5	90.5	90.5	81.2
Sardines (pilchards), Calif., tomato pack, No. 1 oval (15 oz.), 48 cans per case	"	"	9.15	9.25	106.8	108.0	109.4	102.2
Sardines, Maine, keyless oil, No. ¼ drawn (3¼ oz.), 100 cans per case	N.Y.C.	"	7.45	7.20	79.3	76.6	76.6	102.7

1/REPRESENT AVERAGE PRICES FOR ONE DAY (MONDAY OR TUESDAY, IF AVAILABLE) DURING WEEK BEGINNING JANUARY 12.
2/REVISED.

Higher frozen shrimp prices (8.3 percent over December) were entirely responsible for the 2.4 percent increase in the processed frozen fish and shellfish prices from December to January and for the fact that the average prices for this subgroup were 2.8 percent higher than a year earlier. Frozen haddock fillets dropped 6.6 percent in January, while fillets of flounder and ocean perch remained unchanged. Heavy stocks of frozen groundfish fillets adversely affected the market for frozen haddock fillets. On the other hand, unusually low inventories have kept frozen shrimp prices at very high levels during recent months. January prices for all frozen fillets were substantially lower than a year ago.

Canned fishery products average prices rose 3.2 percent from December to January. The largest increase was for Maine sardines--13.5 percent. Pink salmon, the only other canned item to increase, rose 5.3 percent. Canned tuna sold at December prices, while California sardines sold 1.1 percent lower. January 1953 canned fish prices were 1.3 percent lower than in the same month in 1952 due mainly to substantially lower quotations for Maine sardines and slightly lower prices for canned pink salmon.

FOREIGN

International

NORTHWEST ATLANTIC FISHERIES COMMISSION

FRANCE LAST OF SIGNATORIES TO RATIFY CONVENTION: The Government of France on January 27, 1953, deposited its instrument of ratification of the Northwest Atlantic Fisheries Convention. France is the tenth and last signatory to the Convention to deposit its instrument of ratification and thus become an active participant in the work of the Commission. The other nine countries are: Canada, Denmark, Norway, Spain, Italy, Portugal, Iceland, United Kingdom, and the United States.

ECUADOR-PERU-CHILE FISHERIES CONFERENCE PLANNED

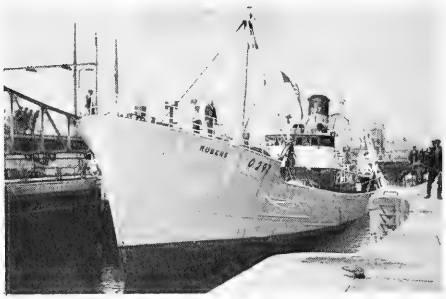
The Ecuadoran Government extended invitations to the Goverrments of Chile and Peru to participate in a fisheries conference in Quito some time in April, according to press reports. These three Governments are the members of the Permanent Commission for the Conservation and Development of Fishing Resources of the South Pacific, which was established pursuant to a resolution approved in the fisheries conference held at Santiago, Chile, in August 1952.

The agenda of the meeting in Quito will be prepared by the Ecuadoran Government, the U. S. Embassy at Quito reports in a February 6 dispatch.

NOTE: ALSO SEE P. 72 OF THIS ISSUE AND COMMERCIAL FISHERIES REVIEW, VOL. 14, NO. 10 (OCTOBER 1952), PP. 54-5.

Belgium

FISHING FLEET, 1951: The Belgian fishing fleet as of December 31, 1951, totaled 427 craft with a gross tonnage of 25,985 tons, a decrease of 17 vessels but an increase of 263 gross tons when compared with 1950 (see table). During 1951, 14 craft (including 11 new ones) were added to the fleet, while 31 were removed, according to a report of the Belgian Administration de la Marine (Service de la Peche Maritime) published in the December 1952 World Fishing, a British trade magazine.



BELGIAN TRAWLER READY TO LEAVE FOR THE FISHING GROUNDS.

There has been a gradual decline in the total number of Belgian fishing vessels since 1938. The largest decrease has been in the smaller Class I vessels, an indication that coastal (inshore) fishing is becoming increas-

ingly less profitable. The number of vessels in this class has decreased 30½ percent since 1938, and only one vessel of this class was added to the fleet in 1951.

Belgian Fishing Fleet as of December 31, 1951

Type of Vessel	No. of Vessels	Total Gross Tonnage	Average Age
Class I - Motor Crevettiers, less than 80 hp.	164	2,798	17 yrs. 17 mos.
Class II - Coastal Motor Trawlers, 80-119 hp.	72	2,363	14 yrs. 3 mos.
Class III - Middle-Water Motor Trawlers, 120-239 hp.	122	8,577	16 yrs.
Class IV - Motor Trawlers, 240-349 hp.	50	6,048	13 yrs. 8 mos.
Class V - Motor Trawlers, 350-500 hp.	10	1,800	9 yrs. 8 mos.
Class VI - Motor Trawlers, Over 500 hp.	2	784	25 yrs.
Class VI - Steam Trawlers, Over 480 hp.	7	3,615	6 yrs. 5 mos.
Total 1951	427	25,985	
1950	444	25,722	
1949	461	30,028	
1946	479	22,533	
1938	510	28,037	

Of the 427 fishing vessels available at the end of 1951, 389 were manned with 1,862 men. Of this total, 1,457 were seamen (fishermen) and 405 were engineers or other specialists. This is an increase of 20 seamen and 2 specialists over 1950. The number of boy entrants (apprentices) is far lower than what the fleet could absorb, and might possibly lead to a lack of replacement for older fishermen. According to a 1931 law, each fishing vessel with a crew of 3 to 8 adults must have 1 boy in service, while each vessel with a crew of more than 8 adults must carry 2 boys. Thus, on December 31, 1951, the fleet should have had a total of 387 boys whereas it only had 138, a 64 percent deficit.

The port of Ostende had the largest fishing fleet in 1951—a total of 205 vessels, including all 9 class VI trawlers and 9 of the 10 class V trawlers. Zeebrugge was next in importance with 156 vessels, followed by Nieuport with 58 vessels, and Blankenberge with 8 vessels.

Canada

FISH FROZEN AT SEA TESTED FOR TASTE: Freezing-fish-at-sea experiments, mainly to determine the comparative taste appeal of certain British Columbia species under various conditions of storage, have been carried out by the Pacific Experimental Station of the Canadian Department of Fisheries at Vancouver, B. C. A tasting panel of 200 Vancouver citizens helped to evaluate the results of the investigations. They compared fish which had been (1) packed only in crushed ice for different periods up to 12 days after catch, (2) frozen within a few hours after being caught and then stored frozen for varying periods, and (3) held in ice up to eight days before freezing and storage. Various other holding and freezing conditions were also compared, reports the December 1952 Trade News, issued by the Department of Fisheries.

Advances in commercial freezing and cold-storage techniques now make it quite practical to maintain high quality in frozen fish, providing that the quality of the fish is excellent when freezing takes place. During the past year tests were continued on fish landed from the Tauranga, a commercial trawler operating out of Vancouver, equipped with mechanical refrigeration facilities made available by the Canadian Fisheries Research Board.

Taste Preference	Test 1	Test 2	Test 3
	Fish Held at -15° F.		
	1 Week	3 Mos.	4 Mos.
	%	%	%
Halibut, frozen at sea and stored frozen.....	31.8	30.4	31.4
Halibut, frozen and stored on shore from fish iced at sea.....	41.6	41.3	42.6
No preference.....	26.6	28.0	26.0
	100.0	100.0	100.0

Observations made in the latest series of tests dealt with halibut and other flat fish, specifically brill and rock sole. The Tauranga's catches were of very high quality, due in part to the refrigerating equipment aboard but also to the short runs to the fishing grounds; the Tauranga landed its fish on the average of 3 to 5 days after catch. Much of that marketed as fresh was delivered to the consumer market 7 to 10 days after catch. Unfrozen fish on the Tauranga was packed in refrigerated ice and stored at temperatures in the refrigerated hold slightly above the freezing point of fresh fish, which is about 30° F.

Halibut Tests: In three recent tests halibut was sometimes frozen on board and sometimes only packed in refrigerated ice aboard for later freezing ashore. Both kinds were held frozen for varying periods at the Station. About 42 percent of the members of the tasting panel expressed a preference for the halibut landed in ice and later frozen and stored; about 31 percent preferred the halibut frozen at sea and kept frozen ashore; and about 27 percent had no preference (see table). The percentages of preference and no preference were remarkably consistent in the three similar tests.

In earlier tests it was shown that when iced halibut was held on ice at 32° F. for storage periods of up to 18 days, preference for frozen halibut increased sharply. This indicated that most of the tasters preferred halibut frozen at sea. The halibut frozen at sea appears to be firmer in texture and to have less moisture than the fish which has been on ice.

Flat-Fish Tests: For flat fish, such as brill and rock sole, 45 percent of the tasters preferred the frozen-at-sea; 35 percent preferred those fish iced at sea and frozen later; the remainder had no preference. The tasters showed a preference for flat fish dressed before storage on board to flat fish dressed after landing, though differences were not great. For example, in one test 37.2 percent preferred dressed-at-sea; 28.1 percent dressed-after-landing; 34.7 percent detected no difference. The usual commercial procedure is to rinse the ungutted flat fish with sea water, then pack whole on ice and store in the hold until landing.

Tuna Tests: Common practice aboard the tuna vessels is to chill the fish and freeze it without dressing, etc. On an albacore tuna fishing trip, fishermen aboard the Tauranga removed the gills and viscera immediately after catching; the fish were then chilled, packed in refrigerated ice, and frozen by contact with the aluminum walls of the refrigerating jacket. Upon landing, the tuna was stored in the frozen state until processed.

Tuna is most familiar to consumers as a canned product. For this reason it was desirable to offer the panel tasters a product already processed. By way of

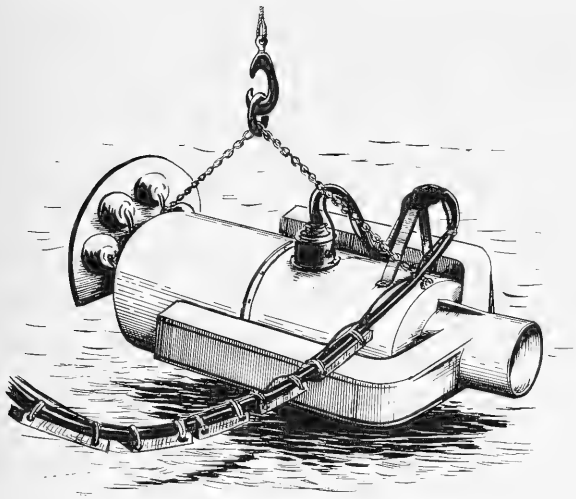
comparison a can of good quality, unlabelled, commercially-canned albacore tuna was sent to the tasters with a can of tuna from the Tauranga catch. The "commercial" tuna was caught in the same general area as the Tauranga tuna; both boats are refrigerated, the times of catch were within the same fortnight, and both packs were canned locally. The only difference in treatment was that the Tauranga tuna were dressed before chilling and freezing whereas the "commercial" tuna were dressed after landing at Vancouver.

The results to date (from 158 persons participating in the panel of 245 persons) are: 54 percent preferred the Tauranga pack, 33 percent preferred the "commercial" pack, and 13 percent indicated no preference.

Further tests on canned albacore tuna are to be made after varying periods of storage of the raw or unprocessed fish.

* * * * *

UNDERWATER TELEVISION TESTED OFF BRITISH COLUMBIA: The first Canadian underwater television tests in salt water were carried out off British Columbia in the vicinity of Nanaimo on November 4 and 5, 1952, from the Canadian research vessel Investigator I. The tests were made to familiarize the staff of the Pacific Biological Station of the Fisheries Research Board of Canada with the possibilities of the equipment in fisheries research. Previous tests had been made in fresh waters of the Ottawa River and Lake Ontario in 1951, and in Lake Minnewanka in 1952, according to the November 1952 Trade News of the Canadian Department of Fisheries.



SKETCH OF CAMERA BEING LOWERED INTO THE WATER.

The Canadian equipment was devised by W. F. Torrington and his assistants, W. E. M. Dale and T. R. Smith, of the National Research Council of Canada.

The television camera is enclosed in a steel watertight cylinder and weighs about 300 pounds out of water. The cylinder is 3 feet long and 18 inches in diameter. In addition to the camera, it contains 3 electric motors and a 50-pound lead weight which serves partly to offset the buoyancy and partly, by shifting its position forward or backward, to incline the nose of the cylinder up or down. Two propellers fitted to the stern are driven by electric motors and are capable of moving the cylinder forward or backward, or of swinging it from side to side. A battery of four spotlights is mounted on the front of the casing and provides adequate illumination. Weights suspended by a length of chain beneath the unit cause it to sink until the weights touch bottom, whereupon the unit regains its buoyancy and remains at a distance from the bottom, governed by the length of chain.

The images picked up by the sensitive tube in the camera are transmitted to the television screens on the boat through a coaxial cable. In addition there is a one-inch cable, lined with wooden floats to help buoy it up and reduce drag on the cylinder to a minimum. This cable contains all the conductors providing power for the camera, lights, and propulsion motors. The present cable is about 600 feet long and weighs about 400 pounds.

All operations of the camera are governed by remote control. Movements of the camera are directed from a small unit. The master control unit regulates the quality of the image on the screen and the other electronic functions, yet also enables the operator to focus the camera and change the lens openings. The lens can even be changed from the normal 2 inches to 5 inches for close-ups.

There are two viewing units. One provides for continuous underwater observation, while an auxiliary unit is fitted with a special movie camera. This can make a permanent record of objects of interest, without interfering with ordinary observations.

* * * * *

MARINE-OIL PRODUCTION, 1952: Canadian marine-oil production in 1952 is estimated at 19,070 short tons--little more than one-half the 36,240 tons produced in 1951 (see table), reports the February 23 Foreign Crops and Markets, issued by the U. S. Department of Agriculture. Competition from lower-priced vegetable oils and synthetic vitamins, and the reentry of Japanese fish oils into the market, caused Canadian processing firms to reduce fish prices. As a result, many fishermen tied-up and 1952 Canadian landings of sea fish were 10 percent lower than the previous year. Tie-ups particularly hampered British Colombia herring and salmon fisheries.

Canadian Marine-Oil Production, 1952

Variety	1952	1951
	(short tons)	
Cod oil (all types)	4,740	6,010
Herring body and offal oil	6,940	16,340
Salmon offal oil	190	970
Grayfish liver oil	260	340
Seal oil	2,970	4,360
Other marine oil (mostly whale)	3,970	8,220
Total	19,070	36,240

Although cod landings were large off the Maritime Provinces, they were not sufficient to offset the greatly reduced Newfoundland catch. Only one whaling firm operated in Newfoundland last year, whereas in 1951 there were 3. Seal-oil production likewise decreased due to a limited market and low returns to producers.

Denmark

REVIEW OF THE FISHERIES, 1951: Landings and Value: The total catch of fish and shellfish in Denmark in 1951 amounted to approximately 278,300 metric tons, valued at about 177,100,000 kroner (US$25,600,000) to the fishermen (see table), according to Fiskeri-Beretning for the Year 1951, a Danish Government publication. This includes 15,000 metric tons, valued at 7,000,000 kroner (US$1,000,000), landed by Swedish vessels in Danish ports, and it was mostly herring.

The total catch of edible fish and shellfish increased about 1,600 metric tons over 1950, while the catch of fish for reduction increased about 46,000 metric tons

and the mussel catch declined about 8,500 metric tons. About 11,700,000 kroner (US$1,700,000) of the increased value can be attributed to edible fish and shellfish, mainly due to a slight rise in the price of plaice, dab, cod, and mackerel. The remaining 8,200,000 kroner (US$1,200,000) increase mainly derived from the increased catch of waste fish for reduction.

Danish Fishery Products Landings, 1951 and 1950 1/

Species	1951 Quantity	1951 Value		1950 Quantity	1950 Value	
	Metric Tons	1,000 kroner	US$	Metric Tons	1,000 kroner	US$
Common sole	3,103	6,563	948,400	1,704	4,086	590,500
Turbot	1,022	2,070	299,100	1,025	1,739	251,300
Brill	387	635	91,800	320	569	82,200
Plaice	31,744	52,721	7,619,100	31,860	47,778	6,904,300
Lemon sole	1,007	1,606	232,100	589	960	138,700
Witch flounder	473	397	57,400	337	297	42,900
Flounder	5,166	3,910	565,000	5,681	3,925	567,200
Dab (yellowtail)	4,302	3,467	501,000	3,410	2,188	316,200
Haddock	1,483	1,781	257,400	2,390	2,141	309,400
Cod	48,282	23,785	3,437,000	45,308	21,327	3,081,900
Whiting	503	240	34,700	440	146	21,100
Lumpfish	142	128	18,500	165	134	19,400
Garpike	2,470	1,117	161,400	2,295	880	127,200
Common mackerel	9,975	5,639	814,900	10,281	4,750	686,400
Herring	24,486	12,655	1,828,800	26,341	12,153	1,756,200
Sprat	2,875	1,465	211,700	3,855	2,175	314,300
Salmon	1,136	7,986	1,154,000	1,355	8,359	1,207,900
Lobster and shrimp	1,752	6,002	867,300	1,676	6,917	999,600
Mussels	17,267	700	101,200	25,792	1,186	171,400
Miscellaneous for food	12,328	25,851	3,735,800	12,020	25,777	3,725,000
Miscellaneous for reduction	108,391	18,426	2,662,700	62,117	9,711	1,403,300
Total	278,294	177,144	25,598,900	238,961	157,198	22,716,400

1/ INCLUDES CATCH OF BOTH FRESH- AND SALT-WATER FISHERIES.

Fishing Fleet and Fishermen: The total fishing fleet at the end of 1951 consisted (not including 40 craft for the transport of fish) of about 16,065 vessels, of which 7,697 were motor vessels. Of these, 18 were over 50 gross tons, 1,293 between 15 and 50 gross tons, 2,335 between 5 and 15 gross tons, and the remainder below 5 gross tons.

The total value of the fishing vessels was estimated at 143,600,000 kroner (US$20,800,000). The value of fishing gear was about 44,600,000 kroner (US$6,400,000). The value of sheds, for the storing of the fishing gear etc., was estimated at about 3,000,000 kroner (US$433,000) in 1951.

The total number of fishermen regularly or occasionally employed was 19,623 in 1951 as compared with 19,882 in 1950. The number of regular fishermen decreased from 14,260 to 14,078.

Stormy periods during the year caused a number of shipwrecks and loss of human lives. In all, 25 fishermen perished in the course of the year while engaged in fishing, and 20 vessels foundered (4 by explosion of mines).

Catch of Principal Species: The plaice fisheries yielded about the same as in 1950, but the catch showed a considerable increase in the Skagerak, the Kattegat and the Belt Sea, and a corresponding drop in the North Sea.

The total yield in 1951 from the herring fisheries was about 2,000 metric tons less than in 1950. The yield from the herring fisheries in the North Sea was almost double that of 1950, while the Baltic and the Belt Sea showed only a small increase. On the other hand the catch in the Skagerak declined about 4,000 metric tons as compared with 1950; likewise the catch in the Kattegat declined but considerably less than that of the Skagerak.

Cod, the most important edible fish in volume, increased 3,000 metric tons. Fishing was carried on mainly in the Belt Sea and the Baltic, which together yielded almost 50 percent of the total catch of cod.

The 1951 mackerel catch was almost equal to that of 1950. About 85 percent of the mackerel was caught in the Kattegat and Skagerak—60 and 40 percent, respectively.

The drop in the catch of mussels is due to the almost complete suspension of this fishery in the Kattegat and the Belt Sea.

Fishing Areas: The catch from the fiords of Western Jutland, the Lime Fiord, and the more remote waters declined slightly in 1951, while catches in all the other waters increased.

DANISH BEACH LANDING CRAFT. FAO EXPERTS HAVE STUDIED THESE BOATS TO SEE WHETHER THEY COULD BE INTRODUCED IN OTHER COUNTRIES.

About 50 vessels were fishing in the Barents Sea in 1951 as compared with about 100 in 1950. The total yield, which was landed in British ports, amounted to about 500 metric tons valued at about 800,000 kroner (US$116,000) as compared with about 800 metric tons and 900,000 kroner (US$130,000) in 1950. This fishing, therefore, seems to have been fairly profitable to the fishermen in 1951. Plaice totaled 400 metric tons, valued at about 700,000 kroner (US$100,000).

The bulk of the Danish catch in 1951 was caught in Danish waters, but Danish fishermen also exploited remote seas—first and foremost, the waters off Greenland. Five companies operated there, and work has been continued on the basis of the experience gained in recent years. Improved landing facilities have been provided, and technical improvements introduced at the stations ashore. Fishing was mainly

by lines and pound nets. The total yield (converted into whole fish) amounted to about 5,400 metric tons of which about 5,000 metric tons were salted cod.

As in previous years, a large number of cutters with trawl and Danish seine have been operating in waters off Iceland. They disposed of their catch (mainly plaice) in British ports. Further, a few Danish expeditions also took part in the herring fisheries off Northern Iceland. The total catch from this area was about 1,400 metric tons valued at about 1,500,000 kroner (US$218,000), mainly plaice, herring, cod, and haddock.

Fresh-Water Fisheries: Only scant information is available about the fresh-water fish caught in lakes and rivers. The total yield is estimated at about 1,000 metric tons, valued at about 1,000,000 kroner (US$145,000). Fairly complete information has been obtained about the considerable rearing of brook trout, which takes place in the pond cultures at Danish fish farms. Total production for export was about 2,500 metric tons in 1951, valued at about 12,100,000 kroner (US$1,750,000) as compared with 2,100 metric tons and 10,300,000 kroner (US$1,500,000) in 1950. Only a small part of the production was disposed of on the domestic market.

Shellfish: Oyster dredging, state operated and carried on in the Lime Fiord, only yielded a total of 2,600,000 oysters in the 1951/52 season as compared with 3,100,000 in 1950/51.

Imports: Danish imports of fishery products in 1951 were valued at about 26,900,000 kroner (US$3,900,000). The value of fresh fish imported (mainly from Swedish landings) totaled about 11,400,000 kroner (US$1,650,000). Imports of cured products amounted to 15,500,000 kroner (US$1,600,000), of which salted cod and herring accounted for about 14,100,000 kroner (US$2,000,000) and canned fish about 1,200,000 kroner (US$173,000). Imports of fish meal and herring oil accounted for about 14,900,000 kroner (US$12,200,000), medicinal fish oil about 6,900,000 kroner (US$1,000,000), and other kinds of fish oil and whale oil 41,100,000 kroner (US$5,900,000).

Exports: Total exports in 1951 amounted to about 120,700 metric tons, valued at about 187,500,000 kroner (US$27,100,000) as compared with about 122,700 metric tons and 169,500,000 kroner (US$24,500,000) in 1950. Of this, about 91,000 metric tons were fresh fish valued at about 147,000,000 kroner (US$21,200,000) as compared with about 88,000 metric tons and 128,000,000 kroner (US$18,500,000) in 1950. Further, 15,400 metric tons of various shellfish and cuttlefish were exported fresh, valued at about 3,900,000 kroner (US$564,000) as compared with about 22,200 metric tons and 4,900,000 kroner (US$708,000) in 1950. The export of cured fish products (including shellfish) amounted to about 14,200 metric tons in 1951 valued at about 36,400,000 kroner (US$5,300,000) as compared with about 12,500 metric tons and 36,200,000 kroner (US$5,200,000) in 1950. Of these exports, canned goods reached a total of about 3,300 metric tons, valued at 17,000,000 kroner (US$2,500,000), and salted products of herring and cod reached about 10,700 metric tons valued at about 18,300,000 kroner (US$2,600,000).

Fishery Loans: In the fiscal year 1951/52 the Fisheries Bank granted long-term loans totalling 3,016,800 kroner (US$440,000) as compared with 5,788,550 kroner (US$836,000) in 1950/51.

Fishery Legislation: The basic fishery laws were revised in 1951 both for fresh-water and salt-water fisheries. Together with the extensive legislation on the domestic and export fish trade passed in 1950, these new laws have created a modernized basis for public control of production and distribution of fishery products and byproducts.

Hungary

FRESH-WATER ELECTRICAL FISHING EXPERIMENTS: Experiments in fresh water to catch fish by electricity have been carried out in Hungary the past few years. The results are considered successful, reports The Fishing News of January 17, a British trade magazine. Sponsored by the National Fish Breeding Institute, the aim was to discover the most suitable type of apparatus and to find out if the current had any harmful effect on the fish and on fish breeding. Electrical fishing proved particularly successful in waters where plants, reeds, snags, and roots prevent the use of traditional fishing gear. Field experiments were carried out for 11 months mainly in the autumn and winter of 1950-51.

The apparatus finally adopted consisted of an electric generator capable of producing up to 300 volts and powered by an 8 hp. motor. It was found preferable to use the apparatus from a small craft, to which a copper strip had been fitted to the keel to act as a negative electrode.

The postive electrode is fitted to the end of a wooden pole and attached to the generator by a length of cable. It consists of a basket-like construction covered with a fine metal mesh. The fisherman stands in the stern of the craft, which is kept in constant motion by an oarsman. When the craft is in a fishing area, the positive electrode is lowered into the water and the current switched on. An electric field is created around the positive electrode and any fish within a radius of one to two meters (3 to 6½ feet) is attracted to the positive electrode. It is stunned by the current and can be lifted out of the water in a net.

Although the radius of the current is small, the fact that the electrode can be dipped into the water about 100 times an hour means that a large area of water can be covered. It was found that the best results were obtained in cooler weather when the fish were more sluggish, and fishing can even be carried out when there is thin ice on the water. Fish which are too small or are otherwise unsuitable can be left to recover and swim away. Also, small fish are less attracted by the current than bigger ones.

Direct current is used, as alternating current paralyzes the fish and makes them sink to the bottom almost immediately. The strength of the current used varies considerably, but even when full power is used it is not practicable to fish in water more than six feet deep. The electrode is dipped in the water for up to eight seconds at a time.

The experiments showed that electric fishing while not suitable for big rivers and large expanses of water, gives excellent results when used in favorable areas. One boat fishing for six weeks on the Nagyberen River, where traditional methods are impracticable, caught 5½ metric tons of fish.

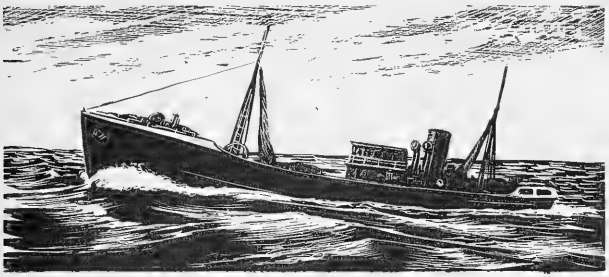
It is intended to encourage fishing by electricity in appropriate waters. The method is also to be used to rid rivers and ponds of cannibal fish and to catch fish for breeding in ponds.

Iceland

FISHERIES OUTLOOK FOR 1953: The beginning of the main winter fisheries took place in the face of contracting markets for both frozen and salted fish and stocks of processed fish which are already taxing Iceland's limited storage facilities. The outlook is so poor that the freezing plants have so far been unwilling to agree

to a renewal of last year's price of I.kr. 1.00 per kilo (about 2.8 U. S. cents per pound) for cod (gutted with head on), to be paid to the motorboat operators. Price discussions are now going on, after the actual start of fishing operations has taken place, states a January 28 U. S. consular dispatch from Reykjavik. The most favorable market outlook at present is for stockfish (dried cod). This has been a significant export commodity only during the past two years, but will probably be of increasing importance in the future as Iceland develops its own markets for this commodity. Iceland's largest buyer of stockfish is at present the Federal Republic of Germany, which re-exports the fish to African customers. Iceland lacks experience in fish drying for export, and the weather at the beginning of the season is somewhat risky, but the prospects are that drying will be done on a much larger scale this year.

PLAN TO INCREASE FISHERY PRODUCTS EXPORTS: A representative of the Icelandic Foreign Office's Commercial Section is now in Warsaw negotiating a renewal of the Icelandic-Polish trade agreement, which expired at the end of 1952. The increasing importance of compensation trade in Iceland's search for markets for fisheries products has led to attempts to arrange triangular deals by which Iceland will buy more of a product than she can consume, and re-export the surplus. It can be expected that Iceland will attempt to re-export Spanish oranges to the Faroe Islands and certain "curtain" countries, particularly Hungary. The Icelandic Chamber of Commerce has taken the lead in promoting this type of trade which, it is hoped, will improve Iceland's export possibilities by making it possible for her to offer her customers an attractive "package" of commodities, and at the same time enabling Iceland's suppliers to take more Icelandic fish.



ICELANDIC STEAM TRAWLER.

U. S. ARMY VETERINARIAN VISITS FREEZING PLANTS: The Chief Veterinarian for the U. S. Army's European Command visited Iceland in January to inspect fish freezing plants as a possible source of supplies of fish to the U. S. Army. The Army's needs, procurement, and sanitary inspection procedures were discussed at a meeting attended by representatives of the organizations exporting frozen fish, the Ministry of Commerce, and the Legation. A number of freezing plants in the Reykjavik, Akranes, Keflavik area were inspected and the Veterinarian reported that he was very much impressed with the plants he saw. He is recommending that the plants be put on the Army's approved list. U. S. Army requirements are for 250,000 pounds of fish monthly; and while this is a comparatively modest amount, the Icelandic producers are anxious to supply the U. S. Army because of increasingly poor prospects for marketing the fish caught during the season just beginning. (Editor's Note: Although not specifically stated, requirements are for U. S. troops in Iceland only. Purchase of fish abroad to meet requirements of troops in United States not contemplated, according to the U. S. Army Quartermaster Corps.)

MOTORBOAT-FISHING-FLEET LABOR DISPUTE: A strike at the beginning of the main South Coast season involved approximately 650 seamen and immobilized the motorboat fishing fleet in Reykjavik and Hafnarfjordur. It began on January 1 and a settle-

ment was reached on January 21. The principal demand of the strikers was for an increased wage guarantee. The settlement substantially met this demand and introduced a guarantee for the latter half of the year, which the previous agreement did not contain.

RENEWAL OF MOTORBOAT CURRENCY AGREEMENT: Negotiations are now taking place regarding the renewal of the currency retention scheme for the motorboat fishing fleet. The motorboat owners are attempting to obtain a larger share of the foreign exchange proceeds of their exports. As a collateral demand they are asking that they be allowed to name one member of the Government's Economic Board, as they contend that no one on the present Board knows the fishing industry well enough. The owners are also pressing for a reduction in the interest rate of the banks on operational loans to fishing-boat operators, from the present 7 percent to 5 percent. The prospects are for a renewal of the currency scheme on the same basis as before, with a possible concession on the question of interest rate.

India

FISHERIES TO RECEIVE AID FROM NORWAY: India's fisheries will be provided with fishery technical experts and equipment from Norway as part of a tri-partite agreement signed recently by representatives of India, Norway, and the United Nations. The agreement includes an over-all plan for improving the economic and social conditions in a limited area of Travancore-Cochin, on the west coast of India, states the Norwegian Information Service on February 5.

Norway will contribute 2.7 million rupees (US$560,000) in the 1953/54 fiscal year toward technical aid to a community of some 12,000 fishermen living on the shores of the Ashtamudi Lagoon in the estuary of the Callada River. In the same period, the Government of India will spend 10.6 million rupees (US$2.2 million) on developing fisheries in this same area.

Among the projects that will have top priority are: (1) the installation of Norwegian engines in Indian fishing craft; (2) promoting rational methods of handling fish; (3) construction of an ice-making plant for the fisheries; (4) purification of drinking water; and (5) establishment of a health center.

The Norwegian assistance will be financed by a fund voted by the Parliament, later to be supplemented by the proceeds from a nationwide collection drive now being organized.

Iran

GOVERNMENT TAKES CONTROL OF IRANIAN-SOVIET JOINT FISHERY COMPANY: The Iranian Government took over control on February 1, 1953, of the former Iranian-Soviet joint fishery company in Iran. The company will now operate under the name of the National Fisheries Company, according to recent newspaper press releases from that country. The 25-year contract (signed in 1927) expired on January 31, 1953, 25 years after the agreement went into effect.

The Russian officials of the jointly-owned firm closed their accounts shortly after the first of February, according to the press reports quoted by U. S. Embassy

dispatches from Tehran. The financial and administrative affairs of the firm will now be managed by Iranian officials and the Soviet Government will no longer have any interest in its financial affairs. Iran officials have replaced former Soviet officials in the accounts department. Iranian Government representatives visited various installations of the fisheries and issued new instructions for each section. Among the technical staff, 29 Soviet nationals continued with their work to prevent a breakdown of operations pending their replacement.

The 1927 agreement provided that when the contract expired the operations of the company would cease and the assets would be divided equally between the two countries. One Iranian Government official expressed confidence that the procedure of liquidating the assets would run smoothly, and when finally settled some Russian experts may remain in Iran to help operate the new company.

It is understood that the Iranians plan to pay in fish for the Russians' half of the physical properties and give them the right to buy all of the new company's output.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1952, P. 37.

Japan

CANNED AND FROZEN TUNA EXPORT QUOTA TO UNITED STATES INCREASED: The export of an additional 3,000 short tons of frozen tuna and 150,000 cases of canned tuna to the United States for the period April 1952 to March 1953 has been authorized by the Japanese Ministry of International Trade, reports a February 17 U. S. Embassy dispatch from Tokyo.

The Japanese Government on April 7, 1952, established a quota for the export of frozen and canned tuna to the United States for April 1952-March 1953. The original quota for frozen tuna was 12,000 short tons; last September this was increased by 6,000 tons to 18,000 tons; and the latest increase of 3,000 tons raises the quota to 21,000 tons. The original quota for canned tuna was 1,000,000 cases and the present increase raises it to 1,150,000 cases.

NOTE: THERE HAS BEEN SOME CONFUSION AS TO WHETHER THE QUOTA WAS EXPRESSED IN METRIC OR SHORT TONS. HOWEVER, ACCORDING TO RECENT INFORMATION IT IS REPORTED THAT THE JAPANESE GOVERNMENT HAS ALWAYS REPORTED THE QUOTA FOR FROZEN TUNA EXPORTS TO THE UNITED STATES IN SHORT TONS.

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FISHERIES PRODUCTION OUTLOOK THROUGH 1957: Japanese fisheries production is expected to steadily rise each year until it reaches approximately 10.8 billion pounds in 1957 as compared with the 7.9 billion pounds produced in 1951 and an estimated 8.5 billion pounds in 1952 (see table). The 1957 estimate represents a 27-percent increase above the prewar level of 1936. This prediction, published in the Japanese press (Kyodo, December 3, and Tokyo Shinbun, December 2), was made by the Japanese Fisheries Agency, reports a U. S. Embassy dispatch from Tokyo.

Estimated Japanese Fisheries Production, 1952-57

Year	Estimated Production	Production Index
	Billions of Lbs.	(1936 = 100)
1952	8.5	99
1953	8.9	105
1954	9.4	110
1955	9.8	115
1956	9.7	121
1957	10.8	127

The upward trend in catch is expected to result from: (1) the shift from coastal fishing to more productive offshore fishing grounds, including exploration and development of some of the

more distant areas; (2) improvement in coastal fisheries with respect to mackerel-pike, cuttlefish, and mackerel, and the revival of the sardine fisheries as a result of increased abundance through natural causes; (3) application of conservation measures to reduce overfishing in inshore and coastal fisheries and to insure the best utilization on a sustained-yield basis; and (4) continued improvement in the whaling catch, reaching prewar levels.

The Japanese Fisheries Agency anticipates that fishermen will require government financial and other assistance to increase fishing fleets and effect nec-

BULL TRAWLERS USED BY JAPANESE FISHERMEN IN THE EAST CHINA SEA. OPERATED IN PAIRS. FUKUOKA, KYUSHU, JAPAN.

essary changes in the types and locations of fisheries activities to attain the production goal set for 1957.

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WHALE-CATCHER BOAT LOCATES GOOD TUNA GROUNDS IN CORAL SEA: Experimental fishing by a Japanese whale catcher (Fumi Maru No. 15) en route to the Antarctic has revealed indications of good catches of tuna in the Coral Sea between Australia and New Caledonia, according to a Japanese press report (Mainichi Shimbun, December 20). This catcher (attached to the factoryship Nisskin Maru) did some experimental fishing with long lines in waters south of the equator. Good tuna fishing was indicated at 19°43' S. latitude and 156°32' E. longitude. The catch of the brief experimental fishing consisted of 11 yellowfin tuna, 8 albacore, 1 broadbill swordfish, and 15 Spanish mackerel. This is equivalent to a Japanese tuna boat catch of 350 baskets of gear on regular long-line operations, or 256,000 pounds per haul.

This information was received with considerable interest by the tuna fishermen at Misaki, one of the leading tuna ports in Japan. Misaki is 3,480 miles from the new tuna area. Tuna fishermen believe this distant fishing ground can be fished by the large-sized tuna boats (350 gross-ton class) which have been completed or are under construction. Indications are that Japanese boats will soon be making trips to this newly-reported tuna area to determine the possibility of full-scale commercial operations.

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WHALE OIL SOLD TO WEST GERMANY: An agreement for the sale of 12,250 metric tons of Japanese whale oil to West Germany was reached recently. This should go a long way towards solving Japan's difficulty in disposing of the bulk of its 1951/52 Antarctic whaling production, according to a Japanese press report (Kyodo, December 12, 1952). This amount is 35 percent of Japan's total production (34,700 metric tons) of whale oil for 1951/52. In exchange for the whale oil (in storage in Europe), West Germany is expected to sell Japan 26,000 metric tons of Cuban sugar.

Several factors contributed to Japan's inability to dispose of the 1951/52 Antarctic production of whale oil:

1. On the export market: (a) whale oil was banned by the United Kingdom, one of the largest consumers, because of its import curtailment policy; (b) Germany, the Netherlands, and other countries in Europe suffered the loss of markets due to Japan's excessive export credit; and (c) the supply of whale oil increased.

2. On the domestic market: the sale of whale oil has been adversely affected by imports of cheap beef tallow from the United States.

The price of whale oil has been affected by the world-wide increase in the production of vegetable oils. Because of the decline in the price of vegetable oils, the whale-oil price decreased from £120 (US$336) per ton in December 1951 (the beginning of the whaling season) to £70 (US$196) per ton in May 1952 after the whaling season had ended. The price quoted in the deal with West Germany is approximately £95 (US$266) per ton.

The Japanese whaling industry is endeavoring to dispose of its whale-oil stocks in storage in Japan--approximately 23,000 metric tons. The Fisheries Committees of the Lower House on December 19, 1952, called on the Japanese Government to purchase whale oil to stabilize the price. No decision has been made by the Government on this problem.

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FISHING VESSELS LAND AT HONG KONG: Two Japanese otter trawlers landed their catches at Hong Kong on December 6, marking the first Japanese catch to be landed directly at that port in the postwar period, reports the Japanese press (Nippon Times, December 8). The two boats, owned by a Tokyo company, are part of a 13-boat fleet operating under a special license granted the firm for fishing in the South China Sea, including the area off Hong Kong. This trawler fleet is headed by the mothership Baikal Maru of 7,477 gross tons.

These landings are the result of negotiations at Hong Kong between a representative of the Japanese fishing company and Hong Kong Government officials. In discussions with Hong Kong officials regarding fishing and marketing conditions, the Japanese representative was informed that there were no legal objections to the landing of catches by Japanese fishing boats although it was expected that Hong Kong fishermen would oppose such landings. However, the officials added that the catches would have to be sold through the Government marketing system, to which the Japanese representative agreed.

The Hong Kong officials also stated that the current supply of fish was considerably below requirements since the local population has increased greatly in the past year or so, largely because of the influx from Red China. The Hong Kong fleet is apparently incapable of adequately supplying this increased need at the present time. It was believed, therefore, that landings by Japanese fishing boats would be helpful in meeting the shortage of animal protein foods.

Anticipating that Hong Kong fishermen would object to the landings by Japanese boats and wishing to prevent any adverse effect of such landings on the Hong Kong market, the Japanese company plans to limit landings by using only two trawlers of its fleet. It further plans to hold the landed catches to limited quantities and to space them over specified intervals of time to prevent a drastic drop in fish prices on the Hong Kong market. The catch of the rest of the Japanese fleet operating off Hong Kong will be carried directly to Japan.

Hong Kong fishermen have already voiced opposition to the landings of Japanese catches (Kyodo, November 29). They charged that a sharp drop (50 percent) in fish prices occurred prewar when Japanese fishing boats "suddenly dumped" their catches at Hong Kong.

According to a December 7 press report, the two Japanese trawlers landed approximately two metric tons of fish and the catch was sold through Hong Kong Government channels. The fish arrived at a time when recent adverse fishing weather had resulted in much smaller catches by Hong Kong fishermen.

The Japanese company received information from Hong Kong on December 9 that good progress had been made in clarifying a misunderstanding on the quantity of Japanese-caught fish to be landed and that the "situation was quiet." The Japanese company is anxious to avoid international friction and, therefore, carefully reviewed the situation and discussed the project with responsible Hong Kong officials before deciding to send its boats into that port.

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FISHING RESTRICTIONS OFF KOREA CAUSE CONCERN: The Japanese have expressed concern over the restrictions on fishing in areas off South Korea as a result of the "Sea Defense Zone" established by the Commander-in-Chief of the United Nations Forces, a U. S. Embassy dispatch from Tokyo dated December 29 states. It is hoped by the Japanese that a solution will be found which will allow Japanese fishermen to have access to those waters.

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JAPANESE-KOREAN DISPUTE OVER FISHING AREAS OFF KOREA: Korean President Rhee has stated his willingness to meet with representatives of the Japanese fishing industry to discuss problems of mutual interest to Japanese and Korean fisheries.

The scheduled meeting (expected to take place in February) developed from a request to President Rhee by the Japanese fishing industry to lift the Korean restrictions on Japanese fishing inside of the Rhee Line which was established by unilateral action of Korea in January 1952 by a proclamation by President Rhee. The Japanese Government has objected to Korea's action in claiming territorial jurisdiction beyond the international three-mile limit and extending into "high seas" areas. Seizures of Japanese vessels by Korean patrol boats have taken place over the last several months. These have been vigorously protested by the Japanese fishing industry operating in the waters off South Korea. This topic has received wide publicity in the Japanese press.

Although the discussions between President Rhee and his officials and the Japanese fishing delegation will be informal, fishery circles hope that they will pave the way for the solution of fisheries disputes by official negotiations which may follow between the Governments of Korea and Japan.

The newly organized Great Japan Fisheries Society is an important supporter of efforts to seek an amicable solution to the Japan-Korea dispute over fishing areas off Korea. Reorganization of this Society was begun in December 1952 and completed January 12, 1953.

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PEARL-SHELL FISHING PLANNED IN THE ARAFURA SEA: Pearl-shell fishing in the Arafura Sea (north of Australia) has been authorized by the Japanese Government for the first time in the postwar era, states a December 17 dispatch from the United States Embassy in Tokyo. Fishing will be by mothership operations on the high seas by a private company organized on December 5, 1952. Final composition of this expedition has not been decided as yet, but it is expected that it will consist of not more than one mothership (tonnage not known), 25 diver boats (50 to 80 gross tons average), and 70 Japanese divers. The fleet will probably sail from Japan in late February or early March 1953.

A total of 25 applications have been approved by the Japanese Fisheries Agency from a total of 78 received. The Agency gave preference to those who had engaged in pearl-shell fishing before the war, and all approved applicants have had such experience. Those authorized to engage in this activity will also be required to obtain special operational licenses, provided the vessels and other conditions meet Government requirements.

The Government has limited the annual catch to 1,250 metric tons to avoid catches in excess of requirements that would oversupply the limited market. The Government has also imposed a minimum oyster-size limit. The landed catch will consist only of shells 15 centimeters or larger. The catch will be brought to Japan and processed into shell buttons. It is reported a New York firm will be a principal distributor.

Prior to World War II a fleet of Japanese divers fished for pearl shells in the Arafura Sea. According to reports, the fleet numbered 170 boats and 2,200 fishermen at its peak, and produced an annual catch of 3,800 metric tons. A large part of the production was exported to the United States button markets. In 1923, the Japanese also began experiments in the culture of the pearl-shell oyster at Buton, Celebes. In 1930, a company was organized in the interest of further development in the culture of the pearl-shell oyster. This company was in existence until 1944.

Mexico

U. S. VESSELS ACCUSED OF FISHING IN MEXICAN TERRITORIAL WATERS: According to reports of Mexican commercial fishermen, approximately 30 United States shrimp fishing vessels are regularly operating off the coast of Mexico between Tampico and Tuxpan, frequently within one or two miles off the coast. These reports also indicate that the vessels carry an unusually large number of small arms. A large fleet of United States fishing vessels is also reported in Campeche Sound, according to reports transmitted by the U. S. Embassy at Mexico City in a February 13 dispatch.

United States operators of fishing boats operating near Mexican waters are notified that foreign vessels found fishing in Mexican waters without authorization from the Mexican Government may be seized by Mexican Authorities. Mexico considers its territorial waters to extend nine miles out to sea.

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STATUS OF FISHERIES, 1951: The total investment of capital in the Mexican fishery industries amounted to approximately 250 million pesos (US$29 million) as of December 30, 1951, reports the November 1952 World Fish Trade, a Danish trade periodical. Further expansion is predicted.

There were at least 36 freezing plants operating in Mexico during 1951--29 on the Pacific Coast and 7 on the coast of the Gulf of Mexico. In addition, there were 27 plants processing sardines, tuna, bonito, Spanish mackerel, and abalone for both export and domestic consumption. These processing plants are located in the states of Sonora, Sinaloa, Baja California, and Campeche.

Total exports of shrimp to the United States in 1951 amounted to 39,652,640 pounds. One-third of this total was caught in the Gulf of Mexico and the remainder in the Pacific Ocean, including the Gulf of California.

Government revenue through taxes on fishery products exports has been steadily increasing.

Norway

HUGE FISH-FREEZING AND COLD-STORAGE PLANT BEGINS OPERATIONS: A fish-freezing and cold-storage plant, considered to be the world's largest, was scheduled for testing in Bergen, Norway, late in January, according to a report in Fiskaren (January 14), a Norwegian trade periodical. The plant was expected to begin accepting herring for freezing in half-boxes (44 pounds) at a rate of 2,500 boxes per 24-hour day. During the trial operation, storage will be available for about 40,000 boxes.

When the plant is in full operation later in the summer, it will be able to freeze 5,000 half-boxes per 24-hour day and store 12,000 metric tons of fish, including herring. The dry-freezing capacity will be 75 metric tons per 24-hour day, with special consideration for tuna. The plant is equipped with refrigeration machinery of American manufacture.

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WHALE-MEAT INDUSTRY: Production: A total of 6,800 metric tons of whale meat was produced in Norway in 1952, compared with 5,420 metric tons in 1951, reports a December 15, 1952, U. S. Embassy dispatch from Oslo (see table). It is expected that the future annual production will remain at between 5,000 and 7,000 metric tons.

Table 1 - Norwegian Production of Whale Meat, 1951-52

Kind of Whale-Meat Product	1952	1951
	(Metric Tons)	
Steak	2,500	2,300
Manufacturing meat	4,300	1,150
Animal food		1,970
Total	6,800	5,420

The main whale-catching districts are located on the west coast of Norway which has about 100 deep-freezing plants. The total capacity of these plants is well over 100 metric tons per 24-hour day. There are 4 shore whaling stations, operating 3 catcher boats each. These catcher boats are mainly engaged in catching large whales, which they tow to the shore stations for processing. In addition, there are 240 smaller boats catching smaller whales. The number has been reduced from over 400 in previous years in order to avoid reduction of the number of whales. The small boats, in contrast to the whale catchers of the shore stations, strip the whales of blubber and cut the meat in the catching area. After the meat has cooled, it is iced.

The Norwegian Government, through the Office of Whaling of the Ministry of Industries, issues licenses valid for one year to small boat owners who wish to engage in whale catching. Licenses were issued to 240 boats for the 1952 season, less than the number issued in previous years. In order to avoid depleting the whale supply, the Government by licensing larger boats, is attempting to encourage whale catching farther from the Norwegian coast.

The catching season for small boats is from March 15 through September 14, with the exception of the period July 1 through 20. The catching season for the shore stations is from April 20 through October 19. The shore stations are allowed to catch whales during the July 1-20 period, but they are not allowed to market whale meat during this period. The shore stations are issued licenses valid for 7 years.

Attempts have been made to have whales processed within 24 hours after killing, but this is very difficult to control. In any event, meat intended for sale for human or animal consumption is inspected and passed by government inspectors. Meat which does not pass inspection is processed into other products.

Processing Regulations: Regulations on the handling and packing of whale meat specify, in part, that:

All whale meat packers must be authorized by the Ministry of Industries.

As soon as possible after catching, the blood shall be drawn from all whales which are to be towed ashore for processing.

Prior to towing, all whales shall be opened in order that they may be eviscerated during towing.

The whales shall be stripped of blubber as soon as they have been brought ashore.

During processing, the whale meat is to be graded as follows:

1. Whale steak - Meat cut from the back or side of the whale, of at least a 50-square-centimeter cross section area down through the grain.

2. Manufacturing meat - The same meat as whale steak, but of smaller cuts.

3. Whale-tongue meat - The light colored meat from the tongue.

4. Animal food or waste meat - All other meat from the whale.

The meat should be deep frozen within 72 hours from the time freezing is started.

Exports of grades of whale meat other than "whale steak" or "manufacturing meat," and whale meat which is not frozen, are prohibited.

Exports: Exports of whale and seal meat from Norway in the period January-October 1952 totaled 3,861 metric tons (table 2). In the entire year 1951 exports totaled 1,144 metric tons. Frozen whale meat exports are not available separately, but seal meat exports are an insignificant part of the total. About 56 percent of the total 1952 production of whale meat has been exported at an average f.o.b price of 1.68 kroner per kilo (10½ U.S. cents per pound). About 90 percent of total exports went to the United Kingdom.

Wholesale Frozen Whale-Meat Prices: Prices paid by Norwegian wholesale distributors for frozen whale steak for human consumption has varied from 2.75 to 3.25 kroner per kilogram (17½-20½ U.S. cents per pound) during the last few years. The price of frozen whale meat for animal consumption has varied between 1.00 and 1.50 kroner per kilogram (6½-9½ U.S. cents per pound).

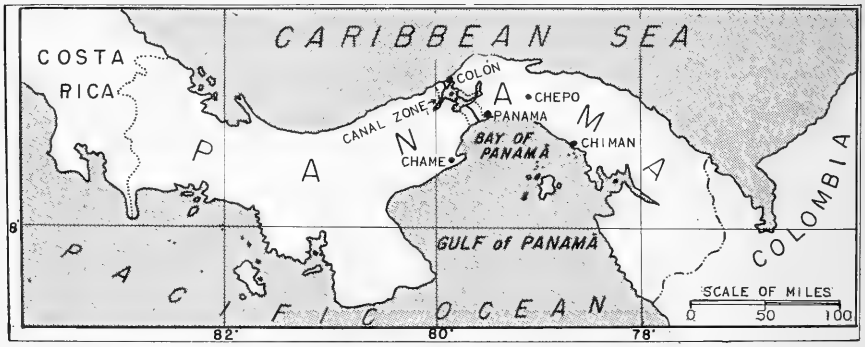
Table 2 - Norwegian Exports of Whale and Seal Meat, January-October 1952 and January-December 1951

Country of Destination	1952 January-October			1951 January-December		
	Quantity	Value (f.o.b.)		Quantity	Value (f.o.b.)	
	Metric Tons	1,000 Kroner	1,000 US$	Metric Tons	1,000 Kroner	1,000 US$
United States	292.2	693.9	97.0	16.8	42.3	5.9
Belgium	5.0	8.8	1.2	-	-	-
Denmark	2.3	2.3	.3	-	-	-
Sweden	3.3	10.5	1.5	10.1	6.6	.9
United Kingdom	3,537.7	5,718.5	799.8	398.4	352.5	49.3
Czechoslovakia	-	-	-	498.2	930.9	130.2
Western Germany	20.5	44.6	6.2	17.0	32.4	4.5
Austria	-	-	-	203.0	390.0	54.5
Total	3,861.0	6,478.7	906.1	1,143.5	1,754.7	245.4

One of the main exporters of whale meat (the only significant exporters of frozen whale meat for human consumption to the U. S.) indicated that in a normal catching season, if exports to the United Kingdom were reduced and favorable prices on the American market prevailed, he would be able to offer the following quantities for export to the U. S. annually: 1,000 metric tons whale steak, 1,000 tons manufacturing meat, and 2,000 tons whale meat for animal feeding. A representative from the Whaling Office of Ministry of Industries considered these figures too high, and believed that no more than about 2,000 tons of the Norwegian production of manufacturing meat and animal food could possibly be exported.

Panama

BAIT-FISHING VESSELS NO LONGER REQUIRED TO PURCHASE FUEL AND LUBRICANTS IN PANAMA: The purchase of fuel and lubricants in Panama by licensed bait-fishing vessels is no longer required. Panamanian Decree No. 73, dated February 13, modified Article 8 of Decree No. 30 (December 22, 1952) which had specified that such purchases must be made in Panama. Henceforth, licensed boats will be required



only to buy their supplies and to make small repairs there. Decree No. 73 was effective commencing February 13, reports a February 16 dispatch from the U. S. Embassy at Panama.

This modification of Decree No. 30 is the direct result of the Panamanian Government's recognition of the fact that it now does not have available practical means for selling the fuel and lubricants in Panamanian territory and for collecting the related import duties. The oil companies refused to assist in collecting these duties.

Spain

REVIEW OF THE TUNA FISHERIES: Landings: The total catch of tuna, albacore, and bonito in Spain (including the Canary Islands) for the first ten months of 1952 amounted to 26,565 metric tons (table 1), reports a January 2 U. S. Embassy dispatch from Madrid.

According to Spanish classifications, "tuna" includes the yellowfin and bluefin species, while skipjack, yellowtail, and bonito are classified under the general heading of "bonito." Albacore (also called "Bonito del norte") is classified separately. Data in this report are accordingly classified under three separate headings: "tuna," "bonito," and "albacore" in accordance with Spanish classifications.

Table 1 - Spanish Tuna and Tuna-Like Fish Landings (including Canary Islands), 1947-52

	Jan.-Oct. 1952	1951	1950	1949	1948	1947
	(Metric Tons)					
Tuna	4,538	7,005	8,574	15,210	10,126	15,573
Albacore	20,180	15,343	18,508	16,983	14,622	16,930
Bonito	1,847	9,989	12,964	1,405	275	858
Total	26,565	32,337	40,046	33,599	25,023	33,361

Fishing and the Fleet: The Spanish tuna fishing industry is centered chiefly in the Canary Islands and the Provinces of Huelva and Cadiz. Bonito and albacore fishing is scattered generally around the northern and northwestern littoral, with the Cantabrian region ranking first in bonito and albacore catches.

Tuna fishing off the shores of Huelva and Cadiz is from fixed nets, owned by one company. This organization is believed to be capitalized at between 75 and 100 million pesetas (US$1,892,000-2,522,000). The Spanish Government controls 52 percent of its capital stock and private Spanish interests the remainder. In 1951 it operated 218 boats of all types and employed 1,400 persons in fishing and tending its installations. Fishermen earn a fixed salary plus a percentage of the catch with average earnings amounting to about 1,000 pesetas (US$25) monthly. This firm also operates a number of canneries in this area, the output of which consists of various species of fish for export.

Tuna fishing in the Canaries supplies about 8 percent of the total fish catch in that area. There are no available data relating to the percentage of the Canary Island fleet specializing in tuna fishing. The total fishing fleet (excluding oar-propelled boats) in the Canary Islands numbers some 557 units with a net tonnage of 11,894 metric tons and a declared value of approximately 76 million pesetas (US$1,917,000).

The entire Cantabrian fishing fleet of Northern Spain in 1951 numbered 2,371 vessels (excluding oar-propelled) with a net tonnage of 56,818 metric tons. Similarly, there is no breakdown of data relating to the percentage of vessels specializing in albacore or bonito fishing. The greater part of this fleet is reported to be antiquated and badly in need of replacement. There are, however, a number of modern and well-equipped fishing vessels included in the fleet.

The fleet engaged in fishing for albacore off the Vigo area is estimated to number some 50 units of from 80 to 150 tons. Its fishing grounds are roughly described as an area 50 to 60 miles from Vigo off the Spanish and Portugese coasts and as far north as the 45th parallel, near the Grand Sole. The season generally runs from the beginning of June through the middle of October, with the larger vessels extending their operations later in the season up to the 45th parallel.

The Direccion General de Pesca Maritima states that the Spanish tuna fleet, as such, is relatively small. The Government has apparently made no special effort to develop a tuna industry since the end of the Spanish Civil War.

In 1950 the Government repealed the ban against the construction of fishing vessels of less than 100 tons and offered subsidies for the construction of new vessels and the refitting of old ones. However, new construction was hampered by the lack of raw materials, ship fittings, and the requirement that one old unit be removed from service for every new one constructed under a subsidy. Since the majority of owners possessed only one or two units, they could not afford to remove their vessels from service while awaiting the construction of new ones. The scarcity and excessive cost of ship-building materials still hamper the expansion of the Spanish fishing fleet.

Prices: Prices paid to fishermen vary throughout the different regions. The national averages for the years 1949-52 are shown in table 2.

Table 2 - Spanish Tuna and Tuna-Like Fish Ex-vessel Prices, 1949-52

	1952		1951		1950		1949	
	Pesetas Per Kilo	U.S. Cents Per Lb.	Pesetas Per Kilo	U.S. Cents Per Lb.	Pesetas Per Kilo	U.S. Cents Per Lb.	Pesetas Per Kilo	U.S. Cents Per Lb.
Tuna	6.40	7.34	6.59	7.55	5.68	6.51	4.55	5.22
Albacore	7.75	8.89	8.24	9.45	7.65	8.77	7.79	8.93
Bonito	7.05	8.08	8.44	9.68	7.26	8.32	5.24	6.01

Canning Industry: An impediment to the development of the fish-canning industry in general is the shortage of tinplate. With increased arrivals from the United States and European sources Spain is gradually allocating more to the fish-packing industry. Packers still complain, however, that they could export more fish if there were sufficient tinplate available.

About 20 percent of the approximately 425 fish-canning plants in operation during 1951 listed tuna and tuna-like fish among their specialties. The Vigo area is the leading packing center with a total of 103 plants--23 of which handle tuna, bonito, and albacore, among other species. Albacore fishing for canning in this area sprang into importance about 1944 when the scarcity of sardines forced the canning industry to turn to other species. When sardines are available, the canning of albacore is estimated to represent about 16 percent of total production, practically all of which is for export. When sardines are not available, as has been the case for the past several years, the canning of albacore is estimated to represent about 45 percent of production.

The canning facilities in the Vigo area are estimated to account for about 80 percent of the total volume of the Spanish fish-canning industry. There are no figures available as to the percentage of the national output of tuna and tuna-like fish canned in any one area. Other important areas in which tuna and tuna-like fish are canned are Oviedo, Vizcaya, Santander, and La Coruna. Of the 10 fish-canning plants in the Canary Islands, 7 specialize in canning tuna.

It is estimated that approximately 80 percent of the tuna and tuna-like fish canned in Spain is packed in olive oil, the remainder in a mild solution of vinegar and salt with a flavoring agent, such as laurel leaves. During the fishing season a small percentage of the catch is sold fresh in the local markets. There are limited cold-storage facilities in some of the principal fishing centers in Spain, but there are no special fish-freezing plants. It is reported, however, that a Vigo firm has such a plant under order but not in operation.

Exports: Various trade sources estimate exports of tuna, albacore, and bonito as between 70 and 85 percent of the total catch. The same sources state that Italy is Spain's traditional export market for tuna and tuna-like fish, followed by Switzerland, Egypt, Cuba, Great Britain, Uruguay, Mexico, United States, and Germany.

Sweden

FISH CONSUMPTION, 1949-51: The total consumption of fishery products in Sweden during 1951 amounted to 107,700 metric tons, reports a December 5 U. S. consular dispatch from Goteborg (see table). This was a decrease of 3 percent from the total consumption in 1950, and 5 percent less than for 1949.

Consumption of fishery products during the first six months of 1952, according to preliminary estimates, amounted to approximately 48,175 metric tons, compared with 44,802 tons in the similar period of 1951 and 53,855 tons in 1950.

Swedish Consumption of Fishery Products, 1949-51

Variety	1951		1950		1949	
	Total	Retail Value	Total	Retail Value	Total	Retail Value
	Metric Tons	US$	Metric Tons	US$	Metric Tons	US$
Salted herring	10,000	3,417,000	11,300	3,378,400	15,000	4,845,000
Other fish and fish preserves	97,700	47,026,700	99,800	39,454,400	98,900	40,289,535
Total	107,700	50,443,700	111,100	42,832,800	113,900	45,134,535

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CANNED FISH PRODUCTION, 1947-49: The total production of canned fishery products in Sweden in 1949 amounted to 21,435 metric tons, an increase of 5 percent when compared with 1948, and 3 percent more than in 1947, states a December 5 consular dispatch from Goteborg. Herring snacks, anchovies, and sardines (in that order) were the leading items canned.

Swedish Production of Canned Fishery Products, 1947-49

Product	1949	1948	1947
	.....(Metric Tons).....		
Anchovies	4,687	5,211	5,499
Herring snacks	7,718	6,894	6,294
Mackerel preserves	489	544	538
Sardines	3,000	3,377	2,783
Caviar and other fish roe	1,364	1,414	935
Fish balls and minced fish	3,114	2,230	3,789
Other herring preserves	547	241	332
Other fish preserves	254	318	359
Shellfish preserves	262	259	220
Total	21,435	20,488	20,749

Union of South Africa

STATUS OF COMMERCIAL FISHERIES, 1952: The commercial fishery industries of the Union of South Africa produce about 600,000 metric tons of fishery products annually and are still in the process of expanding, states a December 23 U. S. consular dispatch from Cape Town. The industries are valued at close to £13 million (US$36 million).

The fishing fleet totals 2,558 craft--36 steam trawlers, 6 motor trawlers, 46 whaling vessels, 72 motorboats, 266 sail and row boats over 13 feet in length, and 1,493 dinghies under 13 feet. Approximately 8,000 fishermen are active in the industry and a similar number are engaged in the processing plants. Over 50,000 men, women, and children in South Africa are directly dependent on the fishing industry for a livelihood.

Trawling: Cape Town is the most important of the Union's trawling centers. Of the 62,500 metric tons of the fish caught by trawlers in 1951, 58,000 tons were landed in Cape Town, while the balance was handled at Port Elizabeth, East London, and Mossel Bay. Three-quarters of the total catch consisted of stockfish (Merluccius capensis).

Pilchard Fishery: South Africa's vast pilchard potential (which prior to the World War II years had been practically completely ignored) has developed into the Union's most important fishery industry. Now over 500,000 metric tons of pilchard and maasbanker are taken annually. At present there are 15 reduction plants--11 in the St. Helena-Saldanha Bay area and 4 (with licenses for 2 more) at Walvis Bay. These plants produce over 100,000 metric tons of fish meal and approximately 5,000,000 gallons of fish oil each year. The canning plants handle 30,000 metric tons of pilchard. One of the four major pilchard factories at Walvis Bay went into operation only in September 1952, two reduction plants, with capacities of 10 metric tons per hour, were in operation when the factory opened, and a third has now been completed.

Seven vessels are presently feeding the factory, which is producing only fish meal until the cannery is completed next year. Two vessels fishing at Walvis Bay for this plant are specially designed purse seiners--larger than the usual type. It is reported that the performances of these vessels are being watched with interest by the industry.

Nearly all pilchard canning companies report record trading profits for the most recent financial year and hopes for still better results are supported by the construction work in progress along the West Coast. It appears that the aggregate output of canned pilchard is soon to increase by 50 percent and this may be the limit for some time in order to preserve the resource.

Spiny Lobster Industry: Canned and frozen spiny lobster has also assumed an important role in the Union's fishing industry. About 28,000,000 pounds of spiny lobster are caught each year off the West Coast. The Government has imposed a ceiling of 7¼ million pounds on the annual exportation of canned and frozen spiny lobster tails.

The Union consumes about 2,000,000 pounds of spiny lobster of which about 600,000 pounds are in the form of frozen tails. The frozen spiny lobster fishery has also developed into an important dollar-earning industry through exports to the United States, while the canned product is exported mainly to the United Kingdom, Australia, and the Far East.

Standard Specifications Proposed: The South African Government recently issued two notices in its official gazette concerning the introduction of proposed compulsory standards specifications for canned fish and canned spiny lobster. Although these specifications will not be enforced until two months after the publication of a final notice, the Cape Town Chamber of Commerce has, at the request of the South African Bureau of Standards, recently advised its members to dispose of their existing stocks of canned fish and canned spiny lobster, as the final notice is to be issued in the very near future.

Trends and Developments: The most serious problem facing the fishery industry along the West Coast is the lack of fresh water for use by canneries and processing plants. There is however, a Government plan afoot to supply fresh water from the Berg River to Saldanha Bay and the area around the Berg River mouth.

Development of the industry and the responsibilities of providing amenities for those engaged in the industry are in the hands of the Fisheries Development Corporation of South Africa Limited. This organization, which was established in terms of the Fishing Industry Development Act of 1944, is at present a wholly Government-owned body.

Its main objects, as set out in the Act, are briefly as follows:

1. To establish and manage schemes for the promotion or better organization of the catching of fish and to finance such schemes.

2. To carry on the business of buying, selling, processing, and marketing of fish and fish products.

3. To acquire shares in any company engaged in catching fish.

4. To establish mutual benefit societies, social clubs, townships, housing utility companies, home ownership schemes, social and health services, and any other similar undertakings which may be beneficial to fishermen.

The organization has contributed much towards the success and stability of the industry and towards the general well being and social uplift of the fishermen. The Government has also taken active steps to establish a training scheme for fishermen to improve their efficiency. A Union Mercantile Marine Trading Advisory Board has been created to deal with the question of nautical training generally, with special reference to the training of fishermen.

Research: In 1950 the South African Government had a research ship Africana II specially designed and built for research work in the South African seas. The length of the vessel is 205 feet, displacement 1,300 tons, maximum speed 13.5 knots, and a range of 6,500 miles. It is fitted with radar, wireless, and echo-sounding equipment (down to a depth of over 4,000 fathoms). Accommodation is provided for 35 officers (including six scientists) and men. Two smaller vessels are also employed for inshore research work and patrolling spiny lobster sanctuaries.

Commercial enterprise is further aided indirectly by the Fishing Industry Research Institute which carries out research of a technological nature in the fields of canning, freezing, and processing of fisheries products. The Institute is shortly to be transferred to the grounds of the University of Cape Town where a modern block of twenty research laboratories is to be erected.

Other scientists and scientific bodies are also contributing their share to the accumulated knowledge of fishes of the coast of the Union. The Zoological

Department of the University of Cape Town is, for example, engaged in marine biological studies of estuarine waters, while the South African Council for Scientific and Industrial Research operates a special unit for the purpose of carrying out basic research into the industrial potentialities of marine resources.

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SOUTH-WEST AFRICA CURTAILS PILCHARD FISHING: The administration of South-West Africa set a limit on the number of pilchard fishing vessels each factory may operate at Walvis Bay, states a January 5 U. S. consular dispatch from Cape Town. Each factory will be limited to 24 vessels, except in cases where factories already have more than this number operating. It is reported that pilchard schools are so large that vessels have caught more fish than they can carry and are forced to discard some of the catch. Another factor prompting this action is the vessel congestion at fishing factory jetties where due to unloading delays fish rot in the holds. Now, no vessel may wait more than 12 hours before unloading.

United Kingdom

WHITE FISH AND HERRING INDUSTRIES BILL INTRODUCED: The "White Fish and Herring Industries Bill" introduced into the House of Commons on December 15, 1952, will provide grants towards the cost of building and equipping vessels for inshore and near- and middle-water fishing. The White Fish Authority stated in its first annual report that 75 percent of these vessels are over 30 years old, reports a December 18 U. S. Embassy dispatch from London.

Exchequer payments over a period of ten years will be authorized in the amount of £9 million (US$25 million) to the White Fish Authority and up to £750,000 (US$2,100,000) to the Herring Industry Board. The terms of the grants will apply only to vessels or engines ordered after July 1952. Thus, working owners will be eligible for a grant of 25 percent of the cost, with a maximum of £4,000 (US$11,100), and in other cases the grant will be 20 percent of the cost. Working fishermen also are eligible for grants for 25 percent up to a maximum of £1,000 (US$2,800) for new engines.

Under the Sea Fish Industry Act, 1951, the White Fish Authority may borrow up to £15 million (US$42 million) and the Herring Industry Board under its empowering legislation up to £2.5 million (US$7 million). These limits have now been raised to £25 million (US$69.6 million) and £4 million (US$11 million), respectively.

The existing white fish subsidy will be continued until March 31, 1958; the total amount allocated for such subsidy is now £7.5 million (US$20.9 million) but this limit may be raised to £10 million (US$27.8 million) subject to an affirmative resolution of the House of Commons.

The grants to be made by the Herring Industry Board towards the cost of new vessels and engines are similar to those of the white-fish industry. Furthermore, the powers of Ministers to make grants to the Board for promoting the sale of herring, the conversion of surplus herring to oil and meal, and other purposes will be extended for ten years from the passage of the Bill and the maximum payable is to be raised from £1.5 million to £3 million (US$4.2 to 8.4 million). The provision for grants for new vessels and engines does not apply to Northern Ireland, but the other provisions relate to the United Kingdom as a whole. A financial memorandum which accompanied the Bill estimated that during the coming financial year

(April 1, 1953, to March 31, 1954) grants will total £325,000 (US$905,000); advances to the Board in respect of boats and engines will amount to £120,000 (US$334,000); and the white fish subsidy will cost £1,950,000 (US$5,400,000).

None of the provisions of this Bill affect distant-water trawler fleets.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JANUARY 1953, P. 66.

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HERRING MARKETING FUND PAYMENTS, 1951/52: In the fiscal year ending March 31, 1952, the Herring Industry Board was advanced £95,000 (US$264,000) from the Herring Industry Vote (Government grants), which was applied to loans to fishermen for provisions, reconditioning, and equipment of boats. No advances for these purposes are scheduled to be made after August 2, 1952.

Also, from the Herring Marketing Fund the Board was advanced £257,000 (US$715,500) for working capital, largely for the herring meal and oil schemes. There were no loans granted during the year for export promotion such as was previously granted British kipper exporters for assistance in breaking into the United States market, reports a January 6 U. S. Embassy dispatch from London.

U.S.S.R.

RUSSIAN FISHERIES STATUS, 1952: The Russian catch of fish in 1952 was 70 percent greater than in 1940, and the capacity (presumably its gross tonnage) of its fishing fleet was 3.2 times that of the prewar fleet, according to a report by a member of the Politburo published in the January 17 issue of The Fishing News, a British trade magazine. By 1955 the capacity of the fishing fleet would be increased to 4.5 times the prewar figure. Before World War II Russian fishermen landed the third largest catch in the world, estimated at 1,560,000 metric tons. Only the United States and Japan surpassed this catch.

The deep-sea catch amounted to 66 percent of the total 1952 landings as compared with the 1940 figure of 48 percent. While the catch off the Murmansk coast and the Baltic Sea was increasing satisfactorily, landings for the Sea of Azov, the Black Sea, the Caspian Sea, and Far Eastern fishing grounds were light.

There was every possibility that the total catch might be increased at an even higher rate than in the past, and that the output of high-quality fish products might also be considerably increased so as to fulfil the assignments of the current Five Year Plan--namely, to raise the catch to more than twice the 1940 level. To carry out this task it would be necessary to expand the number of coastal bases serving the fishing fleet and to build new ones, to build still more fish-processing factories, to increase the mechanization of catching and processing operations, and to expand the program for building fishermen's houses.

A large number of skilled fishery personnel--captains, navigators, and mechanics--have been trained in postwar years, though there is still a shortage of such men. There were in 1952 about 12,800 men under training as compared with 740 in 1940, stated the member of the Politburo.

The inland breeding of fish in ponds and reservoirs is another aspect of the fishing industry in the Soviet Union. The construction of the huge hydro-electric power stations on the Volga and the Don, as well as on the Dnieper, the Kura, and the Amu Darva rivers, had resulted in the establishment of immense reservoirs (in-

land fresh-water seas) which if properly developed could be the basis of fish-breeding on a vast scale and would lead to a large increase in stocks of bream, carp, pike, perch, and other fish.

The changes effected in the river system as a result of the hydro-electric power program, however, would substantially alter the natural conditions of fish propagation in the Caspian and Azov Seas, and would involve the intensive development of the breeding of the valuable species found there in order to prevent a depletion of stocks. The valuable sturgeon fishery, which was conducted by the Soviet Union under an agreement with Iran, is located in the South Caspian.

Hatcheries and special fish ponds must, therefore, be constructed on a large scale, stated the member of the Politburo. He complained that the Soviet Ministry of Fisheries had been very slow to carry out these measures. Ponds on collective farms are potentially a rich source of fish supplies. A big building program is envisaged. The levels to which the productivity of such ponds could be raised was shown by the experience of fish farms in three provinces in the Ukraine, where a number had achieved a yield of 1.5 to 2 tons of fish per pond hectare (just over two acres) per year.

In 1952 the Soviet Union claims that its cold-storage capacity for all frozen foods, including fish, had more than doubled, and that by the end of the current plan in 1955 it would be more than four times that of 1940. Delays in equipping the distribution network with mechanically-operated refrigeration plants were rapidly being overcome. In 1948 there had been 1,650 centers equipped with such plants; in 1952 there were 18,000, and by 1955 it was expected to total 40,000 plants.

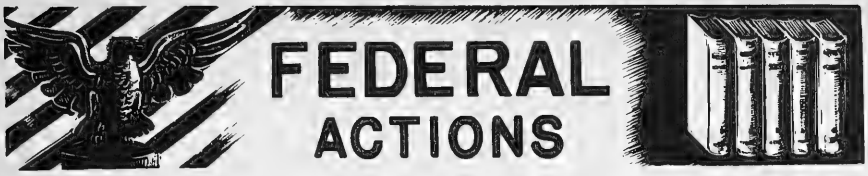
The number of self-propelled refrigerator ships--mostly engaged in the fishing industry--was more than doubled in 1952, and by 1955 it would reach three times the prewar figure.

The five-year plan for 1951-55 was considered at the Communist Party conference held in Moscow recently, reports the February 1953 World Fishing, a British trade periodical. It estimates that the production of fish in 1955 will be 58 percent greater than in 1950. But it must be remembered that the target figure for the previous five-year plan was not achieved. It was set at 2,250,000 metric tons, but 1950 production was only 1,800,000 tons.

CANNED MACKEREL QUALITY ENHANCED BY BLANCHING FISH BEFORE FREEZING

In freezing mackerel for canning it was found that blanching for 7 to 8 minutes before freezing enhanced the quality of the canned product. Dipping in ascorbic acid solutions before freezing prevented non-blanched mackerel from becoming rancid, but had no effect on blanched mackerel. (Report of the Technological Laboratory of the Danish Ministry of Fisheries 1951.)

--World Fisheries Abstracts, vol. 3, no. 6, (Nov.-Dec. 1952), p. 1.



Economic Stabilization Agency

WAGE AND SALARY CONTROL SUSPENSION ORDER INTERPRETATION: This Interpretation 1 of Executive Order 10434, February 6, 1953, appeared in the Federal Register of February 19, 1953.

QUESTIONS AND ANSWERS ON THE SUSPENSION OF WAGE AND SALARY CONTROLS BY EXECUTIVE ORDER 10434, ISSUED FEBRUARY 6, 1953 [1]

1. Q. Do wage, salary or other compensation adjustments made on or after February 6, 1953, require approval under the Defense Production Act of 1950, as amended?

A. No.

2. Q. May new wage, salary, or other compensation adjustments be made retroactive to a date when controls were in effect?

A. Any adjustments determined or agreed upon on or after February 6, 1953, may be made without violating the Defense Production Act of 1950, as amended. This does not determine, however, that such retroactive payments are or are not permissible tax deductions for the year in which the services paid for were performed; or that such retroactive payments will necessarily be recognized as permissible reimbursable expense by Government procurement agencies, under the statutes applicable to their operations.

3. Q. What is the effect of the suspension of wage and salary controls on wage and salary agreements or determinations by private parties which were made before February 6, 1953, where petitions were pending before the stabilization agencies?

A. The wage and salary adjustments contained in "petitions pending" before the wage and salary control agencies may be put into effect at this time as of the proposed effective date. Agreements expressly conditioned on the approval of stabilization agencies are deemed approved according to the Executive Order.

4. Q. What is a "petition pending" before the stabilization agencies within the meaning of Executive Order 10434?

A. A petition pending before the stabilization agencies is any petition, including petitions for review, reconsideration or appeal, properly filed in accordance with the applicable procedural regulation on or before February 6, 1953, and not disposed of on or before February 6, 1953.

5. Q. A party, who has exhausted all remedies available under the applicable procedural regulation, has filed a request for further reconsideration of the previous action by the appropriate agency. Is a "petition pending" within the meaning of Executive Order 10434?

A. No. A petition is not pending where a party invokes a procedure not provided for in the applicable procedural regulation.

6. Q. Is a petition for review, reconsideration, or appeal "pending" if it has not in fact been filed but the time within which it could have been filed has not expired?

A. No. Only those petitions which were actually filed with the appropriate agency on or before February 6, 1953, are "pending" within the meaning of the Executive Order.

7. Q. A petition for approval of a wage, salary, or other compensation adjustment was denied or modified by a stabilization agency. May such adjustment now be made in full, retroactive to the proposed effective date?

A. A decision or agreement may now be made to effectuate such adjustment without violating the Defense Production Act of 1950, as amended. This does not determine, however, that such retroactive payments are or are not permissible tax deductions for the year in which the services paid for were performed; or that such retroactive payments will necessarily be recognized as permissible reimbursable expense by Government procurement agencies, under the statutes applicable to their operations.

8. Q. A wage, salary, or other compensation agreement was executed before February 6, 1953, and provided for adjustments subject to stabilization agency approval, but a petition was not filed with the appropriate agency on or before February 6, 1953. What adjustments may now be made?

A. A decision or agreement may now be made to effectuate such adjustment without violating the Defense Production Act of 1950, as amended. This does not determine, however, that such retroactive payments are or are not permissible tax deductions for the year in which the services paid for were performed; or that such retroactive payments will necessarily be recognized as permissible reimbursable expense by Government procurement agencies, under the statutes applicable to their operations.

9. Q. What effect does Executive Order 10434 have upon enforcement proceedings?

A. The Executive Order does not excuse violations committed prior to February 6, 1953. The stabilization agencies are continuing to process enforcement actions.

Issued: Washington, D. C., February 17, 1953.

ARTHUR S. FLEMING,
Acting Economic Stabilization Administrator.

[F. R. Doc. 53-1693; Filed, Feb. 17, 1953; 1:38 p. m.]

[1] These questions and answers are applicable to the programs administered by the Wage Stabilization Board, the Wage Stabilization Committee, the Office of Salary Stabilization, and the Railroad and Airline Wage Board, formerly contained in Title 32A, Chapter IV.

Selective Service System

MANPOWER POLICY FOR COMMERCIAL FISHING INDUSTRY: A manpower policy for the commercial fishing industry was issued by the Director of the Selective Service System on March 5, 1953, as Operations Bulletin No. 91.

Since food has its source in commercial fishing as well as in agriculture, the principles relating to agricultural manpower contained in the attachments to Operations Bulletin No. 72, Subject: "Policy on Agricultural Manpower," shall be applied in the classification of registrants engaged in the commercial fishing industry, states the Bulletin. Local boards may contact the Defense Fisheries Administration, U. S. Department of Interior, through its field offices listed below, which when requested will furnish information as to the essentiality of registrants engaged in the commercial fishing industry.

FIELD OFFICES OF
THE DEFENSE FISHERIES ADMINISTRATION
U. S. DEPARTMENT OF INTERIOR

LOCATION AND AREA COVERED	ADDRESS
Boston, Massachusetts The Boston office covers the States of Maine, Massachusetts, and Rhode Island.	Fish and Wildlife Service, Market News Service, 10 Commonwealth Pier, Boston 10, Massachusetts
New York City, New York The New York office covers the States of New York, Connecticut, New Jersey, and Delaware.	Fish and Wildlife Service, Market News Service, 155 John Street, New York 38, New York
Hampton, Virginia The Hampton office covers the States of Maryland, Virginia, North Carolina, South Carolina, and Georgia.	Fish and Wildlife Service, Market News Service, 18 South King Street, Hampton, Virginia
New Orleans, Louisiana The New Orleans office covers the States of Louisiana, Florida, Alabama, Mississippi, and Texas.	Fish and Wildlife Service, Market News Service, Rm. 314 Customhouse, 423 Canal Street, New Orleans 16, Louisiana
San Pedro, California The San Pedro office covers the State of California.	Fish and Wildlife Service, Market News Service, Rm. 208, P. O. Building, San Pedro, California
Seattle, Washington The Seattle office covers the States of Washington, Oregon, and the Territory of Alaska.	Fish and Wildlife Service, Market News Service, 421 Bell Street Terminal, Seattle 1, Washington
Chicago, Illinois The Chicago office covers the States of Illinois, Ohio, Michigan, Indiana, Wisconsin, and Minnesota.	Fish and Wildlife Service, Market News Service, 200 North Jefferson Street, Chicago 6, Illinois

On questions of fishery manpower matters affecting states not mentioned above, the Defense Fisheries Administration, U. S. Department of the Interior, Washington 25, D. C., may be contacted.

Commercial fishermen and other skilled workers "essential to the production of substantial quantities of fishery commodities" will be granted the same temporary draft deferments allotted to farm workers, according to an announcement by the Secretary of the Interior in mid-March 1953.

Department of State

REVISED HALIBUT FISHERY CONVENTION SIGNED BY CANADA AND UNITED STATES: A Convention for the "Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea" was signed in Ottawa on March 2 by representatives of the

SIGNING OF INTERNATIONAL HALIBUT CONVENTION. SHOWN AT THE SIGNING CEREMONY IN OTTAWA ARE: SEATED, LEFT TO RIGHT - WILLIAM C. HERRINGTON, SPECIAL ASSISTANT FOR FISHERIES AND WILDLIFE TO THE UNDERSECRETARY OF STATE OF THE UNITED STATES; THE HON. D. C. BLISS, CHARGE D'AFFAIRES, A.I. OF THE UNITED STATES IN OTTAWA; THE RT. HON. L.S. ST. LAURENT, PRIME MINISTER OF CANADA; THE HON. J. SINCLAIR, CANADIAN MINISTER OF FISHERIES; THE HON. H. LAPOINTE, CANADIAN MINISTER OF VETERANS AFFAIRS; STANDING, LEFT TO RIGHT - H.F.B. FEAVER, HEAD OF THE CANADIAN PROTOCOL DIVISION OF THE DEPARTMENT OF EXTERNAL AFFAIRS; W. L. RODMAN, ASSISTANT AGRICULTURAL ATTACHE, U. S. EMBASSY; THE HON. D. WILGRESS, UNDERSECRETARY OF STATE FOR EXTERNAL AFFAIRS, AND S. BATES, CANADIAN DEPUTY MINISTER OF FISHERIES.

United States and Canadian Governments, reports a March 2 release from the U. S. Department of State. This new Convention replaces the previous Halibut Fishery Convention and is the third revision of the Convention of March 2, 1923.

The Prime Minister of Canada presided at the ceremony which celebrated the 30th anniversary of the signing of the first halibut fishery convention between the United States and Canada. This established the International Fisheries Commis-

sion, now to be known as the International Pacific Halibut Commission. The original convention, signed in 1923, was the first international convention in the world for the management of a fishery.

* * * * *

UNITED STATES-ECUADOR FISHERY CONFERENCE: A conference between representatives of Ecuador and the United States to discuss fisheries problems of mutual concern was scheduled to begin on March 25 in Quito. The conference was expected to last a week. Discussions were to center around the seizure by Ecuador of tuna vessels, but were expected to cover the whole range of tuna fishing problems in which both Ecuador and the United States are interested, according to a Department of State representative.

The United States will be represented by William C. Herrington, Special Assistant to the Under Secretary, Department of State, as Chairman, and Warren F. Looney, Foreign Affairs Officers, Department of State. In addition, the official delegation will also include three industry advisors: Harold F. Cary, General Manager, American Tuna Boat Association, San Diego, Calif.; Donald P. Locker, French Sardine Co., Terminal Island, Calif.; and John Real, Secretary, Fishermen's Cooperative Association, San Pedro, Calif.

Eighty-Third Congress (First Session)

FEBRUARY 1953

Listed below are public bills and resolutions introduced and referred to committees or passed by the Eighty-Third Congress (First Session) and signed by the President that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown in this section only when introduced and, if passed, when signed by the President; but also shown are the more pertinent reports, hearings, or chamber actions on some of the bills shown in this section from month to month.

BILLS AND RESOLUTIONS INTRODUCED:

Alaska Statehood: H. R. 2684 (Bartlett) - A bill to provide for the admission of Alaska into the Union; to the Committee on Interior and Insular Affairs.

Also: H. R. 2982 (Saylor)...

Collisions-at-Sea Regulations: H. R. 2456 (Hart) - A bill to amend the act of October 11, 1951, authorizing the President to proclaim regulations for preventing collisions at sea, and for other purposes; to the Committee on Merchant Marine and Fisheries.

Consumers' Advisory Bureau: H. R. 2939 (Fine) - A bill to establish in the Department of Commerce a Consumers' Advisory Bureau, and for other purposes; to the Committee on Interstate and Foreign Commerce.

Food & Drug Factory Inspection Authority: S. 835 (Smith of New Jersey) - A bill to protect the public health and welfare by restoring authority for factory inspections under the Federal Food, Drug, and Cosmetic Act; to the Committee on Labor and Public Welfare.

Also: H. R. 2769 (Wolverton)...

Hawaii Statehood: H. R. 2981 (Saylor) - A bill to enable the people of Hawaii to form a constitution and State government and to be admitted into the Union on an equal footing with the original States; to the Committee on Interior and Insular Affairs.

Labeling of Foreign-Produced Trout Packages: S. 1114 - (Dworshak) - A bill relating to the labeling of packages containing foreign-produced trout sold in the United States, and requiring certain information to appear on the menus of public eating places serving such trout; to the Committee on Interstate and Foreign Commerce. (Foreign-produced trout for sale in any place other than a public eating place would have to be: packaged and properly wrapped; and each package and wrapper labeled with the word "trout" preceded by the name of country in which produced. Public eating places would be required to inform their customers the country of origin if the trout served is foreign produced.)

Also: H. R. 3400 (Budge)...

Titles of States to Lands and Resources Beneath Navigable Waters: H. R. 2478 (Yorty) - A bill to confirm and establish the titles of the States to lands beneath navigable waters within State boundaries and to the natural resources within such lands and waters, to provide for the use and control of said lands and resources, and to provide for the use, control, exploration, development, and conservation of certain resources of the Continental Shelf lying outside of State boundaries; to the Committee on the Judiciary.

Also: H. R. 2719 (Hiestand)...
H. R. 2721 (Hinshaw)...
H. R. 2722 (Johnson)...
H. R. 2726 (McDonough)...
H. R. 2860 (Poulson)...
H. R. 2948 (Graham)...
H. R. 2995 (Younger)...
H. R. 3175 (Billings)...
H. R. 3178 (Johnson)...
H. J. Res. 168 (Brooks of Louisiana)...
S. 1017 (Anderson)...

Some of the above bills do not provide for jurisdiction, use, and control of the subsoil and seabed of the Continental Shelf lying outside of the original State boundaries.

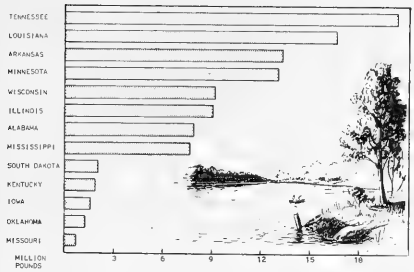
Trade Agreement Authority: H. R. 2577 (Scudder) A bill to extend the authority of the President to enter into trade agreements under section 350 of the Tariff Act of 1930, as amended, and for other purposes; to the Committee on Ways and Means.

Water Pollution: H. R. 2535 (Elliott) - A bill to encourage the prevention of water pollution by allowing amounts paid for industrial waste treatment works to be amortized at an accelerated rate for income-tax purposes; to the Committee on Ways and Means.

MISSISSIPPI RIVER FISHERIES--1950 ANNUAL SUMMARY

The first complete general canvass of the Mississippi River Fisheries in almost 20 years was conducted by the U. S. Fish and Wildlife Service for the year 1950. The last survey of these fisheries was made for the year 1931.

Landings of fishery products in the Mississippi River and its tributaries during 1950 amounted to 105,795,800 pounds, with an ex-vessel value of $10,104,129. This was an increase of 28 percent in quantity and 249 percent in value as compared with the 1931 landings. Rough fish taken from lake and stream management programs have been included. Although these fish in many cases were not taken by commercial fishermen, they were marketed through commercial channels. Rough fish made up a majority of the catch in some states. There was a marked decrease in the production of mussel shells--in 1931 over 37 million pounds were harvested, but during 1950 only 23 million pounds were reported. Increased use of cheaper synthetic buttons has probably contributed greatly to the decline of this industry.

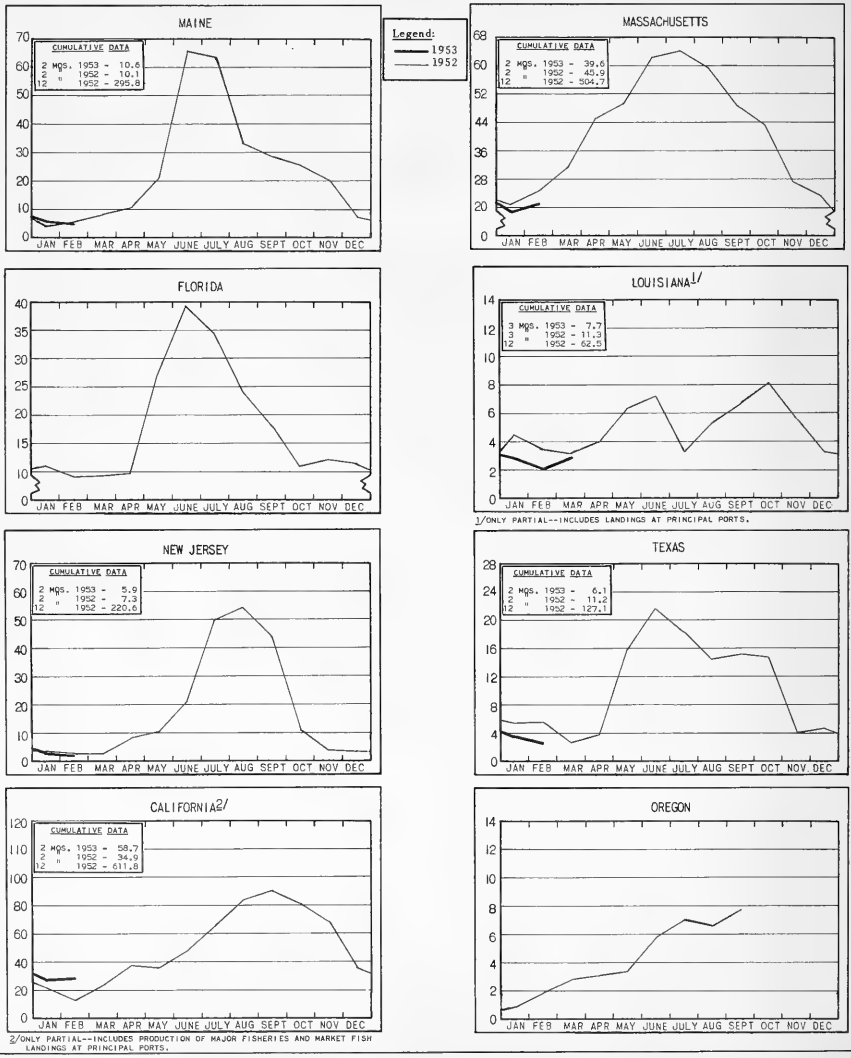


During 1950, there were 19,197 fishermen employed in these fisheries as compared with 15,884 in 1931.

--C.F.S. No. 840

CHART 1 - FISHERY LANDINGS for SELECTED STATES

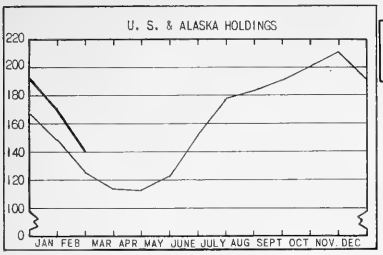
In Millions of Pounds

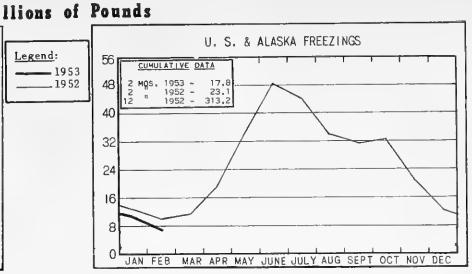


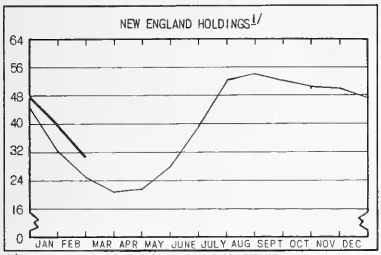
2/ONLY PARTIAL--INCLUDES PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

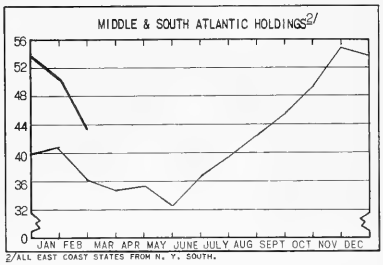
In Millions of Pounds



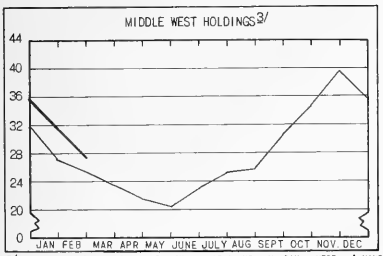




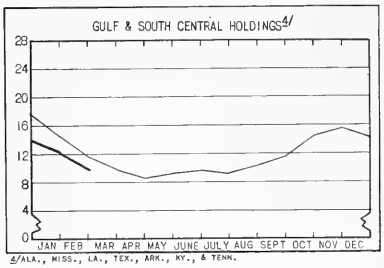
1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.



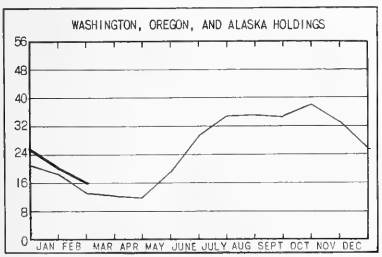
2/ALL EAST COAST STATES FROM N. Y. SOUTH.

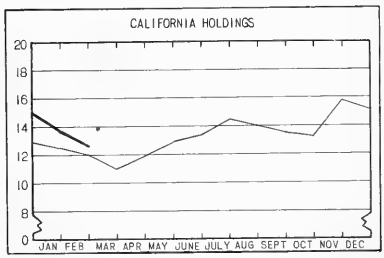


3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

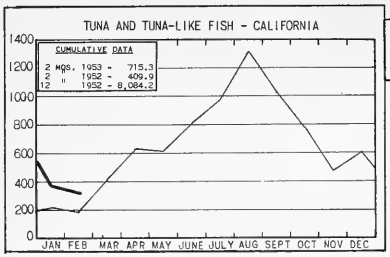


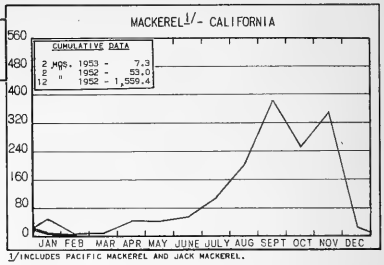


*Excludes salted, cured, and smoked products.

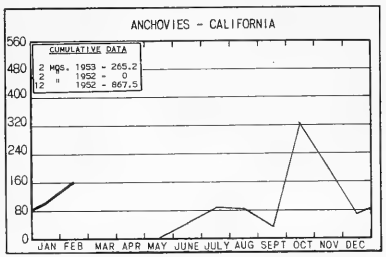
CHART 3 - CANNED PACKS of SELECTED FISHERY PRODUCTS

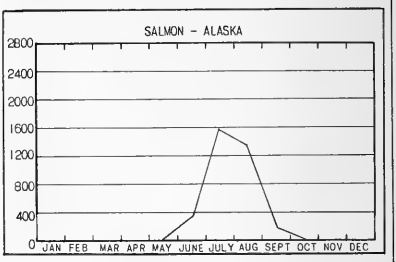
In Thousands of Standard Cases

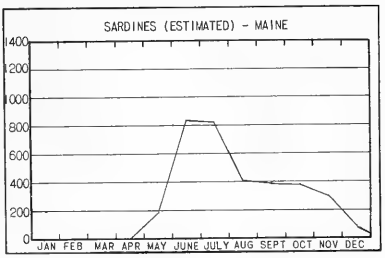




1/INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.

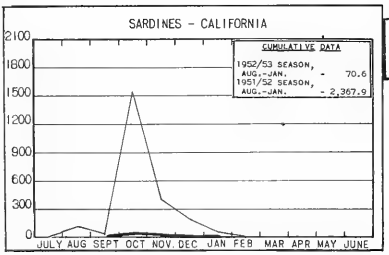






STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¼ oz.
SHRIMP	48	—	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.



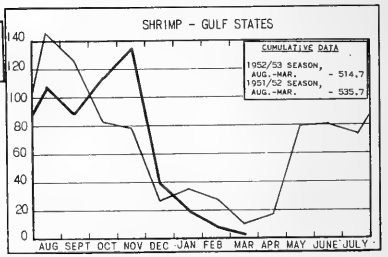
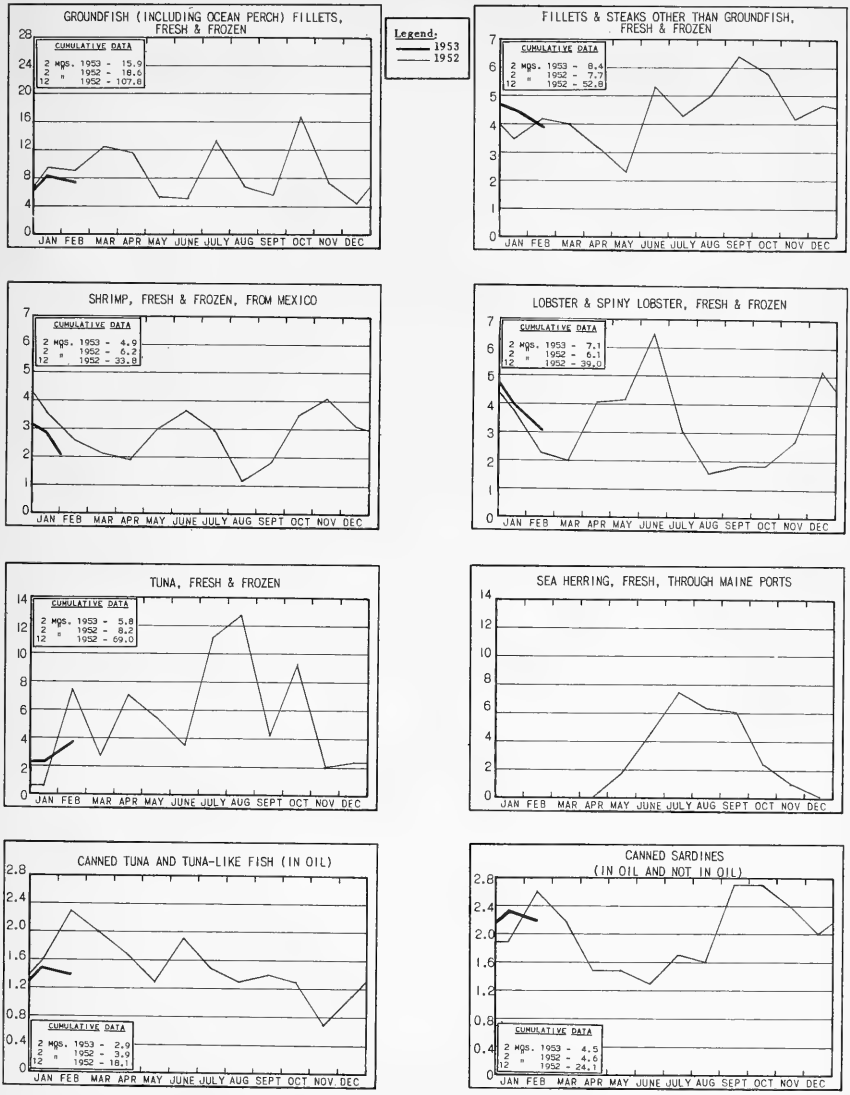
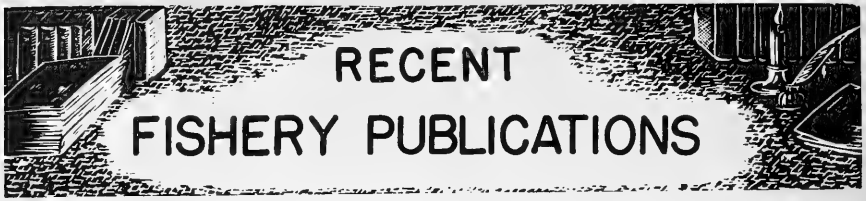


CHART 4 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





Recent publications of interest to the commercial fishing industry are listed below.

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C., TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR.-FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number Title

CFS-810 - New Jersey Landings, August 1952, 2 p.
CFS-830 - Frozen Fish Report, January 1953, 8 p.
CFS-831 - New Jersey Landings, September 1952, 2 p.
CFS-832 - New Jersey Landings, October 1952, 2 p.
CFS-833 - Manufactured Fishery Products, 1951 Annual Summary, 6 p.
CFS-834 - Massachusetts Landings, November 1952, 7 p.
CFS-836 - Florida Landings, November 1952, 6 p.
CFS-837 - Maine Landings, November 1952, 4 p.
CFS-838 - Texas Landings, December 1952, 4 p.
CFS-839 - Fish Meal and Oil, December 1952, 2 p.
CFS-840 - Mississippi River Fisheries, 1950 Annual Summary, 7 p.

SSR-Fish. No. 84 - Furunculosis of Fish, by Bruce M. McCraw, 91 p., December 1952

Number Title

Wholesale Dealers in Fishery Products (Revised):
SL-9 - Delaware, 1953, 1 p.
SL-16- Florida, 1953, 11 p.
SL-20- Texas, 1953, 4 p.

Sep. 338 - Japanese 1952 North Pacific Salmon-Fishing Expedition.

Sep. 339 - Use of Fish in New England Schools Increased by Demonstrations.

Sep. 340 - Louisiana School-Lunch Program Uses More Fish.

Sep. 341 - Experiments with a "Fish Pump."

Sep. 342 - Technical Note No. 24--A Portable Immersion Freezer.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

British Columbia Catch Statistics 1952 (By Area and Type of Gear), 131 p., illus., processed. Department of Fisheries of Canada, Pacific Area, Vancouver 5, B.C. (Limited distribution.) This is the second annual report of fish-catch statistics for British Columbia based on the multiple sales-slip system that was introduced on a Province-wide basis on January 1, 1951. Statistics are presented by species, by months, by year, and by area. The most significant effect on the volume of fish caught in British Columbia in 1952 was the decrease in the fishing effort caused by the tie-up of the fishing fleets pending price and other negotiations between the fishermen's union and the operators. There were five distinct and separate periods during 1952 when fishing activities were curtailed. The first major stoppage occurred when the whaling fleet remained tied up pending a union contract and did not leave port until May 2, nearly four weeks later than in 1951. Despite this, however, the total whale catch was the highest for many years. Whaling statistics are not reported on sales slips and are therefore not included in this summary. The second tie-up started in Prince Rupert on April 29 when most of the trawl fleet remained in port pending price negotiations and union recognition. This tie-up gradually spread to other parts of the Province and included most but not all of the trawler fleet. The

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

boats finally started returning to the fishing grounds on June 23, but production was seriously curtailed during the tie-up. During the salmon season, the gill-net and seine fleets were tied-up on two separate occasions. From July 20 to July 24, the gill-net and seine fleets remained in port pending price negotiations on pink salmon. The second tie-up of the salmon gill-net and seine fleet occurred during prolonged negotiations on the price of chum salmon. This lasted from September 6 until October 20 and, with the exception of a small number of boats fishing for the cooperatives or for food relief purposes, the tie-up of net fishermen was practically 100 percent effective. The final tie-up during the year affected the herring seine fleet. Due to the drop in the market price for fish oils since the last season, the operators initially offered a lower price per ton to the fishermen for the 1952/53 season as compared with the previous year. This was not acceptable to the fishermen and attempts made at negotiating a price satisfactory to both operators and union were not successful in the closing months of 1952.

(British Columbia) Provincial Department of Fisheries Report (with Appendices, for the Year Ended December 31, 1951), 116 p., illus., printed. Provincial Department of Fisheries, Victoria, B. C., 1952. The first section of this report is devoted to an analysis of British Columbia's 1951 production and value of fishery products, the canned salmon pack, and a review of the salmon canning industry. Also discussed are the other canning industries (pilchard, herring, tuna, and shellfish), the production of processed fish (mild-cured salmon, dry-salt salmon, dry-salt herring, and pickled herring), the halibut fishery, fish oil and meal, net fishing in non-tidal waters, value of Canadian fisheries and the standing of the provinces for 1950, species and value of fish caught in British Columbia, condition of British Columbia's salmon-spawning grounds, and the herring investigation. The second section of this report includes the following articles: "Contributions to the Life-History of the Sockeye Salmon (Paper No. 37)," by D. R. Foskett; "Results of the West Coast of Vancouver Island Herring Investigation, 1951-52," by J. C. Stevenson, A. S. Hourston, K. J. Jackson, and D. N. Outram; "The Larva of Bankia setacea Tryon," by D. B. Quayle; "Report of the International Fisheries Commission, 1951;" "Report on the Investigations of the International Pacific Salmon Fisheries Commission for 1951;" and the "Salmon-spawning Report, British Columbia, 1951." Statistical data on the British Columbia fisheries are also included.

(Canada) Fisheries Statistics of Canada, 1949 and 1950, 96 p. (tables), printed (in English and French), C$1.00. Department of Trade and Commerce, Dominion Bureau of Statistics, Ottawa, Canada, 1952. This is a review of the fishery statistics of Canada for 1949 and 1950 prepared in collaboration with Dominion and Provincial Fisheries Departments. It includes data on the quantity and value of the catch of fishery products for Canada as a whole (excluding Newfoundland); production of fish oils and fish meal; production of frozen, salted, pickled, vinegar-cured, and canned fish; shellfish production; employment in fish-processing establishments; and value of exports and imports of fishery products. The publication also contains data on the total value of the fisheries, by province, for 1948-1950; Canada's lobster pack, by province, for 1941-1950; and fishing bounties paid to vessels and boats in 1949 and 1950.

(Canada) 1949 Landings of Fresh Groundfish by Offshore Vessels at Nova Scotia Forts, by F. D. McCracken and G. Sullivan, Statistical Series No. 3, 8 p., illus., processed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N.B., February 1953. This is the third of a series of circulars which presents data for fresh groundfish landings by offshore vessels at Nova Scotia ports for 1949. Statistics of catch by species and size are recorded by months in relation to fishing method. Catch statistics for part of the offshore fleet are listed by quarters in relation to area fished. Special reference is made to ocean perch (redfish) in this circular with a graphic presentation of the long-term trend in total landings by all countries from the Nova Scotia Banks and Gulf of St. Lawrence and a graph of the more recent landings of this species from Newfoundland Banks.

Gulf States Marine Fisheries Commission Third Annual Report 1951-52 (to the Congress of the United States and to the Governors and Legislators of Alabama, Florida, Louisiana, Mississippi, and Texas), 38 p., illus., printed. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans 16, La. Contains the Commission's activities for the period October 1951-October 1952. Resumes of biological, oceanographic, and technological research by the various Gulf states and plans for future investigations are presented. Included are short discussions of the U. S. Fish and Wildlife Service activities in biological research and exploratory fishing in the Gulf area. Also describes the oceanographic survey and oyster investigations, and contains a financial report of the Commission.

Handbook on Sanitation of Vessels in Operation, PHS Publication No. 68, 48 p., illus., printed, 25 cents. Division of Sanitation, Public Health Service, Federal Security Agency, Washington, D.C., 1951. (For sale by the Superintendent of Documents, Washington 25, D. C.) This booklet describes in detail recommended sanitary measures to be taken on board vessels in interstate and international commerce. Divided into seven major sections, the recommendations cover such subjects as potable water, wash water, waste disposal, vermin control, food sanitation, and the all-important ratproofing schemes. Shipowners, seamen, health officials, and those engaged in foreign commerce, in particular, will find this booklet helpful in maintaining good sanitary conditions at sea. There is attached to the inside cover of this handbook a copy of a Public Health Service form entitled "Inspection Report--Vessel Sanitation." It is a revision of one generally used by Public Health Service representatives during inspections of vessels in operation. The sequence of the items on the form follows that in the handbook.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

Inter-American Tropical Tuna Commission Annual Report for the Years 1950 and 1951, 58 p., illus., printed, in Spanish and English. Inter-American Tropical Tuna Commission, La Jolla, Calif., 1952. The Convention between the United States of America and the Republic of Costa Rica for the establishment of an Inter-American Tropical Tuna Commission was signed on May 31, 1949. The purpose of the Convention is to establish a means of cooperation in the gathering and interpretation of factual information to facilitate maintaining, at a level which will permit maximum sustained catches, the populations of yellowfin and skipjack tuna, and other fish taken by tuna fishing vessels in the eastern Pacific Ocean. This report describes the functions and duties of the Commission and outlines the program of investigations. It includes a report of the investigations of the Inter-American Tropical Tuna Commission during the year 1951, and the text of the Convention between the United States of America and the Republic of Costa Rica for the establishment of the Commission. Also included are the enabling legislation passed by the United States Congress, giving effect to the Convention, and the Decree ratifying the Convention adopted by the Republic of Costa Rica.

NEFCO, From Sea To World Markets, by Harry R. Beard, 128 p., printed, $1.25. New England Fish Company, Seattle, Washington, 1953. Although designed primarily as a means of publicizing the products and activities of the New England Fish Company, on the occasion of its 85th anniversary, the book contains considerable valuable information on the fishing industry. There is accurate and authentic information on historical background, catching, packing, freezing, processing, packaging, and marketing of fish and shellfish (including salmon, tuna, crabs, clams, oysters, halibut, cod, rockfishes, flounders, smelt, and herring). Of particular interest are the discussions on what buyers want to know about fresh fish, frozen fish, and canned tuna; and inspecting and grading of canned salmon. General information on the nutritional value of fishery products and sources of fishery information are also valuable. Also included are an interesting history of the development of the company and its facilities, and a list of its products and how they are produced and marketed. Written in the language of the layman, the report makes interesting and informative reading for fish producers, buyers, or consumers. The photographs and illustrations are excellent and were used freely.

"The Netherlands Sea Harvest," by W. G. Pybus, article, Foreign Trade, vol. 13, no. 320 (February 14, 1953), pp. 7-9, printed, single copy 10 cents. The Department of Trade and Commerce, Ottawa, Canada. (Available from The Queen's Printer, Government Printing Bureau, Ottawa, Canada.) Describes the Netherlands fishing industry for 1952, rising costs and prices, and trade in fishery products, and includes a forecast for the fishing industry for 1953. Statistical data are also included on landings of fish in Netherlands ports for 1951 and January-September 1952, and imports (from Canada) and exports.

"The Oyster Farmers of Virginia," by James Wharton, article, The Commonwealth, January 1953, pp. 14-16, illus., printed, 25 cents per issue. Virginia State Chamber of Commerce, Richmond 19, Va. Describes Virginia's public and private oyster-growing industry. Throughout Tidewater Virginia there are oyster grounds operated by business enterprise and the so-called "public rocks" administered by State authorities. A discussion of the two different types is found in this article.

(Pacific Marine Fisheries Commission) Fifth Annual Report of the Pacific Marine Fisheries Commission for the Year 1952 (To the Congress of the United States and the Governors and Legislatures of Washington, Oregon, and California), 19 p., printed. Pacific Marine Fisheries Commission, Portland, Oregon. Describes briefly the activities of the Commission and contains a short resume of the one meeting of the Commission during 1952. Also included are summaries of reports submitted by the participating agencies on the research conducted in 1952 on the following marine species and fisheries: ocean salmon, albacore tuna, sablefish (black cod), the otter-trawl fishery, and pollution research. In addition, a financial report of the Commission appears in the report.

(Scotland) The Food of Halibut from North Atlantic Fishing Grounds, by A. D. McIntyre, Marine Research 1952 No. 3, 22 p., illus., printed, 4s. 1½d. (about 58 U.S. cents). Scottish Home Department (Available from Her Majesty's Stationery Office, Edinburgh, Scotland), 1953. Describes the food of the North Atlantic halibut, based on the examination of 1,225 stomachs, mostly from the waters around Iceland and Faroe. The halibut had been feeding mainly on fish, decapod crustacea, and cephalopoda, according to this report. A change in feeding with age, from a more or less mixed diet in the younger specimens to an almost entirely fish diet in the adults is suggested, particularly off Iceland. The feeding intensity is greater in summer than in spring. The small number of species required to support the halibut population is noted, and the importance of Sebastes marinus discussed. The feeding habits are considered and some of the factors connected with a fish taking bait are analyzed.

(Scotland) Haddock Bionomics--1. The State of the Haddock Stocks in the North Sea 1946-50 and at Faroe 1914-50, by B. B. Parrish and R. Jones, Marine Research 1952 No. 4, 27 p., illus., printed, 5s. 1½d. (about 72 U.S. cents). Scottish Home Department (Available from Her Majesty's Stationery Office, Edinburgh, Scotland), 1953. The first in a series entitled "Haddock Bionomics," this publication is an attempt to apply theoretical models to fish population problems developed on precise concepts of "overfishing," "maximum yield," and "maximum fishing intensity," earlier formulated. To the authors, the concept of "maximum fishing intensity" is the most important element in biological overfishing, and can be defined as "...that fishing intensity which, when operative in a given area, on a self-contained fish stock over a number of years during which recruitment has been relatively steady, would give the maximum sustained yield from that area. When the fishing intensity increases above that level which gives rise to the maximum sustained yield from the gear in use then the stock is, on this definition, being 'overfished'."

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The authors conclude, "The particular merits of this definition are (1) that it is independent of political or economic factors, which determine the profitableness of fishing to the individual fishermen and which may fluctuate widely from year to year, and (2) that the maximum yield can be determined from population data and is characteristic of each self-contained fish stock subject to commercial exploitation. Necessarily, it depends upon the method or methods of fishing." This study is the result of the assessment of the haddock stocks on the Faroe Plateau and in the North Sea since 1914 and 1946, respectively, by the use of mathematical models to determine the present level of yield in relation to the maximum yield, based on the biological concepts which are more reliable than the interpretation of commercial statistics alone.

Seasonal and Vertical Patterns of Oyster Setting off Wadmalaw Island, S. C., by J. Kneeland McNulty, Contributions from Bears Bluff Laboratories No. 15, 19 p., illus., printed. Bears Bluff Laboratories, Wadmalaw Island, S. C., January 1953. Describes seasonal and vertical patterns of oyster setting as estimated from semimonthly spat counts of cultch exposed at various vertical elevations during two setting seasons at three stations near Bears Bluff Laboratories, Wadmalaw Island. Spatfall in excess of one percent of the seasonal total can be expected from early May through early October, subject to annual variations of about two weeks. Two setting pulses can be expected each season, the first from early June through early July and the second, of lesser intensity, some time in August or early September, with setting of considerable intensity occurring before, between, and after these maxima. A vertical difference of about 2 feet has been detected in the zone of maximum setting at 2 stations, about 2.8 and 8.3 nautical miles distant from the sea. As measured from mean low tide level, maximum setting occurred at about minus 1 foot at the more seaward station and at about plus 1 foot at the other station. Setting below low-water mark to a depth of 7 feet was continuous from about July 1 until about September 15, 1952, at the station investigated. Spatfall intensity at minus 3, 5, and 7 feet averaged about 1.5 times less than intensity at minus 1 foot and about 4 times less than at plus 1 foot. Rapid fouling of clean cultch below low-water mark with bryozoa and silt is suggested as a major factor in reduced setting below low-water mark.

Years of Progress 1945-1952 (U. S. Department of the Interior), 197 p., illus., printed, $1.25 (paper). (For sale by the Superintendent of Documents, Washington 25, D. C.) This publication reports on the progress in the utilization and conservation of our natural resources and the contributions of the various agencies (including the Fish and Wildlife Service and the Defense Fisheries Administration) of the Department of the Interior during the period 1945-52. It is divided into major sections by major resources--(1) Water and Power, (2) Mineral Resources, and (3) The Land of America. The latter section includes, among others, a report of the Fish and Wildlife Service with specific discussions on utilization of fishery resources (including a description of the contributions of the Branch of Commercial Fisheries); disaster caused by the sea lamprey in the Great Lakes fisheries; Alaska fisheries administration; maintenance of inland fisheries; aid to the states in fish and wildlife conservation, river basin studies, protection of wildlife resources; and other activities. Other major sections of this publication are (1) The Defense Agencies of the Department, (2) Departmental Management, (3) Foreign and International Affairs, and (4) The Controversy Over the Continental Shelf. The first of these sections includes a description of the Defense Fisheries Administration's progress since its establishment in 1950.

WHAT DO CONSUMERS LIKE ABOUT FROZEN FISH?

"Ease of preparation" is the most liked feature of frozen fish. This was brought out in the recently published results of a national consumer survey (Fish and Shellfish Preferences of Household Consumers) made by the U. S. Fish and Wildlife Service during 1951. It was mentioned by nearly half (42 percent) of those asked: "What do you particularly like about frozen fish?"

"Taste" ranked second in importance, with 23 percent saying that they particularly liked frozen fish for this reason. The "price" of frozen fish surprisingly ranked far below many other features, with only 3 percent mentioning it. "Ease of storing" frozen fish in the refrigerator (cited by 12 percent of the respondents) was third in importance. "Ready availability" (liked by 6½ percent), "lack of bones" (6 percent), and its "addition of variety" to the diet (5½ percent) were all advantages of frozen fish more frequently mentioned than its economy.

Analysis of the replies by geographic areas of the country (Northeast, North Central, South, and West) gave quite similar rankings to the main reasons for frozen fish being liked. "Ease of preparation" and "taste" ranked one and two, respectively, in all areas. "Ease of storage" was third everywhere except in the South, where it dropped to fourth place with "easy availability" third.

The fourth ranking virtue of frozen fish in both the Northeast and West was considered to be the "variety" which it could add to the diet. However, in the North Central area people considered the "absence of bones" as being fourth in importance.

Part I--National Summary (FL-407) and Part II--Regional Summary (FL-408) of the series Fish and Shellfish Preferences of Household Consumers--1951 are available free upon request from the Division of Information, U.S. Fish and Wildlife Service, Washington 25, D. C.

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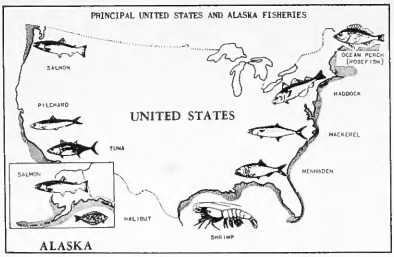
FISHERIES OF THE UNITED STATES AND ALASKA, 1950

Fisheries of the United States and Alaska, 1950, C.F.S. No. 841, is a general review of the 1950 survey covering the catch of fishery products in the United States and Alaska. This is the first survey of the fisheries of the United States since 1931 to include all areas. The tables in this report include a summary of the number of fishermen and operating units by area; catch by species by area; catch by states; and catch by gear.



Catch of the Fisheries of the United States and Alaska, 1946-50 1/

Year	Quantity	Ex-vessel Value	Average Price
	Lbs.	$	¢ per Lb.
1950	4,884,909,000	343,876,000	7.04
1949	4,796,000,000	339,000,000	7.06
1948	4,575,000,000	367,000,000	8.02
1947	4,344,000,000	307,600,000	7.08
1946	4,456,000,000	310,000,000	6.96

1/ CATCH DATA FOR YEARS 1946-49 INCLUDE ESTIMATES FOR SOME REGIONS NOT SURVEYED.

The 1950 catch of fishery products in all sections of the United States and Alaska totaled 4,884,909,000 pounds, with an ex-vessel value of $343,876,000. This was an increase of 2 percent in quantity and 1 percent in value as compared with the estimated figures for 1949.

Copies of C.F.S. No. 841 are available free upon request from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.