



TRENDS AND DEVELOPMENTS

Alaska

FISH AND GAME BOARD SETS POLICY: The newly-created Alaska Board of Fish and Game has endorsed the Governor's policy decisions relating to the fisheries resources of Alaska, made prior to the creation of that Board, the Board Chairman announced May 7, 1959.

"The Board is pleased with the stand taken by the Governor on fish and game policy, made by him during the interim period prior to the convening of this Board. We are in complete harmony with the previous action," the Chairman said.

The Chairman and the Board also indicated approval of the selection of Clarence L. Anderson to head the new department. He was selected from a list of seven candidates submitted to Governor Egan by the Board.

"We believe that the first state legislature in the enactment of legislation covering the Department of Fish and Game (Chapter 94, SLA 1959) has created a workable and commendable act. We are in complete harmony and intend to assume the responsibility placed upon the Board by the fish and game legislation," the Chairman continued.

The Board, which convened May 5, has already adopted bylaws governing the meetings of the Board, elected a chairman, made recommendations for a Commissioner to head the department, and met the special legal counsel to the Governor on fisheries. Governor Egan and his counsel outlined the policies adopted by the Governor previous to the activation of the Board, and fisheries counsel briefed the Board on litigation now in progress over fish traps.

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FISH AND GAME BOARD PREPARES FOR STATE CONTROL: The Alaska Board of Fish and Game adjourned on May 11, 1959, after providing for immediate assumption of State fish and game control, should Federal authority be successfully challenged in the courts.

The Board laid the groundwork for State control by declaring that an emergency now exists with regard to the question of jurisdiction over fish and game in Alaska. The Board also declared the constitutionality of the Westland amendment to the statehood act is seriously questioned, with the public well aware of it and that, further, this constitutional question raises doubt as to the legality of Federal control of Alaska fish and game.

In a series of resolutions the Board further declared that should Federal control be successfully challenged, a possible enforcement hiatus could encourage violations of the existing laws and regulations.

For the foregoing reasons the Board found it necessary to prepare to assume, at a moment's notice, state control of fish and game.

Therefore the Board prepared, by resolution, to confirm at a moment's notice a full complement of rules and regulations to govern the fishing industry of Alaska by the state agency.

In conformity with Article 4 of the Administrative Procedures Act of 1959, the Board having found that an emergency exists, as above outlined, it ordered the commercial fishery regulations of May 8, 1959, and the sport fish and game regulations of May 8, 1959, under study by the Board since it first met, to be properly identified. The rough draft material accordingly was ordered placed in special folders and signed by the Board and Commissioner as to identity.

The Commissioner was instructed to prepare from the rough drafts a set of clear copies of the regulations to be sent to all members of the Board as soon as possible.

The Commissioner, in event of emergency, has been directed to poll the Board by telegram, telephone, or the quickest means of communication possible, on the following:

- a. Do the facts as outlined constitute an emergency.
- b. Does an emergency now exist?
- c. Do you now wish to adopt the regulations of May 8, 1959?

The Board will answer by return mail.

The proposed regulations largely conform to existing Federal regulations, except where the State Constitution or legislative acts dictate otherwise.

By this means, the Board feels the general public will be appraised of the fact that State jurisdiction will immediately be assumed should Federal control be successfully challenged, with State rules and regulations largely conforming to the Federal acts now governing. Therefore, the possibility of profit by gambling on the question of lack of Federal jurisdiction will be eliminated, the Board feels.

The Board also reconstituted the old local advisory committees which existed under Territorial status, with the proviso that additional committees be appointed to represent areas now without such bodies. Fourteen committees existed under the old department.

"In the past these advisory committees have done a marvelous job of keeping a finger on the pulse of public opinion and generally providing a necessary liaison between the governing bodies and the general public," the Chairman of the Board said.

Guide regulations to be promulgated by the Department were discussed but final action deferred until the October meeting of the Board in order that public opinion could be heard on the matter.

"The Board welcomes any suggestions interested parties may have on these regulations. Preferably such suggestions should be in writing, in order that full and careful study can be made by all members of the Board," said the Chairman.

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California

CRAB AND SHRIMP STUDIED OFF CENTRAL CALIFORNIA COAST (M/V N. B. Scofield Cruise 59-S-2): The Central California coastal waters from the vicinity of Salt Point, Sonoma County, south to Pescadero Point, San Mateo County were surveyed (March 8-April 1, 1959) by the California Department of Fish and Game research vessel N. B. Scofield. The purpose was to conduct crab-trap savings-gear tests by comparing the catches of traps equipped with one 4-inch, two 4-inch, two 4½-inch, and two 4½-inch circular escape ports. These tests were designed to determine the optimum size and arrangement of escape ports for maximum retention of legal males and maximum escapement of sublegal male and female crabs. Other objectives were: (1) to investigate the distribution and relative abundance of juvenile crabs; and (2) to investigate the distribution, size, and sex of shrimp in the Bodega Bay area through exploratory beam trawling.

Crab Escape-Port Tests: Comparison fishing trials were conducted in commercially-productive crab areas, using equal numbers of traps equipped with the four different escape-port arrangements. A total of 224 individual trap sets was made at 4 locations.

Distribution and Relative Abundance of Juvenile Crabs: Dungeness crabs were taken in 20 of 61 tows using a 10-foot beam trawl with 1- to 1½-inch mesh nets. Trawling with commercial size otter-trawl gear with a 4½-inch mesh net and a 2-inch mesh cod end resulted in crab catches at 13 of 16 locations. Catches of juveniles were low for both types of gear and areas of abundance were not located with trawl methods.

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PELAGIC FISH AND BARRACUDA STUDIED OFF BAJA CALIFORNIA COAST (M/V Alaska Cruise 59-A-2): The coastal waters off central Baja California, Mexico, from Ballenas Bay northward to San Quentin Bay were surveyed (February 27-March 18, 1959) by the California Department of Fish and Game research vessel Alaska to sample the spring spawning population of sardines. Other objectives were: (1) to sample young sardines from the August-September spawning period off central Baja California; (2) to collect live sardines for genetic studies conducted by the U. S. Fish and Wildlife Service, La Jolla; (3) to sample sardine, Pacific mackerel, jack mackerel, and anchovies for determining their distribution and relative abundance; (4) to troll for surface feeding species of fish; and (5) to develop barracuda tagging techniques prior to the 1959 sportfishing season by catching and tagging whenever possible and observing mortality and tag retention in the live-bait wells.

Seventy-six night-light stations were occupied. At each station fish were attracted by three 750-watt and one 1,500-watt night lights. The lights were placed on both sides of the vessel. After an hour of illumination the 750-watt lights were extinguished the 1,500-watt light was dimmed, and the Bevington blanket net was set. At times, snag

Catches of sublegal male crabs at the trap sites were uniformly low with the exception of the station southeast of Pt. Reyes. The catch of sub-legals was 7.3 per trap at this station. The average catch of sublegal males was 2.4 per trap for all trap sites.

Shrimp: A total of 45 tows were made both on and off the known shrimp beds in an effort to locate shrimp concentrations. These shrimp drags were in the area from Salt Point to Point Reyes. Drags ranged in depth from 20 to 198 fathoms, with the majority in normal shrimp producing depths of 30 to 70 fathoms. No concentrations of shrimp were located although small quantities were taken in 28 of the 55 drags.

The lack of shrimp concentrations in this area at this time of year is not unique. A similar condition was noted in February and March 1957. However, the 1957 season was successful, indicating that though there is a lack of shrimp in the area early in the year, concentrations can appear later.

Carapace measurements were made and stages of sexual development were observed--51 percent of the shrimp were males, 41 percent were females, and 8 percent were transitional between males and females; 29 percent of the females were carrying eggs.

Measurements indicated an average size of 18.8 mm. for males, with modes at 13 and 19 mm. The average size of transitionals was 20.0 mm. and the average size of the females was 21.2 mm.

gangs and lures were used to catch fish, particularly when they were wild and tended to avoid the net.

Sardines were sampled at 10 stations, northern anchovies at 10, Pacific mackerel at 6, and jack mackerel at 5. A total of 487 miles was scouted at night between stations, and 22 sardine, 61 anchovy, 2 Pacific mackerel, and 25 unidentified schools were observed.



Fig. 1 - California Department of Fish Game's research vessel M/V Alaska.

Sardines were sampled and observed most frequently in the Sebastian Vizcaino Bay area between Pt. San Eugenio and Santa Rosalia Bay. Somelarge schools (up to 90 tons) were seen in this area. A large concentration of anchovy schools was present along the east side of Cedros Island.

Sardines were difficult to sample because of their erratic behavior beneath the light. Only two

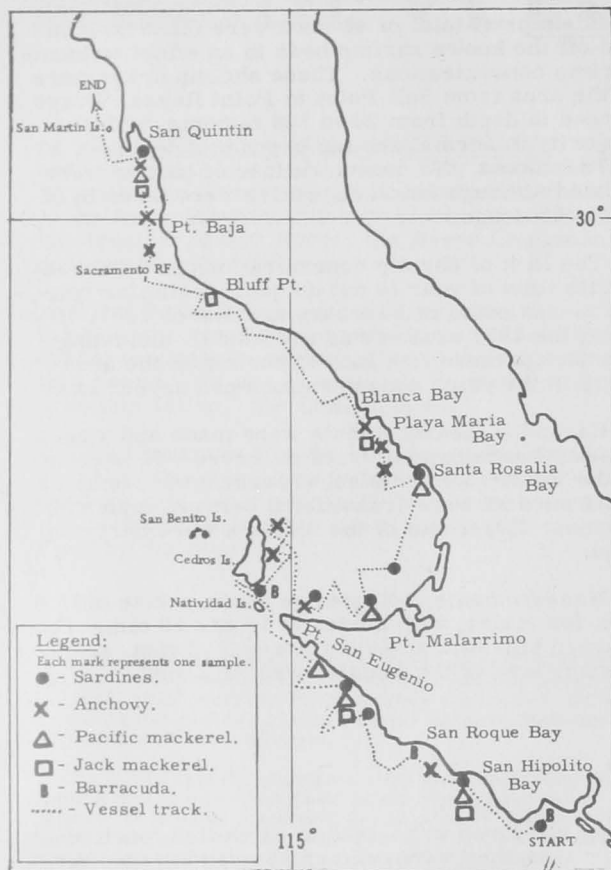


Fig. 2 - M/V Alaska Cruise 59-A-2 (February 27-March 18, 1959).

blanket net sets produced 50 or more fish. Many schools remained deep with a few individuals darting to the surface. Schools of this type sounded immediately, when the blanket net touched the water.

Almost all sardines examined had enlarged gonads indicating close proximity to spawning. Lengths of sardines ranged from 120 mm. to 204 mm. with modes at approximately 135 mm. and 165 mm. Larval and post-larval fish were taken at two stations near Cedros Island.

Sea surface temperatures ranged from 14.1° C. (57.4° F.) off Pt. Canoas to 18.4° C. (65.1° F.) in Ballenas Bay. Aside from these extremes, water temperatures were quite uniform, ranging from 16° C. to 17° C. (60.8° F. to 62.6° F.). In general temperatures were nearly 1° C. cooler than encountered during the same time in 1958.

Ninety-three barracuda, caught at three different locations, were tagged and placed in the vessel's bait wells. On March 2, 25 fish caught in Ballenas Bay were tagged alternately with spaghetti-loop tags (13) and tuna dart tags (12). Twenty-one caught off Asuncion Island on March 5 were tagged in the same manner (10 loop and 11 dart). Off Cedros Island on March 8, 47 were tagged (22 with a toggle-type, 21 with darts and 4 with loop tags). The 93 fish ranged in length from 21 to 30 inches.

All the fish were caught with small barbless feather lures. While being tagged, they were held to prevent movement. The dart and toggle tags were placed above the lateral line between the two dorsal fins. The loop tags were inserted slightly posterior to the second dorsal fin.

Only four fish (4.3 percent) died during the cruise. Three of the 44 fish containing dart tags and one of 27 with loop tags succumbed.

A decrease in the abundance of giant kelp (*Macrocystis*) from the previous summer was noted. Kelp beds off Asuncion Island and the mouth of Turtle Bay had nearly disappeared. Other beds were less dense than usual.

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AERIAL CENSUS OF COMMERCIAL FISHING CONTINUED: Airplane Spotting Flight 59-4: The inshore area from the Mexican border to the Oregon border was surveyed from the air (March 23-26, 1959) by the California Department of Fish and Game Cessna 170 (1359D) to determine the distribution and abundance of pelagic fish schools.

Although weather conditions were not ideal, some coverage of the entire California coast was possible during the four days devoted to the survey. Visibility north of San Simeon ranged from fair to poor, while atmospheric conditions south of San Simeon were fair to excellent. Strong winds, broken clouds, rain, and low overcast were encountered along the central and north coasts.

Only a few pelagic fish schools were in evidence. No schools were seen north of Morro Bay and only three small unidentified schools were observed south of Newport Beach.

Eighty anchovy schools were present in Estero Bay, between Morro Rock and Estero Point from 1 to 3 miles offshore. All were medium to large in size and were compact and dense in appearance. Sixteen similar anchovy schools were present in the area between Morro Bay and Pt. Arguello and 16 more schools were seen near Santa Barbara.

From 1 to 2 miles offshore between the Santa Monica breakwater and the Malibu pier, 71 anchovy schools were counted. Like those at Morro Bay, they were dense and well defined.

Twenty-nine small, scattered schools of anchovies were observed south of Santa Monica Bay, 4 off Huntington Beach and 25 off Newport Beach.

Generally, dirty water prevailed along the coast, ranging from turbid grey-green and brown to a typical red-tide condition. In Los Angeles-Long Beach Harbor it was red-brown in appearance and

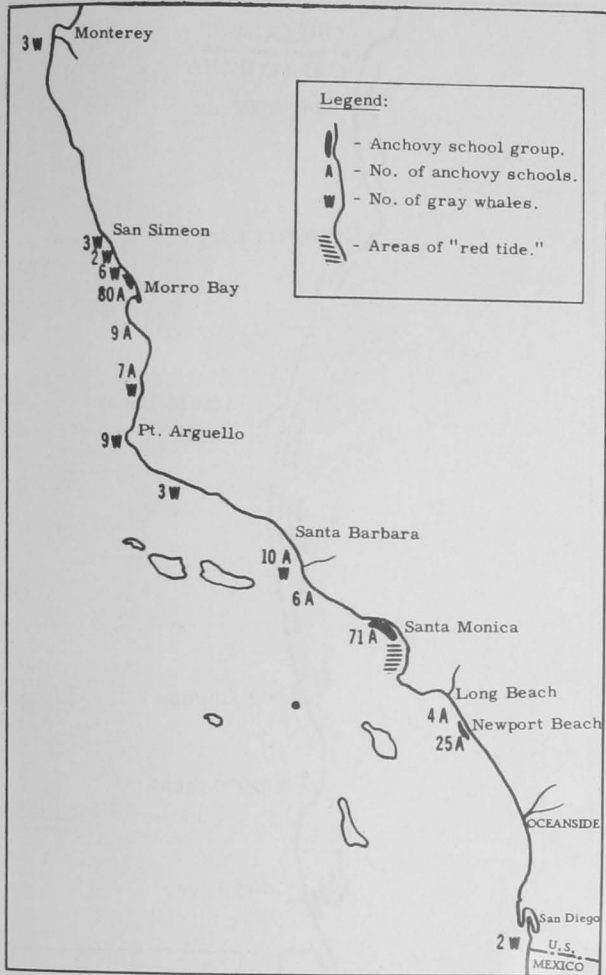


Fig. 1 - Airplane Spotting Flight 59-4 (March 23-26, 1959).

dirty brown water was present from Pt. Fermin to Redondo Beach. An outbreak of red tide was observed between Redondo Beach and El Segundo. It consisted of several "tomato-red" streaks running from shore to about one mile offshore. During the week of the survey, Marineland of the Pacific reported concentrations of 10 million dinoflagellates (40 percent *Noctiluca* sp.) per liter of water in the Palos Verdes Peninsula area.

A total of 44 northbound gray whales was seen; 5 were actively feeding on 7 small "swarms" of euphasiids one-half mile off the town of Mendocino.

Airplane Spotting Flight 59-5: The survey to determine the distribution and abundance of pelagic fish schools was continued (April 13-16, 1959) by the Department's *Cessna 170* along the inshore area from the Mexican border to the Russian River.

Poor visibility again hindered observations north of Los Angeles Harbor, but conditions were excellent during the day spent scouting south of there.

Only 24 schools were sighted north of Point Conception; 18 were sardines and were observed off Lucia (between Piedras Blancas and Pt. Sur). All were large, well defined spots. Six medium-size anchovy schools were present just outside Morro Rock.

What appeared to be a large concentration of sardines was noted between Point Conception and a point a few miles north of Goleta, extending one to four miles offshore. Schools within this group were deep and varied in size. Some were small spots, but the majority were quite large and dense. Positive identification was difficult, but these schools were in clear blue water and behaved in a manner typical of sardines.

Three small school groups of anchovies were observed between Goleta and Point Mugu. Each was within one mile of shore and was composed of a thin, stringy, almost continuous mass of fish. In the case of the group seen off of Ventura, an approximate count of the number of schools was impossible.

Los Angeles-Long Beach Harbor contained 153 anchovy schools, the majority at the San Pedro end of the harbor.

A large concentration of anchovies was present between Seal Beach and Newport Beach. These fish were noted in the surf line and offshore to about one mile. The water in the area was dirty green-brown in color.

Eleven scattered sardine schools were seen between Newport Beach and La Jolla.

Forty-one anchovy schools and three schools of yellowtail were counted between Mission Bay and Point Loma.

Thirty-one anchovy schools were observed close to shore along the Coronado Strand.

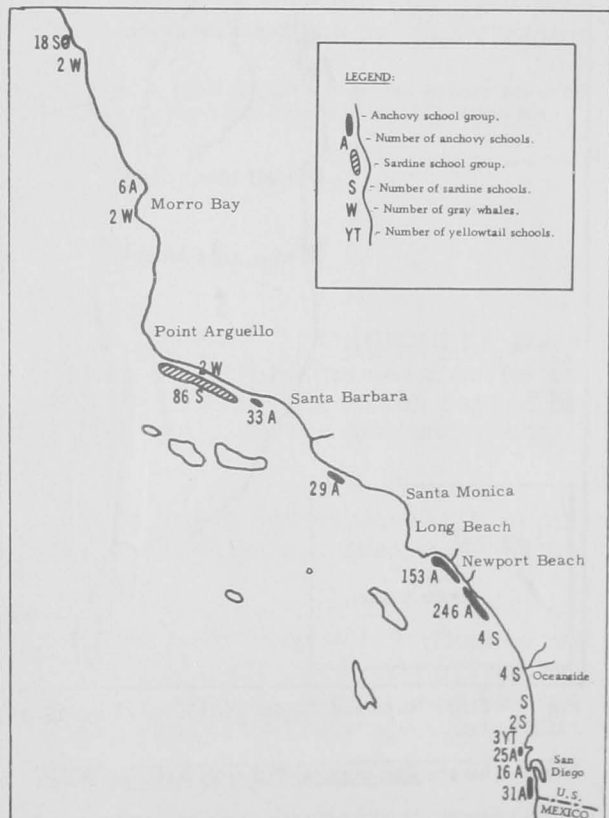


Fig. 2 - Airplane Spotting Flight 59-5 (April 13-16, 1959).

Only six gray whales were sighted during this flight. A female and calf were resting at the surface in a kelp bed about one-quarter mile offshore near Gaviota.

The water in the inshore area of Santa Monica Bay was again quite dirty, but no intense outbreak of red tide was observed.

Airplane Spotting Flight 59-6: The coastal waters from Monterey to the California-Oregon border were surveyed from the air (April 15-16, 1959) by the Department's Cessna 180 to determine fishing localities and relative fishing intensity of the northern California crab fleet.

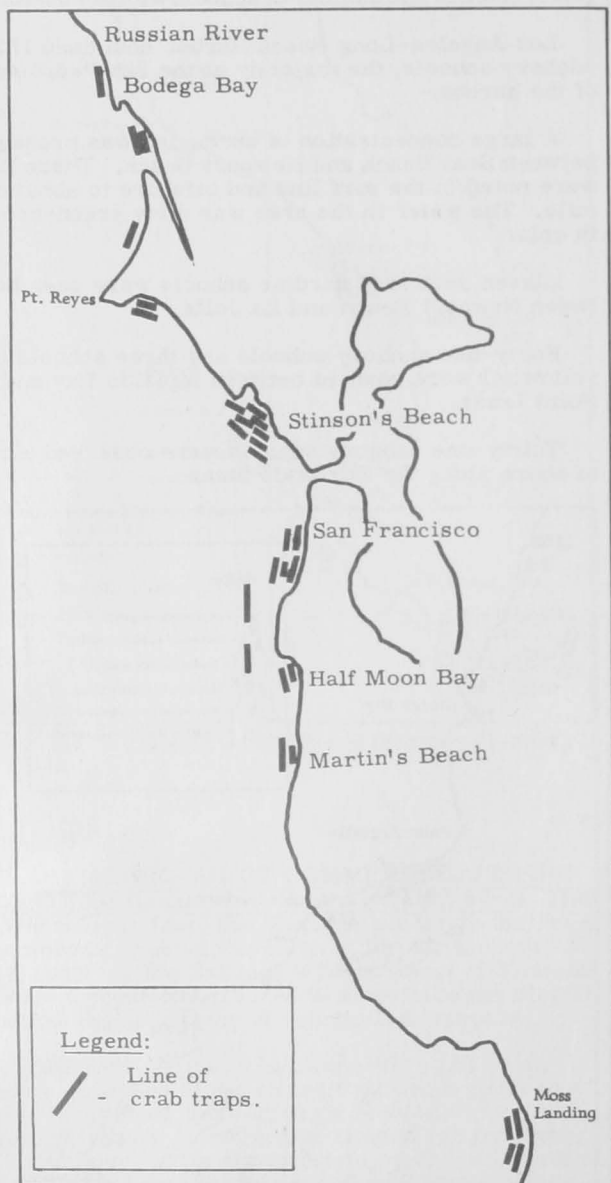


Fig. 3 - Flight Report of Cessna 180 (59-6--April 15-16, 1959).

Note: Also see Commercial Fisheries Review, March 1959, p. 26; and June 1959, p. 28.

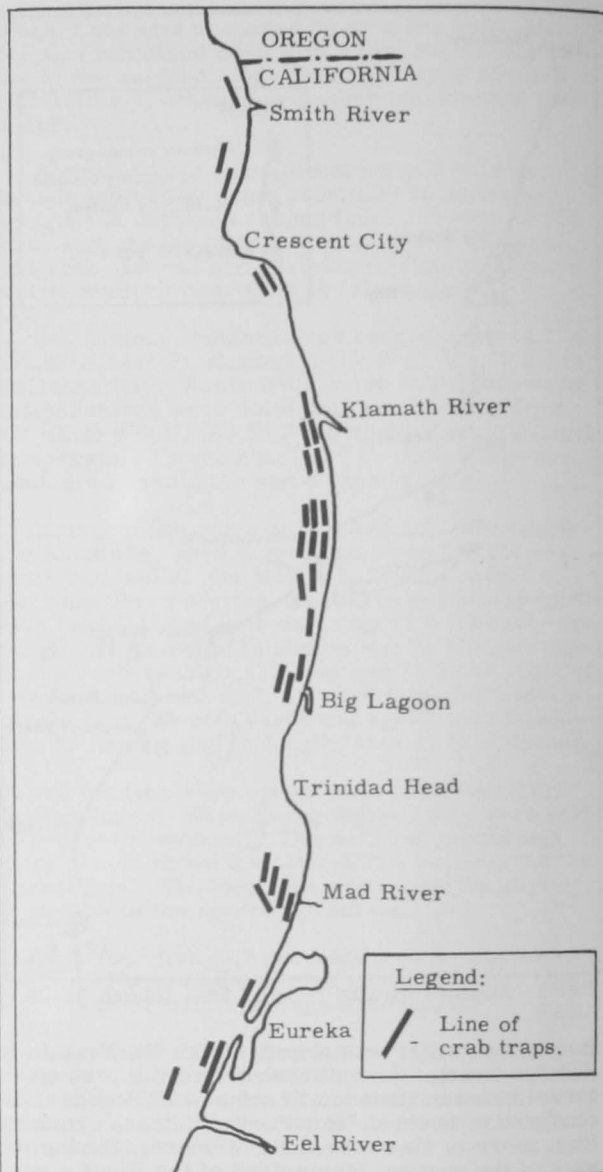


Fig. 4 - Flight Report of Cessna 180 (59-6--April 15-16, 1959).

Strong northwest winds and heavy seas hampered observations of crab trap buoys in the survey area north of the Golden Gate. Adverse flying conditions forced the abandonment of observations in the area between the Eel River and Point Arena.

Thirty-four trap lines were sighted in the area between the Eel River and the Oregon border, the majority in shallow depths. Concentrations of gear were found between the Klamath River and Big Lagoon.

Twenty-nine lines of crab gear were observed between the Russian River and Martin's Beach, with the greatest concentration off Stinson's Beach in shallow to moderate depths. Four lines were seen in Monterey Bay off Moss Landing.



Canned Fish

SHIPPING METHODS STUDY: A survey of canned fish distribution in the United States for the period July 1-December 31, 1958, has been made by the Bureau of the Census of the U. S. Department of Commerce. Arrangements have been made by the U. S. Bureau of Commercial Fisheries to obtain information on transportation aspects, or shipping methods used to ship those products.

The Bureau is financing an analysis of the data obtained, so as to provide information on the average length of haul, freight rates, and volume shipped to the various rail freight-rate territories of canned tuna, salmon, and sardines. Separate tabulations will be made for each one of those canned fishery products. A supplementary tabulation will show percentage distribution of the number of shipments by size of sales invoice and by type of carrier for all the larger packers canning each one of those products. The study is expected to be completed late in the summer of 1959. Subsequently an analysis for the first six months of 1959 may be undertaken.



Cans--Shipments for Fishery Products, January-March 1959



Total shipments of metal cans during January-March 1959 amounted to 19,450 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 23,189 tons in the same period a year ago. Canning of fishery products in January-March this year was confined largely to tuna and Gulf oysters. The decline in the shipment of metal cans during January-March this year as compared with the same period in 1958 may be due to lighter advance orders for cans for the 1959 salmon canning season.

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.



Clams

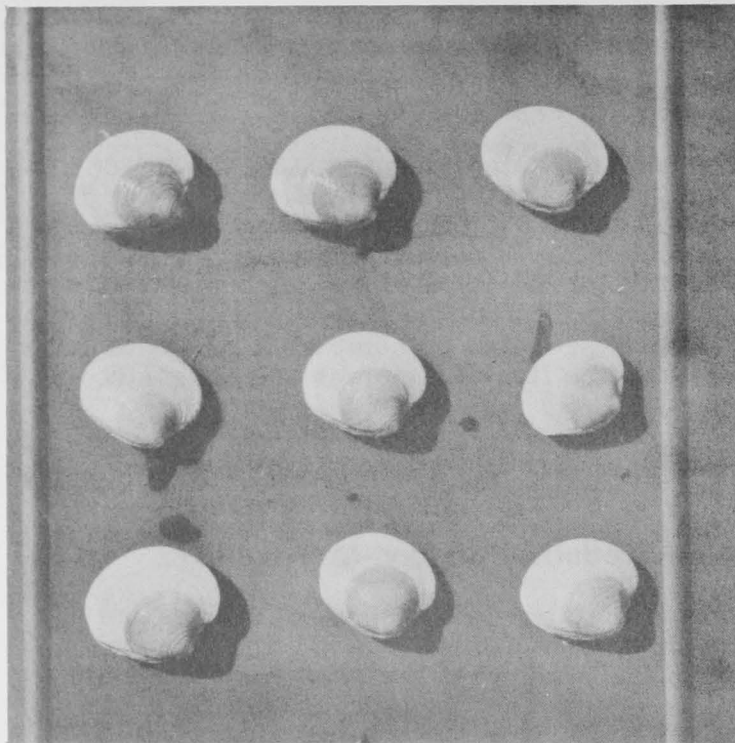
STUDIES DEVELOP SOURCE OF SEED AND PLANTING TECHNIQUES: Days of plenty for the people of two continents who like hard-shell clams seem to be in the making. Two developments are climaxing years of hard work on the part of biologists of the U. S. Bureau of Commercial Fisheries, the Bureau announced on April 30.

One is that a source of "seed" has been proved and can be developed. The other is proof that "seed" can be planted under conditions which will assure clams of the littleneck or cherrystone size a year after spawning.

The story in brief is a victory over the numerous predators which attacked the clam at every cycle of development. The big problem in hard-shell clam propagation has been getting the seed. Oyster set could be secured in many places but not so with hard-shell clams. The clam fishery was dependent entirely upon natural sequences, many of which were not so good.

Eight years ago, scientists at the Bureau of Commercial Fisheries' shellfish laboratory at Milford, Conn., began work on producing clam "seed" from parent

clams held in the laboratory. That task has been successfully completed and a technique for captive culture has been devised. The laboratory-spawned clams have been planted in predator-protected areas and have thrived.



New England seed of the hard clam, *Mercenaria mercenaria*, transplanted to Florida grew new shell (white portion) during January-March 1959.

The result is that the Milford laboratory has shipped upwards to a million of these tiny creatures to various parts of the Atlantic coast to investigate their rates of growth and survival under widely different environmental conditions.

Clams--one-sixteenth of an inch long--which the Milford laboratory shipped to Florida State University for planting in warm Gulf waters under predator-free conditions developed into 2.5-inch restaurant-size specimens in just a year. In colder areas it takes as long as 3 or 4 years for clams to make that growth.

The laboratory also has just recently shipped 150,000 small hatchery-bred clams to England and France for a new start in the clam fisheries in those countries.

Thus the long hours at the laboratories have not only shown the clam industry how to produce seed clams necessary for a stable fishery but have made it possible for the producer to put his plantings in areas which can be protected from predators.

Other research by the Bureau is perfecting control methods for clam predators and improving "fences" or barriers used to keep the predators away from the clam beds. Still another study is probing the effect of silting and other water conditions upon this important shellfish.

Note: Also see Commercial Fisheries Review, June (1959), p. 33.



Crabs

GREEN CRABS CONTROLLED WITH CHEMICAL: To control the green crabs which destroy clams, the Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor is using lindane. Samples of green crabs taken in February 1959 from burrows in creek banks near Wells, Me., support previous observations that the lindane barrier was effective during the past summer months. After digging in many places along the banks within the protected area, the biologists found only five small crabs while one five-foot section of a creek outside the barrier area contained about 200 crabs of all size classes.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1959: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.2 million pounds

(value \$1.0 million) of fresh and frozen fishery products were purchased in April 1959 by the Military Subsistence Market Centers. This exceeded the quantity purchased in March by 8.2 percent, but was 2.0 percent under the amount purchased in April 1958.

The value of the purchases in April 1959 was lower by 16.7 percent as compared with March and 17.5 percent less than for April 1958.

During the first four months of 1959 purchases totaled 7.1 million pounds (valued at \$3.8 million)--a decrease of 1.6 percent in quantity and 8.7 percent in value as compared with the similar period in 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in April 1959 averaged 44.9 cents a pound, about 13.4 cents less than the 58.3 cents paid in March and 8.4 cents less than the 53.3 cents paid during April 1958.

The lower average price for purchases this April was due to a sharp drop in fillet prices and smaller purchases of shrimp and oysters.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, April 1959 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1959	1958	1959	1958	1959	1958	1959	1958
..... (1,000 Lbs.) (\$1,000)			
2,188	2,232	7,137	7,256	982	1,190	3,782	4,142

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, April 1959 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1959	1958	1959	1958	1959	1958	1959	1958
..... (1,000 Lbs.) (\$1,000)				
Tuna	539	543	1,408	955	271	264	658	482
Salmon	-	86	-	1,327	-	51	-	724
Sardine	15	9	280	33	6	4	46	12

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during April this year. In the first four months of 1958, purchases of canned tuna were up 47.4 percent and can-

ned sardines were up eightfold as compared with the same period in 1958. No canned salmon was purchased during January-April 1959 as compared to 1.3 million pounds in the same months of 1958.

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



Great Lakes Fishery Investigations

PROGRAM OF THE RESEARCH VESSEL "CISCO" FOR 1959: During 1959 the U. S. Bureau of Commercial Fisheries research vessel Cisco will operate along the south side of Lake Superior, east of the Keweenaw Peninsula. Primary objectives will be to determine the abundance, composition, and distribution of the fish stocks, with emphasis on lake trout and chubs.

Much of the life-history and population studies of lake trout conducted in 1953 by the Cisco will be repeated this year to determine what changes have taken place during the past 6 years of severe sea-



Cisco, research vessel of the Service's Great Lakes Fisheries Investigations.

lamprey infestation. Major attention will be given the younger lake trout since information on them is least available from the commercial fishery. The small trout will be sampled with trawls and small-mesh gill nets. The abundance and distribution of spawning lake trout will be studied, when large-mesh gill nets will be set over known spawning grounds. All spawning trout and some smaller



SEA LAMPREY FEEDING ON A TROUT.

trout will be tagged and released. The lake trout data collected by the *Cisco* should add materially to the information gathered by other means so that a good idea of the present lake trout stocks and of the contribution of the hatchery-reared trout can be obtained.

Collections of trout and of other species will be made with gill nets set systematically in various areas. Sets will be mostly at 15, 25, 50, 75, and 100 fathoms, and the nets will contain the following mesh sizes: $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, and 6 inches extension measure. The information obtained from these nets may give an accurate enough picture of present populations, especially of lake trout and chubs to permit assessment in future years of the changes brought about by the anticipated drastic reduction in sea lamprey populations.

Limnological investigations will be more limited than in 1953, but some of the same areas will be sampled to detect environmental changes which might have occurred. Collections and observations will include plankton, bottom organisms, water for chemical analysis, water temperatures, Secchi-disc readings, and water currents.

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WESTERN LAKE SUPERIOR FISHERY SURVEY (M/V Siscowet Cruise 1): The first cruise of the U. S. Bureau of Commercial Fisheries research vessel *Siscowet* during the 1959 season was conducted (April 27-May 6, 1959) in the Apostle Island area of western Lake Superior. Objectives of the cruise included studies on various species of chubs, and trawling with small-mesh trawls for fry and yearling stages of whitefish, lake trout, menominee whitefish, herring, and smelt. Trawling and gill-net fishing were conducted southeast of Stockton Island, south of Oak Island, west of Michigan Island, southeast of Rocky Island, east of Manitou Island, and south of Long Island in Chequamegon Bay. A small mesh net was also towed to capture fish larva. Bathythermograph casts were made at each station.

Gill nets (1-, $1\frac{1}{2}$ -, 2-, $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, and 3-inch mesh) were fished to sample various size groups of the species mentioned above. Chubs (*Leucichthys hoyi* and *L. zenithicus*) dominated the catch in 50 fathoms southeast of Stockton Island. The condition of the gonads suggested these fish had spawned last fall or early winter. The catch from nets set south of Long Island was light, consisting of very few herring, menominee whitefish, white sucker, perch, and walleye. Nets set southeast of Rocky Island caught 370 menominee whitefish varying in size from 4 to 17 inches. East of Manitou Island a set was made on a bank varying in depth

from 25 to 35 fathoms. *L. hoyi*, menominee whitefish, and longnose suckers dominated the catch. Seven small (6 to 11 inches) lake trout were also captured. South of Oak Island the catch from two sets consisted mainly of *L. hoyi* and smelt. Thirteen small (4 to 16 inches) lake trout and 16 (6 to 13 inches) whitefish were also taken.

Trawl catches were generally light. One 24-minute tow south of Oak Island took over 1,000 smelt (4 to 8 inches) and 2 small lake trout. Tows made southeast of Stockton Island took small numbers of slimy muddlers, ninespine sticklebacks, smelt, and johnny darters. Because of the poor catches in this area tows were conducted at night to determine if larger samples could be collected by trawling after dark. Nighttime trawl catches were increased by the addition of menominee whitefish to the catch. A total of 89 menominee whitefish were taken in one tow.

Tows were made with the fish-larva net over the rocky bottom west of Michigan Island. No fish were captured.

Surface temperatures varied from 35.0° F. southeast of Stockton Island to 41.5° F. south of Long Island in Chequamegon Bay. There was no evidence of stratification at any of the stations visited as temperatures remained fairly constant from surface to bottom.

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WESTERN LAKE ERIE BIOLOGICAL RESEARCH CONTINUED (M/V "George L." Cruises 1 and 2): The U. S. Bureau of Commercial Fisheries research vessel *Musky*, used on Lake Erie in 1957 and 1958, was found to be unseaworthy and the vessel was destroyed after the engine and equipment were removed. A 34-foot trap-net boat, the

George L., was leased for 1959 to continue biological research on Lake Erie fish.

Cruise 1 (January 1-March 1959): Thick ice formed over western Lake Erie during a severe winter but most of it had disappeared by April 1. A two-day limnological and fish population study

was made through the ice near South Bass Island in February in cooperation with the Ohio Division of Wildlife. The water temperature was 34° F.; few fish were caught.

The Madtom, a 16-foot boat equipped for trawling, is used as an auxiliary to the George L. for work in very shallow water. Trawl catches by the Madtom in Sandusky Bay and Cedar Point-Huron area in March consisted mostly of yellow perch, emerald shiners, and spot-tail minnows. Few fish were found in waters less than 10 feet deep.

Cruise 2 (April 1-30): The George L. was given a test run on April 15 when several trawl tows were made off Cedar Point Beach and in Sandusky Bay. Large numbers of spot-tail minnows were taken. Many yellow perch eggs were found on a gill-net set overnight although none of the numerous female perch taken by trawl and gill net appeared to be ripe or spent. Water temperature was 47° F. Most of the perch in Sandusky Bay had spawned by

April 30, but a large percentage of the female perch captured in the lake were still full of eggs.

Samples of important species of fish in the commercial catch were taken at several ports in Ohio. The Pennsylvania Fish Commission assisted by collecting samples in Pennsylvania ports. Catches of yellow perch and sheepshead were high and catches of walleye were fair in Ohio waters. Cold water and ice greatly limited fishing in Pennsylvania and New York.

Most of the yellow perch taken in the commercial fishery of Ohio were 3 years old, but about 50 percent of the catch was less than 8.5 inches long and had to be returned to the lake. Walleyes or yellow pike taken were mostly "jumbo" or "No. 1" -- few smaller fish were caught.

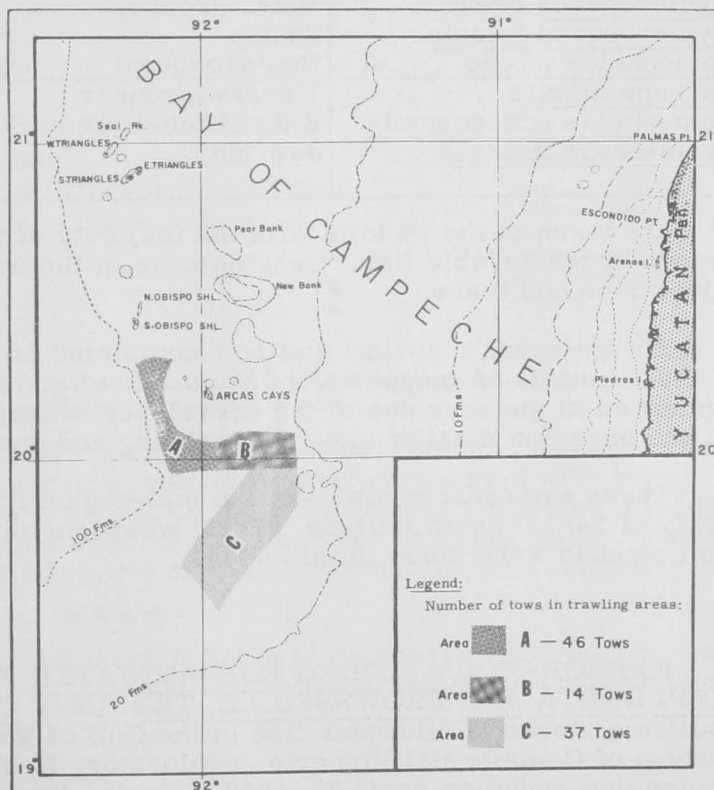
Environmental conditions in several areas in western Lake Erie were examined during the yellow pike and yellow perch spawning period by the Ohio Division of Wildlife and the Bureau's Laboratory.



Gulf Exploratory Fishery Program

COMMERCIAL RED SNAPPER TRAWLING OPERATIONS ON CAMPECHE BANK COMPLETED (M/V Silver Bay Cruise 16): A total marketable catch of 21,471 pounds (19,166 pounds of snapper and 2,305 pounds of grouper) was taken in 18 fishing days by the U. S. Bureau of Commercial Fisheries' exploratory fishing vessel Silver Bay, while conducting simulated commercial red snapper trawling operations on Campeche Bank in April 1959. Trawling operations were confined to three areas in the vicinity of Cay Arcas, where concentrations of snapper (Lutianus sp.) had been located during previous Silver Bay cruises. This cruise completes the programmed study of availability of red snapper to trawling gear.

A total of 97 trawl stations were completed in depths ranging from 21 to 55 fathoms. With the exception of three stations at which a new type 88-foot square trawl (no top square) was tested, all trawl stations were made with a 54-foot headrope-74-foot footrope nylon trawl rigged with 20-inch rollers the full length of the footrope and fished with standard V/D rig between the doors and the trawl. The trials with the 88-foot square trawl indicated a marked decrease in catching efficiency as compared to the standard trawl.



M/V Silver Bay Cruise 16 (April 2-May 6, 1959).

The catch (see table) was comprised of five species of snapper and six species of grouper. Approximately 75 percent of the snapper were red snapper (Lutianus aya);

approximately 50 percent large (10 pounds or over), 20 percent medium (5-10 pounds) and 30 percent small fish (1-5 pounds). Negligible amounts of small, unmarketable snapper were taken due to the use of a large-mesh cod end.

Best fishing was encountered in Area A (see chart) in 38 to 45 fathoms. Forty-six trawl drags in this area produced 11,904 pounds of red snapper and 902 pounds of grouper. Catches averaged 2,000 pounds per 12-hour fishing day with individual catches ranging from 115 to 1,000 pounds per 90-minute tow. The bottom was characterized by a sand and gravel bank which sloped gently from 38 to 55 fathoms with approximately 14 miles of clear trawling bottom extending in a northwest-southeast direction. No gear was damaged or lost in this area.

Fourteen tows in Area B failed to produce profitable catches of snapper and grouper, although the bottom throughout the area was characterized by broken coral and sponge formations. A total of 1,283 pounds of snapper and 410 pounds of group-

Table 1 - Catch of Snapper and Grouper by M/V Silver Bay during Cruise 16

Species	Common Name	Weight		
		Total	Average	Range
		(Lbs.)		
<u>Lutianus aya</u>	Red snapper	14,271	8	1- 20
<u>Lutianus analis</u>	Mutton or king snapper	3,760	10	5- 22
<u>Lutianus synagris</u>	Lane or rainbow snapper	624	1½	1- 4
<u>Lutianus apodus</u>	Schoolmaster snapper	251	5	2- 10
<u>Lutianus griseus</u>	Gray snapper	175	20	5- 30
<u>Lutianus vivanus</u>	Yelloweye or silk snapper	11	4	3- 5
<u>Lachnolaimus maximus</u> .	Hogfish	74	5	2- 8
		19,166		
<u>Mycteroperca bonaci</u> . . .	Black grouper	948	15	6- 30
<u>Mycteroperca falcata</u> . . .	Scamp	628	8	2- 10
<u>Epinephelus morio</u>	Red grouper	427	10	4- 12
<u>Garrupa nigrita</u>	Warsaw grouper	20	12	8- 15
<u>Epinephelus adscensionis</u>	Katy Mitchell or rock hind	22	3	1- 6
<u>Promicrops itaira</u>	Jewfish	260	130	60-200
		2,305		

er were taken in the 14 tows with the majority of the tows producing less than 100 pounds of marketable fish. Gear damage in the area was light and was confined to minor rips and tears.

Thirty-seven trawling stations completed in Area C resulted in a total catch of 5,979 pounds of snapper and 993 pounds of grouper. Severe gear damage was experienced in the area due to the prevalence of large coral formations and rocks, and on one occasion most of the trawl webbing and one trawl board was lost.

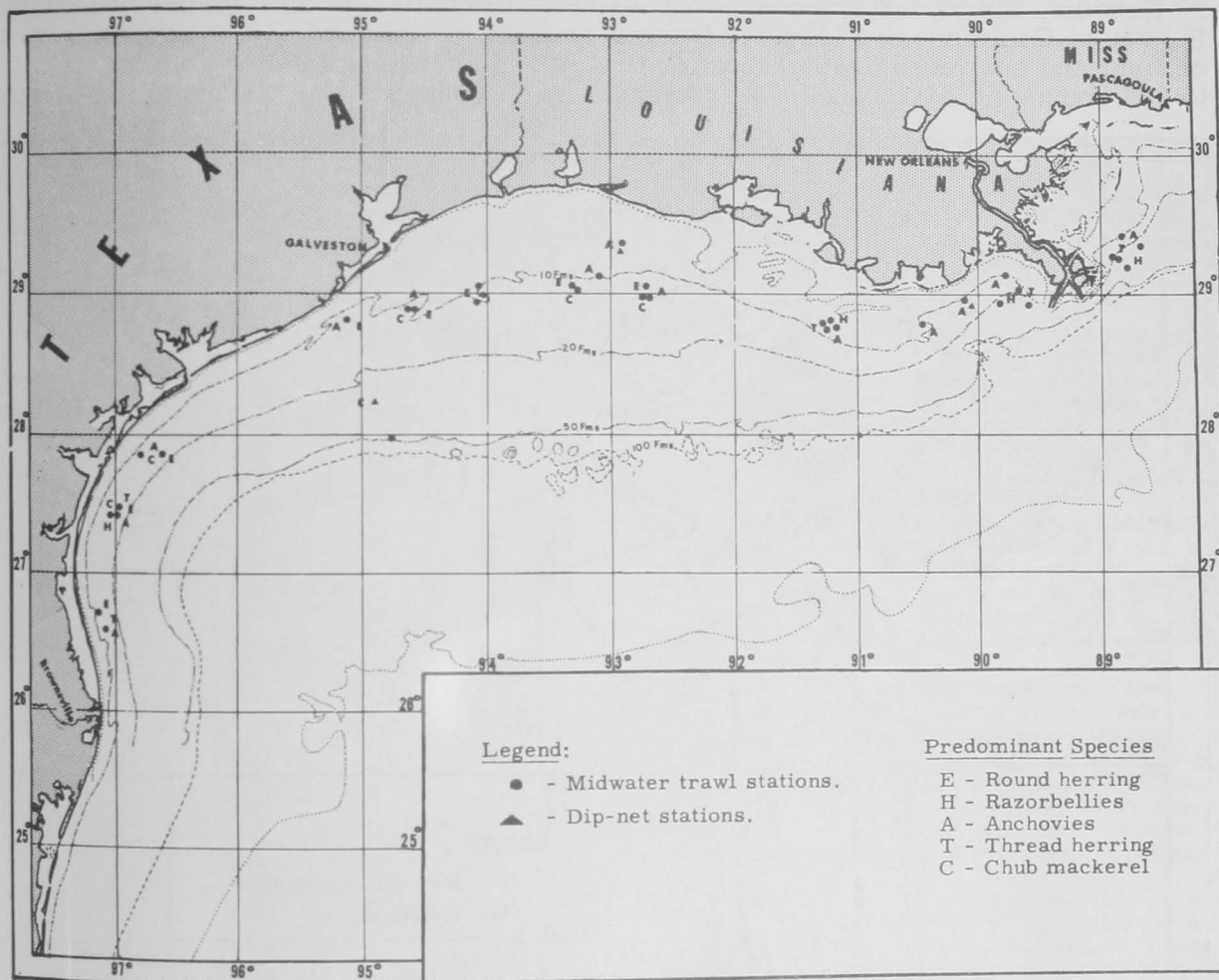
Three exploratory tows were completed on rocky and broken bottom in the vicinity of 24°10' north latitude, 97°25' west longitude in 22 to 49 fathoms. No significant catches were made in this area.

* * * * *

EXPLORATORY FISHING FOR MIDWATER FISH STOCKS BETWEEN MISSISSIPPI DELTA AND BROWNSVILLE, TEX. (M/V Oregon Cruise 58): The survey of available stocks of midwater fish in the Gulf of Mexico was continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon on a 23-day cruise that ended on April 30, 1959. During the cruise the vessel made 41 tows with 40- and 60-foot nylon midwater trawls in the 5-50 fathoms depth range between the Mississippi Delta and Brownsville, Tex.

Between Brownsville and Aransas Pass, Tex., numerous schools of mixed small thread herring (*Opisthonema*), razorbellies (*Harengula*), chub mackerel (*Scomber*), and round herring (*Etrumeus*) were encountered. All catches indicated that only small juvenile fish were present, and escapement through the meshes was heavy.

From Aransas Pass to Cameron, La., midwater fish schools were light and scattered. When sampled they yielded round herring, anchovies (*Anchoa*), and chub mackerel. Again all catches contained only very young fish and the apparent escapement was great.



M/V Oregon Cruise 58 (April 8-30, 1959).

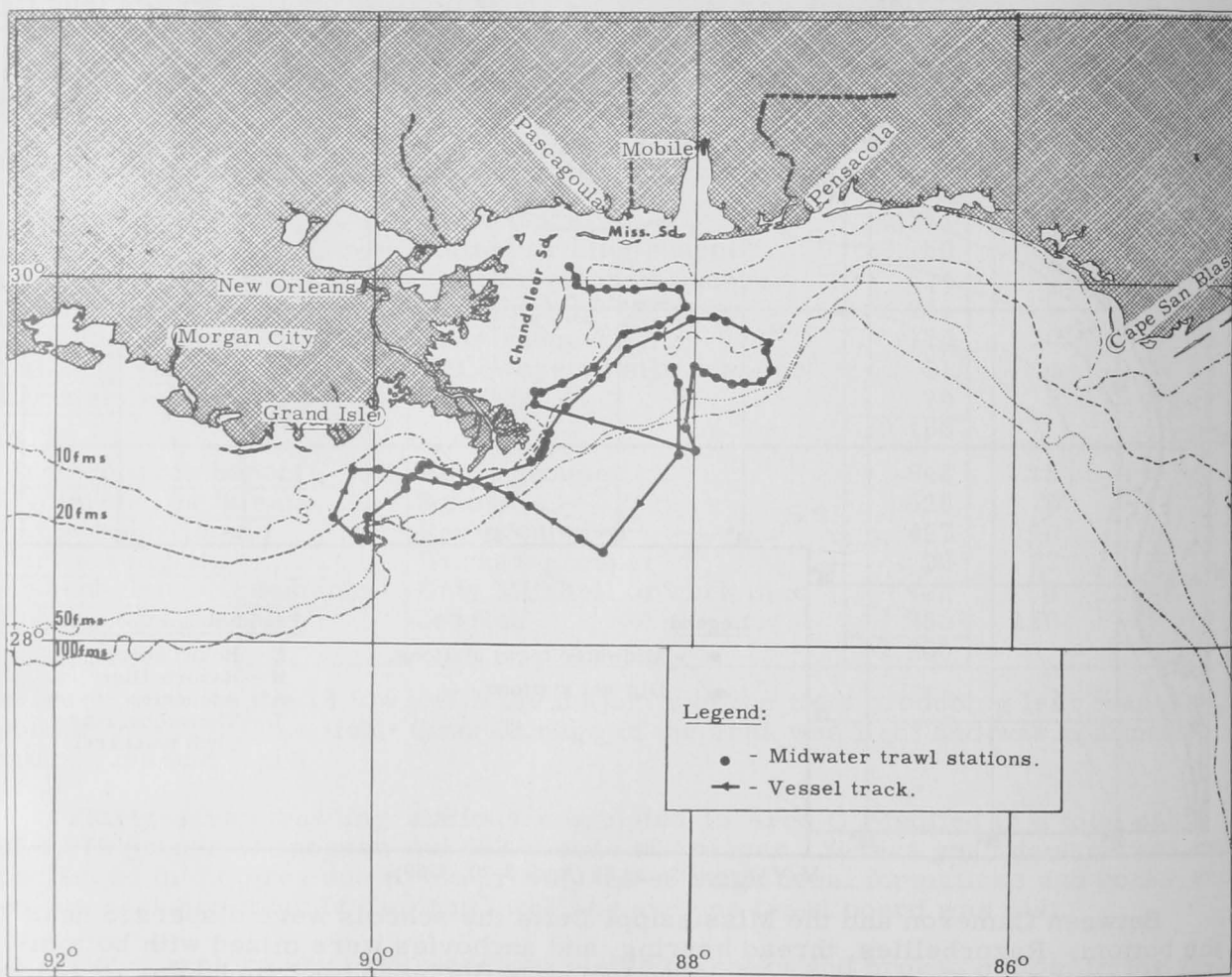
Between Cameron and the Mississippi Delta the schools were dispersed near the bottom. Razorbellies, thread herring, and anchovies were mixed with bottom-dwelling species. Several of these tows had up to 500 pounds of anchovies mixed in a 1,500-pound catch. The gear was subjected to some unplanned durability tests off a Mississippi River Southwest Pass when two manta rays weighing approximately one ton each were caught.

Southwest of Ship Shoal numerous large schools of menhaden (*Brevoortia*) were seen at the surface. Efforts to catch these during both day and night drags were unsuccessful.

* * * * *

MIDWATER TRAWLING FOR SCHOOL FISH IN THE NORTH CENTRAL GULF OF MEXICO (M/V Oregon Cruise 59): Round-the-clock scouting transects and trawling operations, designed to provide additional information on the seasonal occurrence of school fish and their availability to midwater trawling gear, was accomplished during the May 20-27, 1959, cruise of the M/V Oregon. A total of 60 tows was made using 40- and 60-foot square midwater trawls of nylon mesh varying in size from 5 inches in the wings to $\frac{1}{2}$ inch in the bag.

With few exceptions, observed schools were confined to waters shallower than 20 fathoms, and even there concentrations of the density met with on previous U. S. Bureau of Commercial Fisheries Oregon cruises were absent. Most sets were made on light and scattered depth-recorder traces and produced catches ranging from 10 to 200 pounds of mixed anchovies (Anchoa), scad (Decapterus), razorbellies (Haren-



M/V Oregon Cruise 59 (May 20-27, 1959).

gula), and round herring (Etrumeus). Best midwater catches were obtained immediately before sunset and after sunrise when the fish schools were presumably at a point midway between their nighttime surface and daytime bottom positions. Night-time midwater trawling was unproductive as was "blind" towing.

Near-bottom trawling, conducted east and west of the Mississippi River Delta at regular intervals, resulted in up to 3,000 pounds of mixed industrial fishes--predominantly croakers, spot, and porgies. Best near-bottom catches were obtained east of the Delta.

It is becoming increasingly evident that the art of midwater trawling differs considerably from that of bottom trawling and that comprehensive gear studies are indicated if optimum efficiency is to be obtained. Direct observation of the mid-water gear by SCUBA divers is being planned for future cruises.

Numerous schools of surface fish were observed east of Pass-a-Loutre and were tentatively identified as small anchovies.

Samples were collected and frozen for future study by Service technologists.

Gulf Fishery Investigations

Following are some of the highlights of the studies conducted by the Galveston, Tex., Biological Laboratory of the U. S. Bureau of Commercial Fisheries during January-March 1959.

SHRIMP: In January, a thorough coverage of shrimp landing ports in Florida was undertaken to

provide for recovery of stained shrimp released in the nursery grounds of upper Florida Bay. Fort Myers, Tampa, and all ports along the west coast were included as well as Key West and Marathon and Stock Island.

The first probable recovery of a stained shrimp was reported during this period. Four verified recoveries of stained shrimp released at Flamingo were taken on the Tortugas grounds and turned in by shrimp fishermen. The trypan blue stain used remained clear in shrimp recovered after fully 3 months and 26 days "out time." Calculated from the center of the 8-day release period and the mean release size, pink shrimp from the National Park nursery grounds grew at the rate of 3 mm. carapace length per month while moving 90 to 100 miles to the Tortugas trawling area. Stated another way, these small 120-140 count (heads-off) shrimp tripled their weight in a four-month period.

Another staining project was completed at Lower Matecumbe Key in March with the release of 4,000 shrimp taken, stained, and released on the fringe of Everglades National Park in outer Florida Bay. The first recovery from these releases near Lower Matecumbe Key showed up in the Tortugas fishery March 16, just 46 days after release. The shrimp had traveled approximately 74 miles.

At Key West it was reported that a blue-stained shrimp had been definitely picked up in the Atlantic Ocean southwest of Marathon in January--this is listed as a probable recovery since the shrimp was never turned in. This report partly confirms thinking on migration routes of pink shrimp entering the Tortugas grounds from upper Florida Bay. Large numbers probably move south through the Keys particularly at Channel Two, Whale Harbor, Tea Table Key, and Bahia Honda Key. These shrimp then move down Hawk Channel westward to the area of Marquesas Keys then north and northwestward across the Tortugas grounds.

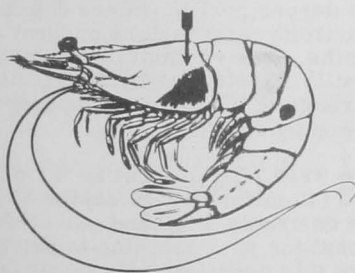
One problem in shrimp staining has been the limitation of only three available colors. This could lead to confusion if too many releases were made in contiguous areas over a short period. By mixing stains, two additional colors, purple and brown, have been developed.

Analysis of data on seasonal changes in size and species composition of trawl hauls in Clear Lake were continued this quarter. Effort was concentrated on analyzing stomach contents of fish

STAINED SHRIMP 50¢ REWARD

Shrimp have been marked with blue, green and red biological stains — in order to obtain information on migrations and growth. The color appears only on both sides of the head (in the gills) as shown in the illustration.

Look for color here



A reward of 50¢ will be paid for stained shrimp when returned with the following information:

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

NOTIFY BY MAIL THE U.S. FISH AND WILDLIFE SERVICE, BIOLOGICAL LABORATORY, P.O. BOX 3098, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE SERVICE AGENT OR REPRESENTATIVE.

Stained shrimp must be verified by Fish and Wildlife Service biologist before payment. The stains used are approved for this use by the Food and Drug Administration.

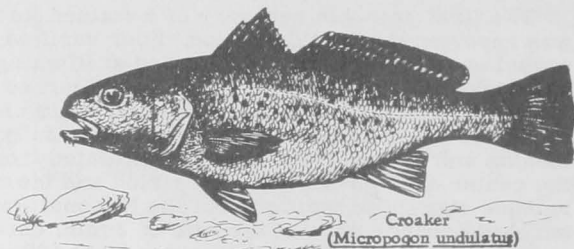
Fig. 1 - Poster placed at key points in the Gulf States area encouraging the return of stained shrimp.

collected in the lake during the past year to determine the degree of predation by juvenile fishes on post-larval and juvenile penaeid shrimp.

Thus far, 1,723 fish stomachs collected from January through July 1958, have been studied. They include 870 croakers (*Micropogon undulatus*); 216 sand trout (*Cynoscion arenarius*); 26 spotted trout (*Cynoscion nebulosus*); 52 redfish (*Sciaenops ocellatus*); 71 spotfin whiffs (*Citharichthys spilopterus*); 35 spot croakers (*Leiostomus xanthurus*); 50 gafftopsail catfish (*Bagre marinus*); 13 hard-head catfish (*Galeichthys felis*); and several minor species numbering ten or fewer specimens each.

The dominant type food organism in the stomachs examined are listed in decreasing order of percentage frequency occurrence: copepods, mysids, fish, polychaetes, amphipods, decapods (mostly grass shrimp and crabs), isopods, and insects.

The most abundant game fish, croaker, apparently fed on penaeid shrimp to a very limited extent; major food items included copepods, mysids,



and fish. Of the other gamefishes, redfish and spotted trout did not occur in abundance at the lake except when post-larval penaeid shrimp were absent. The sand trout, also a game fish, fed mainly on mysids and larval grass shrimp and to a lesser extent, post-larval penaeids.

An interesting aspect of the results to date is that although several species of fish were present during a period of abundance of penaeid post-larvae, their stomachs contained mostly other crustacea, viz., copepods, mysids, grass shrimp larvae, and amphipods.

RED TIDE STUDIES: Studies to determine the nutritional value of specific trace metals were continued. Preliminary results indicate that media containing molybdenum, strontium, barium, rubidium, manganese, zinc, titanium, and zirconium were as good or better for the growth of *Gymnodinium breve* than control media with no trace metal additives. On the other hand, media containing chromium, vanadium, aluminum, nickel, and copper did not improve growth with the concentrations used.

Experiments were conducted to determine the effects of variations of the calcium and phosphorus content of media on the growth of *G. breve*. The results indicate that *G. breve* will not grow in media if the calcium content is less than .05 grams per liter or greater than 2.5 grams per liter. Within the above range, growth depends on the phosphorus concentration. More phosphorus is required if the calcium concentration is low and less phosphorus if the calcium concentration is high. These results indicate that a balance of calcium and phosphorus is required for good growth of *G. breve* and that

specific ratios of these elements may be necessary for blooms of this organism to develop.

Investigation of the temperature tolerance of cultures of *G. breve* has been continued during this quarter. The absolute low limit of temperature tolerance seems to be about 7° C. (44.6° F.)--for 10 ml. cultures maintained at a distance of two inches from a 14-watt fluorescent tube. The time required for this temperature to be lethal is apparently related to the rapidity with which the test cultures are cooled to this level.

At the other end of the tolerance range, a temperature of 30° C. (86° F.) reduced culture populations to less than 10 percent of the initial level after one week of exposure. Four hours of exposure to 35° C. (95° F.) reduced the culture populations to less than one percent of the original level. Twenty-four hours at this temperature was found to be 100 percent lethal.

Attempts to determine the effect of pH's above 8.2 on the growth of *G. breve* have not been successful thus far.

The screening of organic chemicals was started during the latter part of this quarter. The object of this program is to discover organics with specific toxicity to *G. breve*. Thus far, a dozen of the hundred or so chemicals screened have shown various degrees of toxicity. Of these, three killed all organisms within a 0.01 to 0.04 p.p.m. range.

A total of 369 samples were collected during this period and *G. breve* were present at 27.4 percent of the stations. The northern range of *G. breve* is now limited to the St. Petersburg Beach area, although *G. breve* were still found south along the coast to Venice and from the mouth of Tampa Bay to 40 miles offshore. No *G. breve* were in the fresh and brackish water samples taken in Tampa Bay. The general incidence of *G. breve* decreased even in the deeper neritic waters due mainly to the adverse environmental factors present during the winter months. The vertical distribution of this organism still exhibits patchy distribution and due to the low range of numbers no apparent diurnal migration can be shown.

G. breve were still present as far offshore as we sampled (40 miles) and to depths of 128 feet. It would be desirable to extend our offshore sampling, at least for spot checking to determine how far offshore this organism may occur during periods of non-red tide. The surface samples in all subareas still have the highest incidence of *G. breve*, 24.8 percent compared to 11.4 percent for the bottom water samples.

Concentrations of *G. breve* ranged from 0-200/l. The highest concentrations were again present in waters exceeding 18 feet. All stations showed a seasonal decline with the exception of Egmont Key south to Venice where a gradual increased incidence was noticed during March.

The low range in numbers follows the same pattern shown during other years (1955-1958) and probably represents the minimal population level of *G. breve*.

Large "butterfly" cells of *G. breve* were again present offshore.

INDUSTRIAL FISHES: Periodic sampling of the catches of trawlers operating out of Pasca-



Fig. 2 - Dumping fish into tanks at beginning of conveyer line at a Gulf of Mexico plant using industrial fish in canned pet food.

goula, Miss., supplying pet food plants continued as the principal activity. Present data indicate that there is a much greater variance between vessels than within individual ones as to species composition. Therefore, in order to obtain reasonably accurate determination of species composition with the man hours available for this work, it was necessary to sample as many of the vessels landing fish as possible even at a slight sacrifice of sample size within individual loads due to the small sample size adopted. The average number of species per sample, the total number of boats landed, the number of boats sampled, and the percent of boats sampled from October 1958 through January 1959 is as follows:

	1958			1959
	Oct.	Nov.	Dec.	Jan.
Average number of species per sample ..	20	22	21	14
No. boats landing	155	118	129	95
No. boats sampled	10	22	23	40
Percentage of boats sampled	6.5	18.6	17.8	42.1

The species composition by weight and numbers of the industrial fish catch has been determined since October. The percentages by weight of the more important species from October to February 1958-1959 are:

Percentage of	1958			1959
	Oct.	Nov.	Dec.	Jan.
Croaker (<i>Micropogon undulatus</i>)	54.7	51.2	66.2	39.6
Spot (<i>Leiostomus xanthurus</i>)	3.0	9.1	9.8	23.0
Weakfish (<i>Cynoscion</i> sp.)	9.3	1.5	6.7	11.1
Miscellaneous	35.7	38.2	17.3	26.3



Maine Sardines

CANNED STOCKS, APRIL 1, 1959: Distributors' stocks of Maine sardines totaled 254,000 actual cases on April 1, 1959--39,000 cases or 13.0 percent less than the 293,000 cases on hand April 1, 1958, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on April 1, 1959, totaled 474,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), about unchanged from the 476,000 cases on hand April 1, 1958.

Type	Unit	1958/59 Season			1957/58 Season			
		4/1/59	1/1/59	11/1/58	7/1/58	6/1/58	4/1/57	1/1/58
Distributors	1,000 Actual Cases	254	268	312	184	237	293	230
Canners	1,000 Standard Cases ^{1/}	474	891	1,037	386	235	476	1,111

^{1/}100 $3\frac{3}{4}$ -oz. cans equal one standard case.

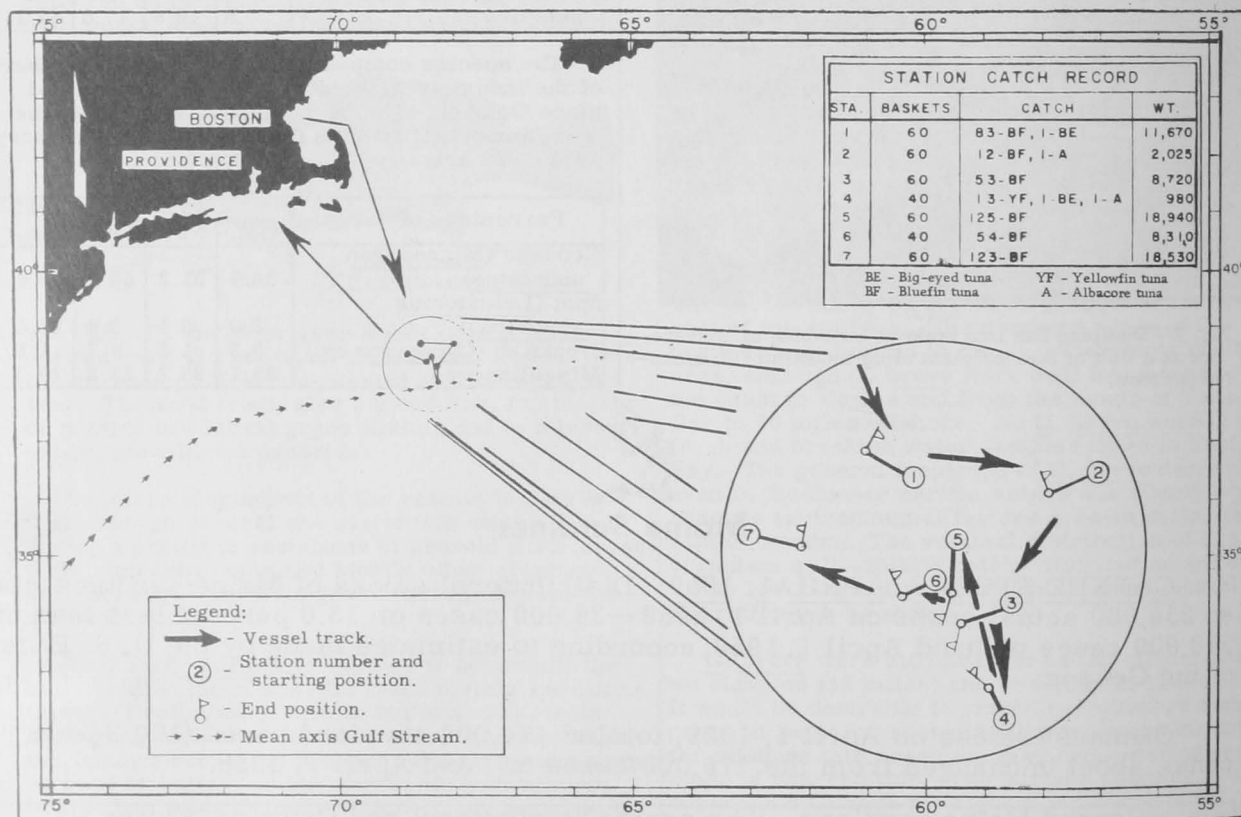
The 1958 pack from the season which opened on April 15, 1958, amounted to 2,021,000 standard cases as compared with 2,117,151 standard cases in 1957.

The supply as of April 1, 1959, totaled 2,434,000 standard cases, or 4.3 percent less than the total supply of 2,543,000 cases as of April 1, 1958. Shipments from April 15, 1958, to April 1, 1959, amounted to 1,960,000 standard cases as compared with 2,067,000 cases from April 15, 1957, to April 1, 1958.



North Atlantic Fisheries Exploration and Gear Research

GOOD CATCHES OF TUNA TAKEN ON EDGE OF GULF STREAM SOUTH-BY-EAST OF NANTUCKET (M/V Delaware Cruise 59-6): Commercial quantities of tuna were found to be readily available to long-line gear in an area on the edge of the Gulf Stream about 140 miles south-by-east of Nantucket, during a May 18-29 cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. In seven fishing days, the vessel caught about 35 tons of tuna (mostly bluefin) on about two-thirds of the amount of gear which would be used on a commercial fishing trip.



M/V Delaware Cruise 59-6 (May 18-29, 1959).

The specific objective of the cruise was to explore for concentrations of tuna, in a limited area, along the north edge of the Gulf Stream approximately 140 miles south-by-east of Nantucket Lightship. The location was determined by analysis of data obtained during previous long-line fishing explorations by the Delaware.

Seven long-line sets were made during this cruise, and a total of 380 "baskets" of gear were fished. Each basket of gear was of standard 10-hook commercial type. At Stations 1, 3, 5, 6, and 7 (see chart), 33 tons of bluefin tuna (*Thunnus thynnus*) were caught in five days of fishing utilizing only 280 baskets of gear. This was a catch rate of 15.6 bluefin per 100 hooks. The surface temperatures at these stations ranged from 51° F. to 63.5° F.

The southermost station (lat. $38^{\circ}06'$ N., long. $68^{\circ}16'$ W.), located near the axis of the Gulf Stream, yielded three species of tuna: yellowfin (*Thunnus albacares*), big-eyed (*Thunnus obesus*), and albacore (*Thunnus alalunga*). No bluefin tuna were taken at that station. The surface water temperature was 73° F.

No gear loss or significant damage was experienced during the cruise. Relatively few sharks were caught and only one tuna was shark-bitten. Notable was the absence of the white-tip shark (*Pterolamiops longimanus*) even in the warmer waters where yellowfin were taken. Previous cruises have shown that later in the season this species is one of the commonest sharks in the area.

The bluefin tuna averaged about 150 pounds; the size range was from 120-450 pounds. Yellowfin tuna taken at Station 4 ranged from 30-130 pounds each.

Bathythermograph casts were made at each station to determine subsurface temperatures. Evidence from the bathythermograph traces indicated the presence of a convergence of cool water with the warmer water of the Gulf Stream.

A total of 97 bluefin tuna were tagged with plastic dart tags and released. Tagging operations, in addition to other biological collections and oceanographic observations, were conducted in cooperation with the Woods Hole Oceanographic Institution.

At the conclusion of the cruise, 25 tons of tuna were unloaded and placed in storage at Providence, R. I.



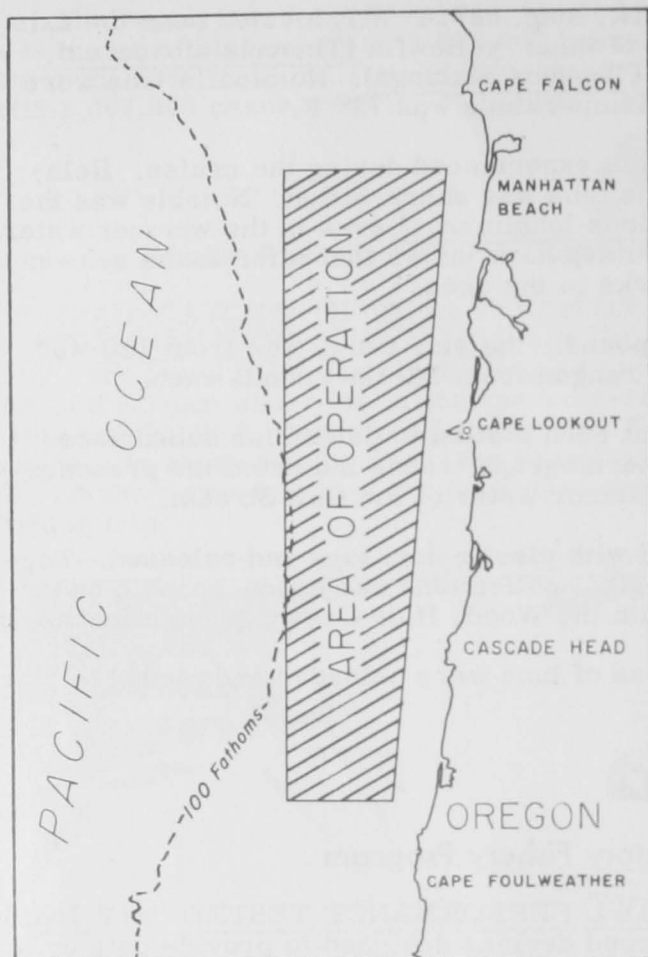
North Pacific Exploratory Fishery Program

DEVICES TO IMPROVE OTTER-TRAWL PERFORMANCE TESTED (M/V John N. Cobb Cruise 42): Several recently-developed devices designed to provide data on otter-trawl performance and bottom conditions were tested during a three-week cruise (ended May 1, 1959) of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. In addition, a cooperative tagging program was carried out with biologists of the Oregon Fish Commission.

The instrumentation studies included tests of a new electrical trawl cable designed to monitor and telemeter information from the fishing gear on the ocean floor to the bridge of the vessel. The cable, which has the dual purpose of operating as a standard trawl warp for fishing gear and for carrying electrical impulses, performed satisfactorily and no conductor breakages were noted during operations. Information telemetered through the cable included a measure of the depth at which the net is operating, the temperature of the water at the net, and information on the performance of the fishing gear. The latter information, which is monitored by a newly-designed "on-bottom-indicator," shows via a light on the bridge of the vessel when the trawl doors reach the bottom and whether or not the net is fishing on the ocean floor. When the doors are functioning properly, a light flashes



Fig. 1 - The Bureau's exploratory fishing vessel John N. Cobb.



M/V John N. Cobb Cruise 42 (April 1959).

on in the pilothouse of the vessel. If the trawling speed is too fast or currents are encountered which alter the performance of the gear (causing it to lift from the bottom), then the circuit is broken and the light on the bridge goes off. This new device could be of considerable value to commercial trawlers and eliminate much of the guesswork from trawl fishing.

Another device perfected during the cruise was an automatic bottom sampler with a quick release device for easy attachment and removal from a trawl door. When the trawl door contacts the bottom the instrument scoops up a sample of the bottom and automatically closes and retracts. The device will allow fishermen or scientists to be accurately informed about bottom types in areas they fish.

A cooperative tagging program was conducted off the Oregon Coast in the vicinity of Manhattan Beach and Ocean Lake. A total of 5,102 tagged fish were released in two weeks of fishing. Of this total, 4,565 were English "sole" and 537 petrale "sole." Biologists from the Oregon Fish Commission hope that this tagging experiment will assist in determining the migrational habits of those species.



Salmon

CALIFORNIA PLANTS MARKED KING SALMON FINGERLINGS: The first phase of an investigation into the life history of the king salmon was completed late in May 1959 by the California Department of Fish and Game biologists. The investigation is designed to learn why the valuable sport and food fish has declined in recent years and what, if anything, can be done. It is hoped the project will ultimately point out ways of improving salmon fishing.

"It will be no overnight project," the Department's Director cautioned. "Because the life cycle of the king salmon is approximately four years, we cannot expect any real results from the first experiment until at least 1962."

The first experiment consisted of releasing one million tiny king salmon (2 to 3 inches long), bearing distinctive marks, at three places in the Sacramento River. This large-scale, complex operation began and ended in less than two months. Next year the number of marked fish released will be doubled.

Primary purpose of the first phase of the project is to measure differences in survival of fish released at various distances from the ocean. Effects of the differences will be measured as those fish appear in sport and commercial landings and on the spawning beds.

"While a more comprehensive project is planned for each of the next four years, practical problems arising from this year's work must first be solved if we are to succeed," the Director stated. He pointed out the results of this year's experiment were far different than the experience learned in a preliminary test the Department conducted in 1958.

"A few thousand fingerlings were transported last year from fresh to salt water in live-bait tanks aboard a boat and survival was nearly perfect, almost 100 percent," the Director reports.

"Using essentially the same technique and the same boat we found that survival this year ranged from 30 percent to 90 percent," he stated. "Our scientists have not yet pinned down the reasons for such a wide variation."

Another group of fish was trucked directly to the salt-water release site. Once there, salt water was pumped into the truck tank until fish were in water of the same salinity and temperature as that into which they were released. Six different lots received this treatment and their survival ranged from 10 percent to 40 percent.

On the other hand, survival of the two groups released at different places in fresh water has averaged about 90 percent.

Since quick transportation, with high survival, is essential to the success of the project, California biologists will continue experiments to try to solve the problem this year.

Personnel stationed at the U. S. Fish and Wildlife Service's Coleman Hatchery, located on Battle Creek near Redding, produced the fish and provided facilities for Department personnel to do the marking. In addition, the Federal agency trucked one-fourth of the marked fish to Hamilton City (near Chico) for release. Department personnel and trucks transported the remaining 750,000 marked fish to either Rio Vista or Tiburon (near Sausalito) for release.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1959:

Oyster Research: All experimental oysters showed a moderate amount of growth during the first quarter of 1959, but considerably more than during the comparable period of 1958. Less than one percent died. Last year for the same period of time it was about five percent. This coincided with the extreme cold.

Seed oysters brought from Long Island in November grew at about a comparable rate as South Carolina seed. The New England seed suffered no greater mortality than young local oysters.

In February, a trunk was placed under the causeway between the two larger experimental ponds. This will allow the use of water from either pond for flushing the other pond when it is drained. A trial of this system in the latter part of March indicated its practicability, and it should be very helpful in controlling silting, one of the greatest problems connected with pond cultivation of oysters.

Shrimp Research: Experimental trawl hauls were made regularly throughout the quarter. The results have been tabulated, and compared with the catches made in 1958 and with the mean catch for a comparable time from 1953 through 1956. The cold winter of 1958--the coldest in 25 years--decreased the availability of the catch. This year shows a remarkable recovery. Croaker, shrimp, and crabs are

more abundant than before the freeze. If there is a cause-effect relationship between the availability of shrimp in this quarter with the catch the following fall, then this should be a good year for white shrimp. There is the possibility, however, that the excessive rains of this March (over 6 inches in 12 hours) will upset any favorable balance due to increased availability of shrimp this quarter.

Crab Research: Again this year biologists from the U. S. Bureau of Commercial Fisheries Laboratory at Beaufort, N. C., have joined forces with Bears Bluff Laboratory to tag mature blue crabs. Over 2,000 crabs were tagged in March. Approximately a third were tagged and released near the mouth of Five Fathom Creek, 25 miles north of Charleston. A third were released in the immediate vicinity of Charleston Harbor, and the remaining third were handled near the mouth of the North Edisto River. Fishermen are urged to return these tags to help increase knowledge about the movement of crabs. The tagging work last year indicated that although most of the crabs were caught near where they were tagged, some crabs moved a considerable distance. (Progress Report No. 39, January-March 1959, of the Bears Bluff Laboratories, Wadmalaw Island, S. C.)

Note: Also see Commercial Fisheries Review, February 1959, p. 32.



Spot

ABUNDANCE IN CHESAPEAKE BAY PREDICTED LOWER IN 1959: Although 1959 will probably be a poor year for catching spot (*Lelostomus xanthurus*) in great numbers, the chances of catching an oversized one are the best in many years, according to a marine biologist at the Virginia Fisheries Laboratory. Since 1955 Virginia biologists have been studying this species from its early development through the nursery areas and into the commercial fishery.

The sport and commercial fishery for spot is generally supported by two-year old or younger fish. From their abundance in monthly trawl surveys and from scale readings to determine the ages of fish in the commercial catch, the biologists here found that spot hatched in the winter of 1955/56 met with unusual success, and unusually great numbers were present in the Bay the following spring and summer. Many large spot appeared in the fishery in 1958, survivors of that successful spawning.

"It is unusual to find spot past three years old in the commercial catch," the biologist stated, "but because of the high abundance of young fish in 1956 a larger than usual number should appear this summer, so that fishermen have the best opportunity in years of catching a fish of record size. Because the abundance of young spot decreased in 1957 and 1958, not as many will be available to fishermen this summer as last year. Seventeen times as many small spot were taken in samples collected by the Laboratory biologists in 1956 as in 1957, and three times as many as were present in 1958."

The biologists estimate that not more than 15 percent of all of the spot present in Chesapeake Bay and its rivers are caught annually by commercial and sport fishermen, and that approximately 60 percent die from predation, disease, and other natural causes, or leave the Bay. This indicates that the number of fish taken by the fishery has a relatively small effect on catches in subsequent years. "When natural conditions favor the larval and young fish, there are plenty for all fishermen," the biologist stated.

Spot make a very rapid growth during their first two years. At the end of the first summer they average about 5 inches, though some may be as much as 7 inches long, but by the end of the second summer they average nearly 9 inches, and weigh

about a half pound. That little or no growth occurs during the winter months has been proved by sampling the winter trawl fishery.

Biologists at the Virginia Fisheries Laboratory are confident that through their sampling devices they can give fishermen an accurate prediction of the relative abundance of spot at least a year in advance.



Standards

PROPOSED STANDARDS FOR FROZEN COD FILLETS AND BREADED PORTIONS REVIEWED AT MEETINGS: United States Standards for Grades of (1) Frozen Cod Fillets and (2) Frozen Raw Breaded Portions--prepared by the U. S. Bureau of Commercial Fisheries after careful consideration of all data and views submitted by individual members of industry, trade associations, and from other sources--were the subject of further review at a series of public meetings held between June 9-15, 1959.

These standards are designed to serve as a convenient basis for sale in wholesale transactions, for establishing quality-control programs, and for determining loan values on stocks. They will also enable inspection and grading of these commodities by the Federal inspection service of the Bureau, which service is available for the inspection of other processed fish products as well.

It is the policy of the Bureau to build standards of quality that (1) will accurately represent differences in market value; (2) will bring about a uniform quality description in simple, easily understood terms upon which satisfactory trading can be effected; and (3) may be useful in establishing quality-control programs.

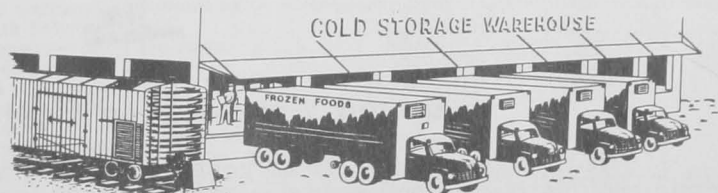
The proposed standards for frozen cod fillets and frozen raw breaded portions were reviewed at public meetings in Boston on June 9, 1959, in Chicago, June 11, 1959, and in Seattle on June 15, 1959. Following the final review of the proposed standards for frozen cod fillets and frozen raw breaded portions, taking into consideration the comments received, the standards will be published in the Federal Register.

Packers, brokers, distributors, users, and other interested parties were invited to attend the meetings or send in comments on the proposed standards.



Transportation

EXEMPT TRUCKING OF FRESH AND FROZEN FISHERY PRODUCTS UNDER STUDY: A study of "exempt trucking" of fresh and frozen fish and shellfish is being made by the U. S. Bureau of Commercial Fisheries. The firm awarded the contract to make the study will interview about 350 shippers and 200 carriers of fresh and frozen fishery products in 28 states covering all producing areas of the country.



Little is known about the transportation of fresh and frozen fishery products. Motor carriers are not subject to economic regulation by the I. C. C. when trans-

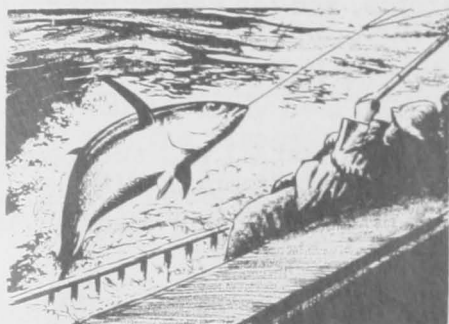
porting these products. Therefore, there is no reporting of movement of such items as to number of vehicles and tons carried, nor is there a requirement to publish rates and adhere to specific routes. This exemption from regulation is based on the fact that those fishery products are perishable and production is seasonal and cannot be scheduled. These requirements preclude their movement by firmly established routes or on established schedules.

The objective of the study is to ascertain the significance of "exempt truck" transportation to fresh and frozen fish and shellfish producers, dealers, and processors. The study will be mainly concerned with the value of the service rendered by the exempt truckers as compared with the regulated service.



Tuna

CALIFORNIA CAPTAIN FISHING OUT OF PUERTO RICO REPORTS TUNA PLENTIFUL IN EASTERN ATLANTIC: A San Diego tuna vessel captain fishing out of Ponce, Puerto Rico, says that tuna are plentiful in Eastern Atlantic. The captain returned to San Diego in April for a visit after making a pioneering voyage to African waters on the 148-foot clipper Chicken of the Sea.



The vessel is owned by a California fish cannery and is 1 of 8 former California clippers now fishing for the company's cannery in Ponce, Puerto Rico. The San Diego captain is on his second voyage to west African waters, together with one or two other boats from the same company.

He said that the vessel's 17-man crew caught 450 tons of tuna in 14 days of fishing. Most of the 110-day trip, he said, was spent making courtesy calls on government officials in ports along the west coast of Africa in preparation for more visits by the company's clippers.

"We saw tuna every day from the time we left Puerto Rico till we reached the African coast," he said. He reported that there was plenty of herring to be had for bait near the African coast.

Most of the catch was made about 100 miles south of Dakar and about 120 miles offshore.

At times, he reported, the crew poled yellowfin tuna as fast as they could pull them in. The fish weighed from 40 to 60 pounds each.

Now fishing out of Ponce are the clippers American Beauty, Western Ace, Western King, American Queen, Espiritu Santo, Corsair, and Beverly Lyn, all formerly of San Diego.



United States Fishing Fleet^{1/} Additions

MARCH 1959: A total of 29 vessels of 5 net tons and over were issued first documents as fishing craft during March 1959--24 less than in March 1958. The Gulf area led all other areas with 9 vessels, followed by the Chesapeake with 8 vessels, the South Atlantic with 6, and the New England and Middle Atlantic areas with 3 each.

^{1/}Includes both commercial and sport fishing craft.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, by Areas, March 1959

Area	March		Jan.-Mar.		Total
	1959	1958	1959	1958	
	(Number)				
New England	3	1	5	3	13
Middle Atlantic	3	-	3	3	13
Chesapeake	8	7	21	24	99
South Atlantic	6	9	18	32	135
Gulf	9	27	25	62	270
Pacific	-	6	8	19	112
Great Lakes	-	-	3	2	10
Alaska	-	3	2	3	31
Virgin Islands	-	-	-	1	1
Total	29	53	85	149	684

Note: Vessels assigned to the various sections on the basis of their home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, March 1959

Net Tons	Number
5 to 9 . . .	11
10 to 19 . . .	8
20 to 29 . . .	3
30 to 39 . . .	5
40 to 49 . . .	1
180 to 189 . . .	1
Total	29

From January-March 1959, a total of 85 vessels were documented as fishing craft, a decline of 64

vessels as compared with the first three months of 1958. Most of this decline occurred in the Gulf area with 37 vessels documented as compared with the 1958 three-months period.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, FEBRUARY 1959: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during February 1959 decreased by 17.5 percent in quantity and 14.1 percent in value as compared with January 1959. The decrease was due primarily

Item	Quantity			Value		
	1959	1958	1958	1959	1958	1958
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed ^{1/} . . .	72.5	62.3	956.8	21.3	18.3	278.4
Exports:						
Fish and shellfish: Processed only (excluding fresh and frozen) . . .	3.3	2.8	41.2	1.0	0.8	15.6

^{1/}Includes pastes, sauces, clam chowder, and juice, and other specialties.

to lower imports of groundfish fillets (down 10.6 million pounds) and canned tuna in brine (down 1.7 million pounds), and to a lesser degree, a decrease in the imports of shrimp and frozen tuna other than albacore. These decreases were partly offset by a 2.7-million-pound increase in the imports of fillets other than groundfish and frozen albacore tuna (up 3.6 million pounds).

Compared with February 1958, the imports in February 1959 were up by 16.9 percent in quantity and 16.4 percent in value due to higher imports of frozen albacore and other tuna (up 12.0 million pounds), and frozen shrimp (up 3.0 million pounds). Compensating, in part, for the increases was a drop of about 3.6 million pounds in the imports of groundfish and other fillets.

United States exports of processed fish and shellfish in February 1959 increased by 38.2 percent in quantity and 25.0 percent in value as compared with January 1959. Compared with the same month in 1958, the exports in February 1959 were higher by 19.8 percent in quantity and unchanged in value. The exports this February as compared with the same month in 1958 were up due to increased exports of California sardines.

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EDIBLE FISHERY PRODUCTS, MARCH 1959: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during March 1959 increased by 12.1 percent in quantity and 21.3 percent in value as compared with February 1959. The increase was due primarily to higher imports of groundfish fillets (up 2.2 million pounds) and canned salmon (up 3.6 million pounds), and to a lesser degree, an increase in the imports of frozen shrimp, canned sardines, and fresh and frozen salmon. These increases were partly offset by a 1.2-million-pound decrease in the imports of frozen albacore tuna.

Compared with March 1958, the imports in March 1959 were up by 22.8 percent in quantity and 10.5 percent in value due to higher imports of groundfish fillets (up 1.3 million pounds), frozen tuna including albacore (up 12.0 million pounds), and frozen shrimp (up 3.5 million pounds). Compensating, in part, for the increases was a drop of about 0.6 million pounds in the imports of canned tuna and frozen spiny lobsters (down 0.7 million pounds).

United States Foreign Trade in Edible Fishery Products, March 1959 with Comparisons

Item	Quantity			Value		
	March 1959	Year 1958	Year 1958	March 1959	Year 1958	Year 1958
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed ^{1/} . . .	84.1	68.5	956.8	24.3	22.0	278.4
Exports:						
Fish & shellfish: processed only ^{1/} (excluding fresh and frozen) . . .	7.7	2.1	41.2	2.1	0.6	15.6

^{1/}Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in March 1959 were up 131.9 percent in quantity and 110.0 percent in value as compared with February 1959. Compared with the same month in 1958, the exports in March 1959 were higher by 260.3 percent in quantity and 250.0

percent in value. The exports this March as compared with the same month in 1958 increased due to the better stocks of California sardines available for export to foreign markets.

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GROUND FISH FILLET IMPORTS, APRIL 1959: During April 1959, U. S. imports of groundfish and ocean perch fillets and blocks amounted to 19.1 million pounds--an increase of 4.8 million pounds (33 percent) as compared with the corresponding month of last year.

Iceland was the leading shipper with 7.8 million pounds--a gain of 3.1 million pounds compared with April 1958. Canada was second with 5.8 million pounds--1.3 million pounds below the same month of last year. Denmark followed with 3.7 million pounds (up 1.7 million pounds), and Norway with 1.1 million pounds compared with only 4,000 pounds in April of 1958.

During the first four months of 1959, imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets, including blocks, amounted to 60.6 million pounds. Compared with the same period of last year, this was a gain of 14.4 million pounds or 31 percent. Canada (22.8 million pounds) supplied 38 percent of the 1959 four-months total; Iceland 34 percent (20.8 million pounds); Norway and Denmark each 12 percent. The remaining 4 percent was supplied by West Germany, Miquelon and St. Pierre, the Netherlands, the United Kingdom, and Ireland.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the 12½-percent rate of duty is 52,372,574 pounds. Any imports in excess



of the quota will be dutiable at 25 percent ad valorem.

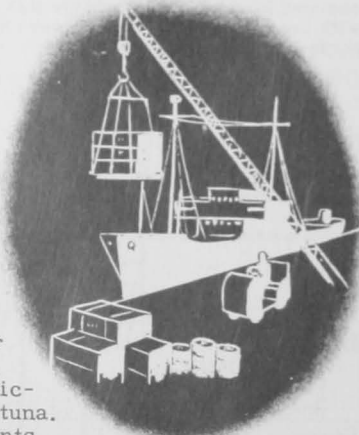
Imports January 1-May 2, 1959, amounted to 14,958,862 pounds, according to data compiled by the U. S. Bureau of Customs. During January 1-May 3, 1958, a total of 12,490,111 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.

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IMPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1959: First quarter trends showed further gains in United States imports of groundfish and ocean-perch fillets, tuna, shrimp, scallops, and fish meal.

Groundfish and Ocean-Perch Fillets and Blocks: Imports during the first quarter of 1959 were 19 percent above the same quarter of 1958. Canadian shipments of groundfish were lower this year, but Icelandic, Norwegian, and Danish shipments were higher.

Tuna, Fresh or Frozen: Imports during the first quarter of 1959 continued at a high level. Albacore imports were up 29 percent over the same 1958 period; other tuna, mainly yellowfin and big-eyed, were up 129 percent. Japan, by far the leading source, shipped both Atlantic- and Pacific-caught tuna. In addition, shipments from Peru during the first quarter of 1959 were nearly four times those of the comparable 1958 quarter.



Tuna, Canned in Brine: Imports for the first three months of 1959 were 32 percent higher than in the same period of 1958. The 1959 quota of canned tuna in brine which may enter the United States at the 12½-percent rate of duty was fixed at 52,372,574 pounds.

Shrimp, Mostly Frozen: Imports continued their upward trend. Receipts from abroad were 60 percent above those of the first quarter of 1958. Mexico was the leading source, shipping 55 percent of the total. Japan, with an impressive gain, followed Panama in quantity of shrimp supplied.

Lobster, Fresh, or Frozen: In the first quarter of 1959, lobster imports from Canada were 35 percent less than in the first quarter of 1958; spiny-lobster imports from other countries were 11 percent greater. Increased spiny-lobster imports from Australia and New Zealand offset decreased imports from the Union of South Africa.

Sea Scallops, Fresh or Frozen: Imports for the first three months of 1959 were double those of the same period of 1958. More than two-thirds of the increase was the result of higher receipts from Japan.

Canned Sardines: With increased shipments from Norway and Portugal, imports of canned in oil for January to March 1959 were 29 percent above those of January to March 1958. Because of greater domestic supplies of canned California sardines not in oil, first quarter imports of that product were much below imports for the first quarter of 1958.

Canned Salmon: During the first quarter of 1959, imports were up 8 percent over the same period of 1958. Japan's share of this trade rose to 94 percent; Canada's share fell to 6 percent.

Canned Crabmeat: January to March 1959 imports were 39 percent above those of the similar period in 1958. Japan supplied almost the entire amount.

Oysters (Mostly Canned): Imports during the first quarter of 1959 were 60 percent above those during the similar period of 1958. As with canned crabmeat, nearly all came from Japan.

Fish Meal: Imports during the first quarter were more than double those of the first quarter of 1958. Receipts from Peru continued at an increased rate thereby making that country the leading foreign source of this product, as it was in 1958. During the first three months of 1959 receipts from Angola and Canada were about twice those of the same period of 1958.

EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1959: Canned Sardines, Not in Oil: Exports for the first quarter of 1959 were a-

bout four times those of the same period of 1958. Due to the improved pilchard catch in the 1958 season, larger supplies of canned California sardines were available for export.

Canned Mackerel and Anchovies: Reduced supplies of these products resulted in lower exports as compared with the same 1958 period, and much lower compared with the same 1957 period.

Canned Salmon: During the first three months of 1959, canned salmon exports were nearly nine times those of the like period of 1958. The primary reason for the increase was exceptionally large shipments (2,131,579 pounds) to the Philippines in March 1959.

Canned Squid: During the first three months of 1959, exports were 74 percent below those of the comparable period of 1958. The Philippines, which has been the main market for this product, imported larger amounts.

Fish Oils, Inedible: Primarily as a result of lower sales to the three leading markets--West Germany, the Netherlands, and Canada--exports of fish oils during the first quarter of 1959 were 29 percent below those of the same period of 1958.

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VALUE OF FISHING TACKLE IMPORTS HIGHEST ON RECORD: United States imports of sport fishing tackle, equipment, and parts in 1958 amounted to \$6,853,403 for an all-time high. This amount represents an 11.5-percent increase over 1957 imports and more than a fourfold increase over 1950, according to the Consumer Durable Goods Division, U. S. Department of Commerce.

Reel imports, which numbered 1,504,453, valued at \$3,593,288, accounted for more than half of the value of all tackle imports. Although 1,070,190 reels from Japan, valued at \$1,067,466, far exceeded imports from any other country numerically, the value of reels from France exceeded those

from Japan by about 47 percent. Imports of French reels in 1958 numbered 294,488 and were valued at \$1,566,334. Japanese reels averaged 99 cents each and French reels \$5.32; however, reels from Western Germany topped the average price of all at \$8.11 each. U.S. imports of West German reels numbered 22,862, and were valued at \$185,431.

Two other classes of imports exceeded \$1 million each and with the reels accounted for almost 90 percent of the year's imports: hooks, other than snelled, \$1,117,269; and the "basket" class including snelled hooks, artificial baits and flies, and fly boxes, \$1,300,825.



Wholesale Prices, May 1959

Wholesale prices from April to May this year showed no significant change over-all, but they were somewhat lower than a year earlier. Prices for fresh salt-water fish were higher in most instances, while processed frozen fishery products prices were lower. Demand was good, but catches were unusually light for this time of year. The May 1959 edible fish and shellfish (fresh, frozen, and canned) wholesale price index (121.7 percent of the 1947-49 average) was only 0.8 percent less than the previous month and 5.4 percent lower than in the same month of 1958.

With lower landings of salt-water fish, especially in the New England area, prices for certain fresh processed fish and shellfish products, like haddock fillets, in May rose above those reported in April, but most prices were lower than a year earlier. On the other hand, fresh-water fish prices in May were lower than in April, when higher prices prevailed because of the Jewish holidays. Since there was a very substantial drop in the landings of haddock at Boston, prices for fresh large drawn haddock rose (27.6 percent) in May, but they were lower (4.6 percent) than for the same month of 1958. With the arrival of fresh halibut on the market in May, prices for that fish were higher (4.8 percent) than in April and just slightly higher than in 1958. Salmon landings continued light in May and prices rose (1.6 percent) above April, but they were significantly lower (3.2 percent) than in the same month of 1958. The May 1959 wholesale price index for the drawn, dressed, and whole finfish subgroup rose 2.5 percent over the

previous month, but was 1.9 percent lower than for the same month of 1958.

Among the fresh processed fish, small haddock fillets reflected the lower haddock landings in New England with prices in May 21.0 percent higher than in April, but 4.2 per-



cent lower than in May 1958. Some improvement in shrimp landings and a slight decrease in demand caused the shrimp prices in May to drop slightly below those in April and dropped 8.9 percent below May 1958. There was almost no change in the fresh processed fish and shellfish subgroup index from April to May this year, but it was 4.4 percent lower than in the same month of 1958.

Improvements in stocks and increased imports of frozen processed fishery products were the causes attributed to the

general drop in prices from April to May, and those prices were also lower than in May 1958. Frozen haddock fillet prices dropped (7.0 percent) from April to May and they were also lower (2.9 percent) than in the same period of 1958. Frozen shrimp prices at Chicago in May were lower (8.2 percent) than in April and 16 percent lower than in May 1958 when prices had reached a rather high level. From April to May 1958, the wholesale price index for processed frozen fish and shellfish dropped 6.4 percent and was 10.7 percent lower than in the same period of 1958.

From April to May there were only slight changes in the prices for canned fishery products, but compared with a year earlier the price changes were more significant. Canned salmon prices were fairly steady with indications that canned

pink salmon prices might strengthen in June. With substantial stocks and in spite of the tuna fleet tie-up on the West Coast, canned tuna prices dropped 1.8 percent from April to May and were 7.3 percent lower than in the same period of 1958. California sardine and Maine sardine prices rose in May. Export sales of California sardines picked up, while the new season for Maine sardines which opened on April 15 had not yet really started because early season landings in Maine were light. Compared to May 1958, when the available stocks were very light, California sardine prices this May were 36.6 percent lower. On the other hand, Maine sardine prices this May were 11.3 percent higher than in May 1958 because of light stocks and a good demand. The over-all canned fishery products subgroup index in May 1958 was 5.5 percent lower than in the same month a year earlier.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1959 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/}		Indexes (1947-49=100)			
			(\$)		May	Apr.	Mar.	May
			May 1959	Apr. 1959	1959	1959	1959	1958
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.7	122.7	128.2	128.6
<u>Fresh & Frozen Fishery Products:</u>					138.1	139.6	148.8	146.0
<u>Drawn, Dressed, or Whole Finfish:</u>					145.5	141.9	153.6	148.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.08	97.0	76.0	149.2	101.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.33	107.0	102.1	103.1	106.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.78	.76	174.1	171.3	168.5	179.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.78	.98	192.1	241.7	166.1	190.9
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.95	1.08	192.1	217.4	161.8	202.2
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.60	.71	140.7	166.5	170.0	111.4
<u>Processed, Fresh (Fish & Shellfish):</u>					136.4	136.5	145.8	142.7
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.35	.29	117.4	97.0	161.6	122.5
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.86	.87	136.7	137.4	143.8	150.1
Oysters, shucked, standards	Norfolk	gal.	5.63	5.75	139.2	142.3	145.4	136.1
<u>Processed, Frozen (Fish & Shellfish):</u>					119.8	128.3	133.9	134.1
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	100.8	103.4	106.0	103.4
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.36	103.6	111.4	124.0	106.7
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.30	112.8	118.8	118.8	118.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.76	.83	117.6	128.1	132.3	140.0
<u>Canned Fishery Products:</u>					98.6	99.0	98.8	104.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . .	Seattle	cs.	22.50	22.50	117.4	117.4	116.1	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.80	11.00	77.9	79.3	79.3	84.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.15	7.00	83.9	82.2	86.9	132.4
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.35	8.22	88.8	87.5	87.5	79.8

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

