

TRENDS AND DEVELOPMENTS

North Pacific Fishery Research Vessels

A fleet of 15 research vessels was sent to sea by fishery agencies along the Pacific Coast during the spring, summer and fall of 1961. This was the largest high-seas research fleet ever mustered in the northeastern Pacific. The work of all vessels was in some way related to high-seas exploitation of salmon, king crabs, and bottom fish in the Bering Sea and North Pacific Ocean.



Fig. 1 - The seiner Marine View and schooner Paragon, two research vessels chartered by the U. S. Bureau of Commercial Fisheries to gill net salmon on the high seas. In port at Adak, Alaska, for net repairs and supplies.

This was the seventh season for the program of the International North Pacific Fisheries Commission (INPFC), representing part of the cooperative effort by Japan, Canada, and the United States. In this operation, the vessels Marine View, Windward, Paragon, and Bertha Ann, under charter to the U. S. Bureau of Commercial Fisheries, carried out studies of salmon and king crab distribution and collected samples for scientific analyses. The first two are purse seiners; the Paragon is a halibut schooner.

The Bertha Ann, a converted military refrigerated cargo carrier, represents an in-

novation. This steel vessel, about 170 feet in length, is able to operate in weather which stops the work of the smaller chartered fishing vessels. The Bertha Ann fishes gill nets and has proven her ability to operate successfully in bad weather. For the first time, winter operations will be possible.

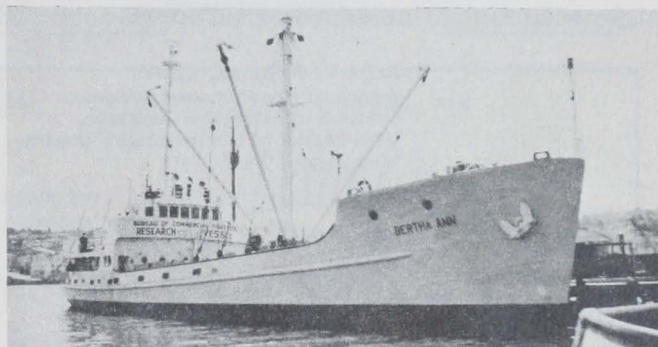


Fig. 2 - M/V Bertha Ann, ready to leave for high-seas experimental gill-net fishing for salmon. The research vessel was chartered by the U. S. Bureau of Commercial Fisheries.

The purse seiners Renown, Commander, Ocean Pride, and Storm, chartered by the Fisheries Research Institute of the University of Washington, tagged salmon to provide information on migrations for the International North Pacific Fisheries Commission. Part of the INPFC program was to operate Japanese-type long lines for salmon from the Fort Ross, under charter to the Fisheries Research Board of Canada. Fish captured by this method have been successfully tagged by Japanese scientists. The Canadians brought an expert long-line fisherman from Japan to supervise operations on the Fort Ross.

Another innovation in 1961 was the trawling survey in the Gulf of Alaska. This was to determine whether bottom fishing, which may be carried out by Japan and Russia, will affect halibut resources fished by Canada and the United States. In this operation the purse seiners Arthur H., Victory Maid, Morning Star, and St. Michael were operated by the International Pacific Halibut Commission.

In addition, the Bureau of Commercial Fisheries chartered the halibut schooner Tordenskjold and operated its own exploratory fishing vessel, the John N. Cobb. Together these six vessels trawled over a broad area of bottom in the Gulf of Alaska extending roughly from the Shumagin Islands to Cape Spencer.

The 15-vessel fleet worked at points on the high seas from Cape Spencer almost to the end of the Aleutian Chain. Information essential to rational exploitation of the high-seas fisheries can be gathered only by going to sea. Information obtained by this seagoing scientific research will be invaluable in assessing the potential of traditional North American fishery resources and the adverse effects upon that resource of the growing high-seas fisheries of other nations.

--Ralph P. Silliman, Chief
Branch of Anadromous Fisheries,
Division of Biological Research,
U.S. Bureau of Commercial Fisheries,
Washington, D. C.



California

SHRIMP LANDINGS IN 1961 EXCEEDED 2 MILLION POUNDS:

California ocean shrimp landings for the 1961 season that ended October 31 totaled 2,006,274 pounds, slightly less than the 1960 record catch of 2,011,826 pounds, California's Department of Fish and Game reported on November 22, 1961.

The 1961 landings were composed of 1,206,847 pounds from the Crescent City area and 799,427 pounds from the Fort Bragg area. Compared with 1960, Crescent City landings were down 121,562 pounds but Fort Bragg landings were up 268,666 pounds.

No shrimp were landed in 1961 at either Bodega Bay or Morro Bay, where early season explorations showed the shrimp populations were scattered.

California's ocean shrimp fishery, established in 1952 following exploratory work by marine biologists of the Department of Fish and Game, has risen steadily to the two-million-pound annual total from the 1952 total of 205,485 pounds. The annual production is controlled by a State-imposed total quota.

However, this quota has not been a limiting factor to date.

* * * * *

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 61-N-15a & b-Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued (Sept. 5-8, 19-22, 1961) in the Carquinez Strait, Point San Pedro, and Half Moon Bay areas to (1) capture marked salmon fingerlings on their seaward migration; and (2) determine areas in the ocean where salmon fingerlings may be captured. A cotton midwater trawl with 15-foot opening and nylon midwater trawl with 25-foot opening were used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3:30 p.m. and each tow was for 20 minutes. Surface tows were alternated between upstream and downstream and between the north shore, center, and south shore of the channel. A flow meter was used to measure the amount of water strained by the net on each tow.

A total of 64 tows was completed in the Strait during this cruise yielding a catch of 10 king salmon (Oncorhynchus tshawytscha) fingerlings, none of which was marked. No rainbow trout (Salmo gairdneri) were captured.

Five deep trawls were made in the Strait to (1) determine if king salmon were migrating downstream in deeper water; (2) to test the performance of the new 25-foot nylon midwater trawl below the surface; and (3) to collect additional samples of an unidentified species of shrimp occurring in the Strait and Delta waters. No salmon were captured during the deep trawling tows. The net performed satisfactorily below the surface, and the species of shrimp sought was collected, although in smaller numbers than observed earlier in the year.

Other species appearing in the catch, listed in order of abundance, were northern anchovy (Engraulis mordax), striped bass (Roccus saxatilis), American shad (Alosa sapidissima), Pacific herring (Clupea pallasii), shrimp (Palaemon sp.), jack smelt (Atherinopsis californiensis), top smelt (Atherinops affinis), starry flounder (Platichthys stellatus), north-

ern midshipman (Porichthys notatus), and white sturgeon (Acipenser transmontanus).

The 25-foot nylon midwater trawl was used in an attempt to capture salmonfingerlings in ocean waters off Half Moon Bay. No salmon were taken in four trawls in that area.

Note: Also see Commercial Fisheries Review, Nov. 1961 p. 15.

* * * * *

ROCKFISH TAGGING CRUISE IN MONTEREY-SAN SIMEON INSHORE WATERS:

M/V "Nautilus" 61-N-16-Rockfish: The California Department of Fish and Game research vessel Nautilus cruised the inshore waters from Monterey to San Simeon, Calif., to (1) experiment with a mid-depth trawl in capturing blue rockfish, Sebastes mystinus; (2) capture blue rockfish by hook and line for tagging and for stomach and scale samples; and (3) make collections of other species of rockfish for taxonomic purposes.

Four 20-minute tows were made with a mid-water trawl having a 15-foot-square opening. It was towed at depths ranging from 20 to 70 feet and at speeds of 2 to 5 knots. No blue rockfish were captured even when the net was towed through areas where hook-and-line angling indicated their presence. Only one fish, an electric ray (Torpedo californica), was taken in the net. Jellyfish formed the bulk of the catch. Several salps were noted.

In all, 868 blue rockfish were tagged. Most required decompression, i.e., removal of air from the air bladder to equal surface pressure. All were anesthetized in a 1/15,000 solution of M.S. 222. Only a few required repositioning of the stomach, i.e. pushing the stomach back into place with a plastic rod through the mouth. The fish were caught from the surface to over 100 feet.

The purpose of the tagging program is to determine whether the blue rockfish entering the sport fishery off central and northern California are from one intermingling population or from separate sub-populations.

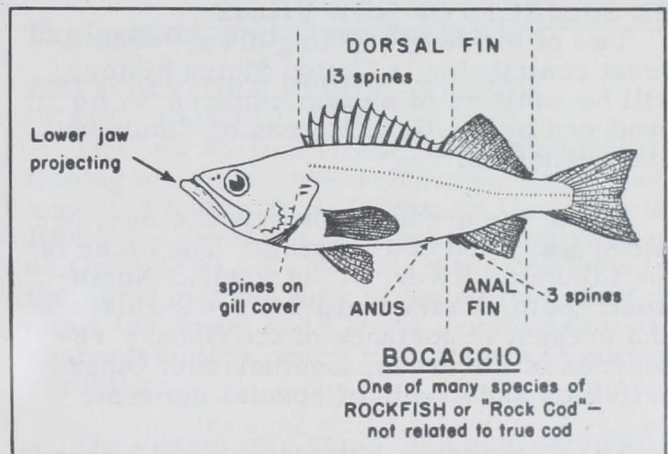
Stomachs and scales were collected from 66 specimens and, in addition, stomachs were obtained from 13 lingcod (Ophiodon elongatus).

The next most frequent fish caught was the olive rockfish (S. serranoides). Large concentrations were encountered in about 25 fathoms west of Pt. Sur.

Unusually large concentrations of lingcod hampered tagging operations off Point Piedras Blancas and northwest of Cape San Martin.

Copper rockfish (Sebastes caurinus), canary rockfish (S. pinniger), gopher rockfish (S. carnatus), and yellowtail rockfish (S. flavidus) were collected for taxonomic studies.

Other fish caught by hook and line included vermilion rockfish (S. miniatus), turkey-red rockfish (S. ruberrimus), starry rockfish (S. constellatus), rosy rockfish (S. rosaceus), China rockfish (S. nebulosus),



bocaccio (S. paucispinis), black rockfish (S. melanops), cabezon (Scorpaenichthys marmoratus), jack mackerel (Trachurus symmetricus), Pacific mackerel (Pneumatophorus diego), Pacific sand dab (Citharichthys sordidus), and rock sole (Lepidopsetta bilineata).



Cans--Shipments for Fishery Products, January-September 1961

Total shipments of metal cans during January-September 1961 amounted to 98,535 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 97,915 tons in the same

period of 1960. Canning of fishery products in January-September this year was confined largely to tuna, jack mackerel, Pacific salmon, and Maine sardines. Although the packs of shrimp and Maine and California sardines were down, greater



packs of tuna and salmon more than offset those declines.

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



Films

TWO HISTORIC FISHERY AREAS TO BE SUBJECTS OF NEW FILMS:

Two of the finest fishing areas, each a great contributor to United States history, will be subjects of motion pictures to be produced by the U. S. Bureau of Commercial Fisheries.

One of the areas is Chesapeake Bay, between Maryland and Virginia. The other is the Columbia River, in the Pacific Northwest. Both pictures will feature the historic and present importance of the fishery resources of the areas, together with other activities and events of special interest.

The Chesapeake Bay picture will be made by ACI Productions, New York City. It will be a 16 mm. sound-color film approximately 28 minutes long. The States of Maryland and Virginia are cooperating with the Bureau in sponsoring the film. Production will be under the direction of the Bureau. Since fishery activities are to be shown for all seasons, the picture will be about a year in the making.

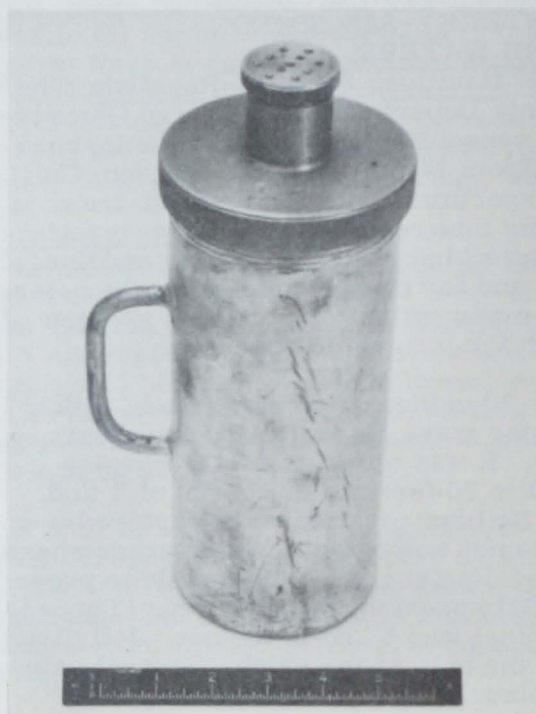
The Columbia River picture will be made by the Motion Picture Division of Walter J. Klein Company, Charlotte, N. C. It also will be a 28-minute, 61 mm. sound-color film. It will be an educational and documentary picture of the commercial fisheries of the Columbia River, featuring the salmon fishery, dams, spillways, electric generators, fishways, and modern hatcheries and laboratories. This film likewise will be a year in production in order to depict the ever-changing salmon activities in the River.



Gear

DEVICE FOR RECORDING NET DEPTH:

An instrument which graphically records depth as a function of time has been developed by the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, Calif. The device was designed for use on tuna purse seines. However, it should be readily adaptable for gill nets and other applications where instantaneous telemetered depth information is not required.



Device for recording depth.

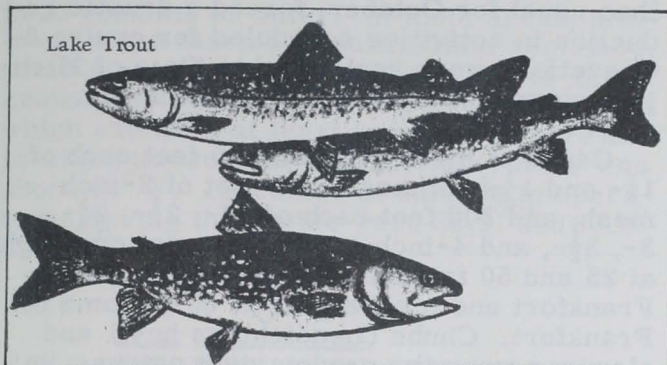
The pressure-sensing device is an "O" ring sealed, spring loaded, piston available in various diameters depending upon the maximum anticipated depth. The recording paper is attached to a drum which is rotated by a clock. The device is made of aluminum, is less than 21 inches long and of near neutral buoyancy. It is rugged enough to survive riding the lead line of a purse seine while the net is being set. The clock starts automatically upon submersion.



Great Lakes

JOINT EFFORTS TO BRING BACK LAKE TROUT TO UPPER GREAT LAKES:

Joint efforts under way to bring lake trout back to the upper Great Lakes gained more momentum in October 1961



Lake Trout

when some 4,120,000 green lake trout eggs were taken from brood stock at the Michigan Conservation Department's Marquette hatchery. About 100,000 of the eggs will be hatched and reared for plantings in Michigan's inland lakes.

Yearling trout to be raised from the remaining bulk of eggs are scheduled for release in Lakes Michigan, Huron, and Superior in 1963 under a massive program of lamprey control and fish restoration coordinated by the Great Lakes Fishery Commission (GLFC), the Michigan Department of Conservation reported early in November 1961.

The GLFC, made up of conservation officials from Ontario, the United States Government, and Great Lakes States, has set an annual planting goal of 7 million yearling lake trout in the upper Great Lakes as soon as lampreys are brought under control.

The U. S. Bureau of Commercial Fisheries completed the first series of chemical attacks on lampreys in Lake Superior streams in November 1960. It will continue to operate electrical weir barriers through 1962 on major lamprey-producing streams to measure results of treating and to capture adult lampreys that went into Lake Superior before the streams were treated.

The Bureau hopes to complete the first round of treatment in all lamprey streams tributary to Lakes Michigan and Huron within the next four years.

The October 1961 spawn take at Marquette hatchery is the highest made there since 1959 when plantings were launched experimentally under the lake trout rehabilitation program. Just two years earlier, only 950,000 eggs were collected at the hatchery. In 1960, the hatchery's output rose to 2,450,580 eggs.

Michigan Department fisheries officials report the hatchery's brood stock has built up to a point where it is no longer necessary to net inland lakes for spawn to meet needs of the Great Lakes planting program. Six inland lakes were netted in recent years for egg collection, but efforts in those waters proved uneconomical as compared with spawn-taking operations at the hatchery.

Some 39,000 lake trout were planted in eight lakes of Michigan's northern lower peninsula in the fall of 1961, the Michigan Conservation Department reported. The plantings were made up of two-year-olds averaging seven inches in length.

The U. S. Bureau of Commercial Fisheries reported that its chemical attack against lampreys in East Bay at Grand Marais, Alger County, Michigan, was completed early in November 1961, but results of the highly-potent treatment are not yet fully known.

Some of the lamprey larvae were still alive in test cages set out in the Bay. A relatively small number of game fish was killed by the treatment. Between 50 and 80 rainbow trout, a low number of northern pike, and some perch were killed. Mortality was highest among suckers and minnows.

Federal fisheries men netted the Bay prior to treatment in an effort to salvage as many game fish as possible.

Samples of the Bay's bottom soil will be taken to help determine how hard lamprey larvae were hit in the Bay and its connecting channel by a concentrated solution of toxaphene which was pumped into the waters for two weeks early in November.

The Bureau continued to conduct netting work between the east and west bays to study effects of the treatment. An electric beam trawl will be used in spring 1962 to further size up the lamprey larvae situation.

As in the case of actual treatment, studies will be complicated by the large body of water involved. Previously, the chemical war on lampreys has been waged only in streams.

Treatment of the Bay was approved by Michigan's Conservation Department Director following a public hearing held in Munising in which plans for the project were outlined and favorably received by local residents.



Great Lakes Fisheries

Exploration and Gear Research

EXPLORATORY FISHING VESSEL "KAHO" COMPLETED:

The new 65-foot Great Lakes exploratory fishing and gear research vessel Kaho was accepted by the U. S. Bureau of Commercial Fisheries from the construction contractor on October 31. Trial runs were conducted the same day and they revealed that the Kaho has a top speed of 12 knots, comfortable sea characteristics, and a high degree of maneuverability.

The vessel was completed approximately 5½ months after the contract for construction was awarded.

After a series of shakedown runs in Lake Erie to familiarize vessel personnel with operational characteristics and equipment, the Kaho left her base at Saugatuck, Mich., on November 16, 1961. The first of two trawl exploration cruises, scheduled for Lake Michigan during the remainder of 1961, was started on November 27, 1961.



Great Lakes Fishery Investigations

LAKE ERIE STUDIES TO DETERMINE LENGTH AND AGE OF FISH AT END OF GROWING SEASON, OCTOBER 1961:

Vessel operations for October 1961 were confined to the fall 3 day-night series of trawl hauls at Stations 49 (Bono) and 4 (East

Harbor) and to the biweekly visits at Station 5 (Sandusky Bay). Major emphasis was on the determination of the average lengths of fish of different species and ages at the end of the growing season.

During the 3 day-night trawling series (which duplicated similar spring and summer series), two 10-minute tows were made at each of 3 depths, during the morning, afternoon, and evening (total of 54 tows at each station). Data from collections during the 3 seasonal series will be tabulated to provide information on the relative abundance, distribution, and periodic growth of the more prominent species and age groups during 1961.

More fish were taken at Bono than at East Harbor during the fall series, primarily because of a greater abundance of yearling and 2-year-old yellow perch at Bono. Catches of young-of-year fish were somewhat sporadic in both areas although yellow perch, white bass, alewives, and spot-tail shiners were caught rather consistently. With the cooling of water temperatures, smelt of all age groups have again returned to the western basin and were taken in varying numbers. Only 14 young-of-year yellow pike or wall-eyes, averaging 8.7 inches in length, were collected at the two stations.

Trawling in Sandusky Bay produced good catches both in numbers and variety. The average number of fish caught per tow was 505, of which about 75 percent were young-of-the-year. Young-of-year channel catfish were especially well represented.

Surface water temperatures in the western basin decreased from 66° to 57° F. between October 10 and October 27. Completion of the fall overturn early in the month brought a return to normal dissolved-oxygen conditions in the deeper areas of the central basin.

The semiannual collection of scale samples from major species in the commercial catch was resumed in late October at Ohio ports. Other collections were to be made at Wheatley, Ontario; Erie, Pa.; and Dunkirk, N. Y.

* * * * *

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 8, October 10-24, 1961: Strong winds, even more persistent

than usual for October, forced a drastic reduction in activities scheduled for cruise 8. Operations were restricted to State of Michigan waters of northern Lake Michigan.

Gangs of nylon gill nets (50 feet each of 1¼- and 1½-inch mesh, 100 feet of 2-inch mesh, and 300 feet each of 2¾-, 2½-, 2¼-, 3-, 3½-, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Charlevoix and Frankfort and for 2 nights at 80 fathoms off Frankfort. Chubs (*Leucichthys hoyi*) and alewives were the predominant catches in the Charlevoix area. Chubs at 50 fathoms and alewives at 25 fathoms. A number of smelts and a few yellow perch, white sucker, and other species of chubs were also caught. In the Frankfort area, catches consisted of nearly all chubs (*L. hoyi*) at 25, 50, and 80 fathoms.

The vastly different catches between each 25-fathom set made in the Charlevoix and Frankfort areas may be explained by the great difference in thermal conditions in the areas in which the nets were set. Off Charlevoix the water was homothermous at about 60° F. from top to bottom; this accounted for the catch of yellow perch and white suckers which prefer warm water and the near absence of chubs, and may also have contributed to the large alewife catch. Off Frankfort the thermocline was distinct and the bottom temperature of about 40° F. was more favorable for chubs.

In half-hour bottom tows with a 50-foot balloon trawl at 15, 25, 35, and 50 fathoms off Frankfort, chub catches were 0, 477, 292, and 452 pounds, respectively. All hauls caught alewives (up to 57 pounds at 50 fathoms), and the 50-fathom tow took 190 pounds of deep-water sculpins. The 15-fathom tow caught only a few pounds of alewives and smelt (mostly young of the year) and 5 yellow perch. (The average length of the young of both smelt and alewives was about 2.5 inches.) A 30-fathom tow in Little Traverse Bay (east of Charlevoix) took only 20 pounds of chubs and a few smelt and alewives.

Limnological collections and observations were made at 40-fathom stations off Charlevoix and Frankfort, and at 40 fathoms in mid-lake between Charlevoix and Manistique. Thermal conditions in the lake were very unstable, as high winds resulted in the movement of large water masses. Homothermous conditions from surface to bottom as low as 40° F. and as high as 60° F. were observed

in 25 fathoms of water. In most areas, however, some thermal stratification remained. After a northeast gale near the end of the cruise, an upwelling developed off Frankfort which extended at least 5 miles offshore and in which the surface water temperature was about 40° F. Extremes of surface temperatures during the cruise were 39.2° and 60.8° F. (4.0° and 16.2° C.).

* * * * *

FALL DISTRIBUTION OF FISH IN LAKE SUPERIOR STUDIED:

M/V "Siscowet" Cruise 7: Fall environmental conditions were studied at 3 limnological stations in the Apostle Islands region of Lake Superior--southeast of Stockton Island, northeast of Bear Island, and east of Pike's Bay--September 12-October 2, 1961. Limnological collections included records of water temperature, Secchi-disc readings, water samples for chemical analyses, and bottom and plankton samples. The water was nearly homothermous at all depths above 20 fathoms. Temperatures ranged largely between 50° and 55° F; this represented about a 10-degree increase in bottom temperatures and nearly a 15-degree decrease in surface temperatures since midsummer. Fishery studies included the collection of information on the fall distribution of whitefish, lake herring, and chubs, and on the distribution, survival, and growth of hatchery-reared lake trout. Experimental fishing gear was operated at the following locations: east of Gull Island; Punky Bay; Frog Bay; southeast of Michigan Island; southeast of Stockton Island; Pike's Bay; east of Basswood Island; southeast of Oak Island; west of Ironwood Island; northeast of Cat Island; and west of Outer Island.

In an attempt to locate small, immature lake herring, a gang of 4 gill nets (1 $\frac{1}{4}$ -, 1 $\frac{1}{2}$ -, 2-, and 2 $\frac{1}{4}$ -inch mesh) was suspended 30 feet below the surface in water 14 to 44 fathoms deep at the Gull and Michigan Island stations. The catch from 3 sets was 156 lake herring (37 immature), 17 chubs, 9 smelt, and 1 sculpin.

A standard gang of gill nets (1- to 5-inch mesh) set at 25 fathoms southeast of Stockton Island caught 383 bloaters and smaller numbers of smelt, burbot, whitefish, lake herring, and lake trout.

Trawl tows in the Apostle Islands region at depths ranging from 12 to 30 fathoms

yielded, in addition to lake trout, generally small numbers of smelt, chubs, sticklebacks, and sculpins. Unusual catches from single 15-minute tows were: 519 smelt in Pike's Bay; 278 bloaters in Frog Bay; and 30 yearling alewives northeast of Cat Island.

To date the Siscowet captured 141 small lake trout (excluding yearlings) in the Apostle Islands region; 124 (88 percent) were fin-clipped and 92 (74 percent) of the hatchery-reared fish were from the 1960 Bayfield plant (average increase in length since planting in June 1960--3.1 inches).

During the cruise the Siscowet recaptured 150 yearling lake trout representing 3 stocks planted in close proximity among the Apostle Islands by the Wisconsin Conservation Department in June 1961.

Although the total number of recoveries is too small to permit definite conclusions, these early returns suggest a relatively better survival of the lake trout reared at Pendills Creek than of the fish reared at Bayfield. The growth of 0.8 and 0.7 inch for the lake trout reared at Bayfield and Pendills Creek is closely comparable to the growth (0.7 inch) observed in August for the lake trout from the 1961 Keweenaw Bay plant.

* * * * *

LAKE TROUT SPAWNING POPULATIONS ASSESSED IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR:

M/V "Siscowet" Cruise 8: The annual assessment of spawning populations of lake trout in the Apostle Islands region of Lake Superior was made October 16 to 22, 1961. A total of 34,800 feet of large-mesh gill nets (32,400 feet of 6-inch mesh and 2,400 feet of 5-inch mesh) were fished at depths of 3 $\frac{1}{2}$ to 12 fathoms on Gull Island Shoal, between Michigan and Gull Island, and just east of Michigan Island. Only 17 lake trout were captured, all of which were ripe males. The fish ranged in length from 20.2 to 30.2 inches (average, 25.1 inches); 8 of the trout bore healed lamprey scars but none had fresh scars. Eleven of the trout were tagged and released. (The Wisconsin Conservation Department's research vessel Salmo fished 32,000 feet of 5- and 6-inch mesh gill nets on other lake trout spawning grounds--off Rocky, Manitou, Ironwood, Cat, and Stockton Islands--with similar results. Fifteen ripe male lake trout, but no females were

caught; no fresh lamprey scars were observed.)

Small-mesh gill nets (150 feet each of 1½- and 2½-inch mesh) which were fished with the large-mesh nets on Gull Island Shoals caught 298 longnose suckers, 27 lake herring, 18 round whitefish, 2 burbot, and 1 yellow perch. No fish eggs were found in the stomachs of about 50 suckers which were examined.

Ages were determined for 29 of the lake trout captured by the research vessels Salmo and Siscowet. The number of fish in each of 5 age groups which were represented was: V, 8; VI, 17; VII, 2; VIII, 1; and IX, 1.

Water temperatures on the lake trout spawning reefs ranged from 47.5° F. to 50.4° F.



Gulf Exploratory Fishery Program

UNDERWATER OBSERVATIONS OF SHRIMP TRAWLS IN ACTION CONTINUED:

M/V "George M. Bowers" Cruise 35 (October 12-22, 1961): Underwater observations of shrimp trawls in action were continued in the Gulf of Mexico by the George M. Bowers, exploratory fishing vessel of the U. S. Bureau of Commercial Fisheries. Measurements of a 40-foot four-seam semi-balloon shrimp trawl were obtained with 4 door sizes (5 foot, 6 foot, 7 foot, and 8 foot) at various speeds and scope ratios.

The configuration of this design was measured for trawls constructed from cotton as well as from nylon webbing. These measurements and strain measurements of the various components of the trawling assembly are to be made also of the other basic shrimp trawl designs.

Observations and movies of a shrimp trawl operating on loggerhead sponge and coral bottom were made in the Carabelle (Florida) area.

Data collected during this and previous cruises concerning underwater observations of shrimp trawls in action are being analyzed at the Bureau's Exploratory Fishing and Gear Research Base, Pascagoula, Miss.

Note: See Commercial Fisheries Review, Dec. 1961 p. 32.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-9: A series of 12 tows of 3 hours each equally divided between two statistical areas and depth ranges were made with a 45-foot shrimp trawl by the U. S. Bureau of Commercial Fisheries chartered research vessel Belle of Texas operating from the Bureau's Biological Laboratory in Galveston, Tex., during November 7-10, 1961. The results were nearly negative with only small quantities caught in both statistical areas. In one statistical area (F&WS Grid Zone 15) for each 3-hour tow in the depth range up to 25 fathoms only 22 pounds (heads-on) of shrimp were caught; only 8 pounds were caught in the depth range of 25-60 fathoms. The size caught in the the depth range up to 25 fathoms was 21-25 count heads-off, almost evenly divided between white and brown. In the depth range of 25-60 fathoms, the size was 15-20 count heads-off, all brown.

In the second statistical area (Grid Zone 16), in the depth range up to 25 fathoms only 13 pounds (heads on) of shrimp were caught, almost equally divided between white and brown, per 3-hour tow. The size of the brown shrimp was 26-30 count (heads off) and the size of the white was 21-25 count. In the 25-60 fathom range in the second statistical area, only 18 pounds of brown shrimp were caught, 12-15 count (heads off).

M/V "Belle of Texas" Cruise BT-10 (November 15-17, 1961): The M/V Belle of Texas made another series of six tows equally divided between two statistical areas and two tows in each depth range with a 45-foot shrimp trawl. In the first (Grid Zone 19) of the two statistical areas covered, only 17 pounds of shrimp (heads on) were caught in the depth range up to 20 fathoms, mostly brown shrimp 26-30 count (heads off). In the 20-40 fathom range 66 pounds of brown shrimp were caught, 21-25 count. In the 40-60 fathom range, only 3 pounds of brown shrimp were caught, 21-25 count.

In the second (Grid Zone 20) of the two statistical areas, 120 pounds of shrimp were caught in the depth range up to 20 fathoms, mostly white shrimp 21-25 count. Only 1

pound of brown shrimp 21-25 count was caught in the 20-40 fathom zone; and 27 pounds of 15-20 count brown shrimp were caught in the 40-60 fathom range.

Note: See Commercial Fisheries Review, December 1961 p. 32.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-OCTOBER 1961:

Landings of skipjack tuna in Hawaii during October 1961 were about 530,000 pounds, or about 130,000 pounds below the 1948-60 average landings for the month.

Length measurements in October showed little change in size composition of the catch from that observed during the latter part of September. Modal groups were centered around 48 cm., 63 cm., and 79 cm. (5.0, 12.5, and 26.9 pounds, respectively), with the 63 cm. mode dominant. Partial gross receipts show a similar picture, with the sizes less than 8 pounds, 8-15 pounds, and over 15 pounds making up 22 percent, 37 percent, and 41 percent of the landings, respectively.

Total estimated landings for January-October 1961 were 10.9 million pounds. On this basis, it was estimated that total landings for the year would be about 11 and 12 million pounds (compared with an average of 10 million pounds).

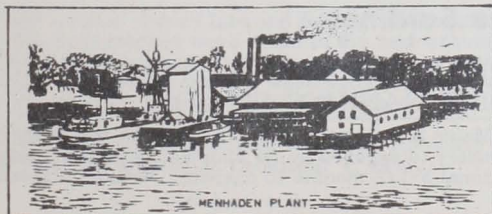


Industrial Products

U. S. FISH MEAL, OIL, AND SOLUBLES PRODUCTION, JANUARY-OCTOBER 1961:

The production of meal and oil during October 1961 was less than October 1960. However, the quantity processed during January through October 1961 was greater than during the same period of last year.

During October 1961, fish meal production amounted to 16,900 tons--81 percent from menhaden; fish solubles and homogenized fish amounted to 8,400 tons; and the production of marine-animal oils totaled 1.9 million gallons--90 per-



cent from menhaden. Compared with October 1960, the meal production was down 30 percent, and marine animal oil dropped 37 percent.

The quantity of fish meal processed during the first 10 months of 1961 amounted to 265,500 tons--8,300 tons above the same period of the previous year. Fish solubles and homogenized fish production totaled 100,000 tons--7,500 tons greater than the 10-month period of 1960. Production of marine-animal oils during the first 10 months of 1961 amounted to 30.5 million gallons--5.3 million gallons above the same period last year.

Imports of fish meal during January through September 1961 (159,100 tons) were 64 percent more than during the same period of 1960, while imports of fish solubles (2,500 tons) were 11 percent below the 1960 9-months total. Exports of fish oils and fish-liver oils during the 9-month period of 1961 of 95.4 million pounds (12.7 million gallons) dropped 13.4 million pounds or 1.8 million gallons compared with the same period of 1960.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, January-October 1961

Product	Jan.-Oct.		Total
	1961	1960	1960
.....(Tons).....			
<u>Fish meal and scrap:</u>			
Alewife	89	1,092	1,092
<u>Herring:</u>			
Alaska	3,576	6,103	6,103
Maine	1,050	2,612	2,915
Menhaden 1/.....	230,486	204,184	218,423
Sardine, Pacific	2/ 1,397	2,331	3,301
Tuna and mackerel	2/ 17,191	22,582	26,325
Unclassified.....	11,708	18,288	21,279
Total	265,497	257,192	279,438
Shellfish and marine animal meal and scrap	3/	3/	10,309
Grand total meal and scrap	3/	3/	289,747
Fish solubles	89,534	83,111	89,377
Homogenized condensed fish	10,487	9,397	9,552
.....(Gallons).....			
<u>Oil, body:</u>			
Alewife	6,900	66,121	66,121
<u>Herring:</u>			
Alaska	625,786	1,385,218	1,385,218
Maine	4/	130,293	132,973
Menhaden 1/.....	28,237,949	21,981,419	24,453,736
Sardine, Pacific	2/ 37,243	123,427	143,654
Tuna and mackerel	2/586,860	413,846	507,180
Other (including whale) ...	1,026,866	1,088,092	1,137,527
Total oil	30,521,604	25,188,416	27,826,409

1/Includes a small quantity produced from thread herring.
 2/Data furnished by the California Department of Fish and Game, Marine Resources Operations.
 3/Not available on a monthly basis.
 4/Included in "other" in order to avoid disclosure of the production of individual firms.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1961: Based on domestic production and imports, the United States supply of fish meal for the first 9 months of 1961 amounted to 408,000 tons--77,000 tons above the same period of 1960. Domestic production was 15,000 tons and imports 62,000 tons greater than for the same period in 1960. Peru continued to lead other countries as the principal source of imports with shipments totaling nearly 105,000 tons during the first 9 months of 1961.

All factors indicate that the total United States supply of fish meal in 1961 will exceed the peak year of 1959 when the quantity amounted to nearly 440,000 tons.

Item	January-September		Total 1960
	1961	1960	
 (Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	216,834	183,849	218,423
Tuna and mackerel	15,416	20,705	26,499
Herring, Alaska	3,576	6,103	6,103
Other	12,819	22,443	39,112
Total production	1/248,645	1/233,100	290,137
Imports:			
Canada	31,194	27,546	30,982
Peru	104,522	51,093	68,156
Chile	10,078	12,148	21,183
Angola	1,543	360	888
Republic of South Africa	10,526	5,829	7,073
Other countries	1,277	357	3,279
Total imports	159,140	97,333	131,561
Available fish meal supply	407,785	330,433	421,698
Fish Solubles:			
Domestic production ^{2/}	91,603	85,316	98,929
Imports:			
Canada	859	809	869
Denmark	28	1,858	1,858
Other countries	1,621	165	447
Total imports	2,508	2,832	3,174
Available fish solubles supply	94,111	88,148	102,103

1/Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.
2/50 percent solids. Includes production of homogenized-condensed fish.

The United States supply of fish solubles, including homogenized fish, during January-September 1961 totaled 94,000 tons--6,000 tons more than during the same period in 1960. Solubles and homogenized fish manufactured from domestically-caught fish accounted for nearly all of the supply. Only 3 percent of the supply was imported during the first 9 months of 1961.

MAJOR INDICATORS FOR U. S. FISH MEAL, SOLUBLES, AND OIL, NOVEMBER 15, 1961:

Item and Period	1961	1960	1959	1958
 (Short Tons)			
Production:				
November	1/	8,725	10,797	9,749
October	14,100	24,455	22,026	11,630
January-October 2/ ..	262,745	242,486	250,218	189,230
Jan.-December Totals	1/	290,137	306,551	248,140
Imports:				
November	1/	6,149	3,673	6,082
October	1/	12,515	3,821	5,899
September	13,941	9,487	9,224	5,079
January-September ..	159,140	97,333	119,923	79,881
Jan.-December Totals	1/	131,561	132,925	100,352

Item and Period	1961	1960	1959	1958
 (Short Tons)			
Production ^{3/} :				
November	1/	3,524	4,628	8,888
October	7,400	7,192	12,487	8,867
January-October	99,000	92,508	155,302	114,984
Jan.-December Totals	1/	98,929	165,359	130,177
Imports:				
November	1/	282	3,089	867
October	1/	-	1,908	2,548
September	263	38	1,732	253
January-September ..	2,508	2,832	21,213	5,972
Jan.-December Totals	1/	3,174	26,630	14,567

Item and Period	1961	1960	1959	1958
 (1,000 Gallons)			
Production:				
November	1/	1,202	1,147	1,028
October	1,700	3,024	2,176	1,139
January-October 4/ ..	30,320	24,385	21,352	18,555
Jan.-December Totals	1/	27,879	24,978	22,028
Exports:				
November	1/	1,952	813	2,037
October	1/	591	1,911	3,591
September	1,269	1,861	1,129	665
January-September ..	12,717	14,504	13,929	6,528
Jan.-December Totals	1/	19,155	19,264	12,539

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



Maine Sardines

MAINE LEGISLATURE EXTENDS SARDINE CANNING SEASON:

The Maine State Legislature has granted the Maine sardine industry (staggered by its shortest pack in 23 years) an additional 5-1/2 months to operate. Without a dissent-

ing vote, the Legislature in a Special Session early in December 1961, authorized canning on a year-around basis until January 1, 1963, when the legal sardine canning season will automatically revert back to an April 15 opening and December 1 closing.

The total pack to December 1 was approximately 679,000 cases against 1,970,000 cases for the 1960 season, and an average of well over 2 million cases for the past 15 years. The last critically short pack which occurred in 1938 totaled 659,000 cases.

Although there was considerable industry opposition to any extension, the legislators agreed with the proponents that canning operations should be continued through the winter to provide much needed employment in coastal towns and to protect the industry's nationwide distribution and consumer purchase patterns.

Opponents based their arguments on conservation and the difficulties of obtaining fish as well as the winterizing and operation of plants on a profitable basis.

Two bills were considered, one to extend the season for a month for 1961 only and the other to permit year-around canning for two years. After a four-hour public hearing, the Committee unanimously voted for the compromise.

No official count is yet available but it is expected that at least a dozen of the industry's 31 plants will operate, with more held in readiness to open if the fish supply is adequate.

During the war years, 1942-46, year-around canning was permitted as an emergency measure and the average winter pack was about 325,000 cases with 550,000 produced in 1955.

However, as the proponents pointed out at the legislative hearing, the methods of finding and taking fish are now much more advanced and they believe that this will assure greater supplies of raw material.

Although no clear-cut explanation of the 1961 shortage of fish has been given, U. S. Bureau of Commercial Fisheries scientists see a possible clue in the fact that there has been a shift in the ocean currents in the Gulf of Maine. They state that this is a common occurrence and usually of a temporary nature that corrects itself in a matter of a few weeks or months.

The scientists have been unable to find any biological reasons and therefore they see no indication that the shortage should continue through 1962. A further optimistic note is that the 1938 shortage was followed by a banner year in 1939 and for 20 years thereafter except for a few minor fluctuations.

There appeared to be plenty of fish offshore all season but they did not come in to areas where they could be taken, which is another reason why the scientists believe it was a matter of distribution rather than of supply.

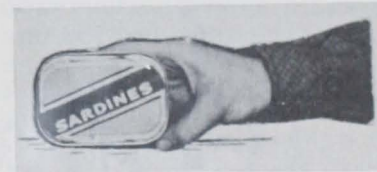
CANNED STOCKS, NOVEMBER 1, 1961:

Distributors' stocks of Maine sardines totaled 202,000 actual cases on November 1, 1961, a drop of 75,000 cases or 27 percent from the 277,000 cases on hand on November 1, 1960. Stocks held by distributors on July 1, 1961, amounted to 208,000 cases, and on June 1, 1961, totaled 215,000 cases, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on November 1, 1961, totaled only 221,000 standard cases (100 3/4-oz. cans), a drop of 1.0 million cases (82 percent) as compared with November 1, 1960. Stocks held by canners on July 1, 1961, totaled 201,000 cases and on June 1, 1961, totaled 294,000 cases.

The low level of current stocks reflects one of the shortest packs of Maine sardines in recent years. The total pack to December 1, 1961, was 679,000 standard cases. In the same period of 1960 the pack was 1,970,000 cases.

At the beginning of the 1961 packing season on April 1, the carryover at the canners' level was about



457,000 standard cases. Adding the pack of 630,000 cases as of November 1, 1961, results in a total

supply of 1,087,000 cases as of that date-- 1,196,000 cases less than the supply of 2,283,000 cases reported on November 1, 1960. The short pack has affected shipments, which amounted to 409,000 cases from April 1-November 1, 1961, as compared to 1,025,000 cases in the same period of 1960.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1961, with Comparisons^{1/}

Type	Unit	1961/62 Season		1960/61 Season				1959/60 Season				
		11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60	7/1/60	6/1/60	4/1/60	1/1/60	11/1/59
Distributors	1,000 actual cases	202	208	215	267	233	277	172	197	252	235	296
Canners . .	1,000 std. cases ^{2/}	221	201	294	506	1,029	1,258	359	235	397	843	1,001

^{1/}Table represents marketing season from November 1-October 31.
^{2/}100 3/4-oz. cans equal one standard case.

The 1961 season opened late and fishing was consistently spotty. The best catches were made in the mid-coastal areas while the season was almost a complete bust in the traditionally active Hancock and Washington County waters and not much better in the western or Portland area.

Canners' inventories of canned Maine sardines were reported at a very low level on December 4, 1961.



North Atlantic Fisheries

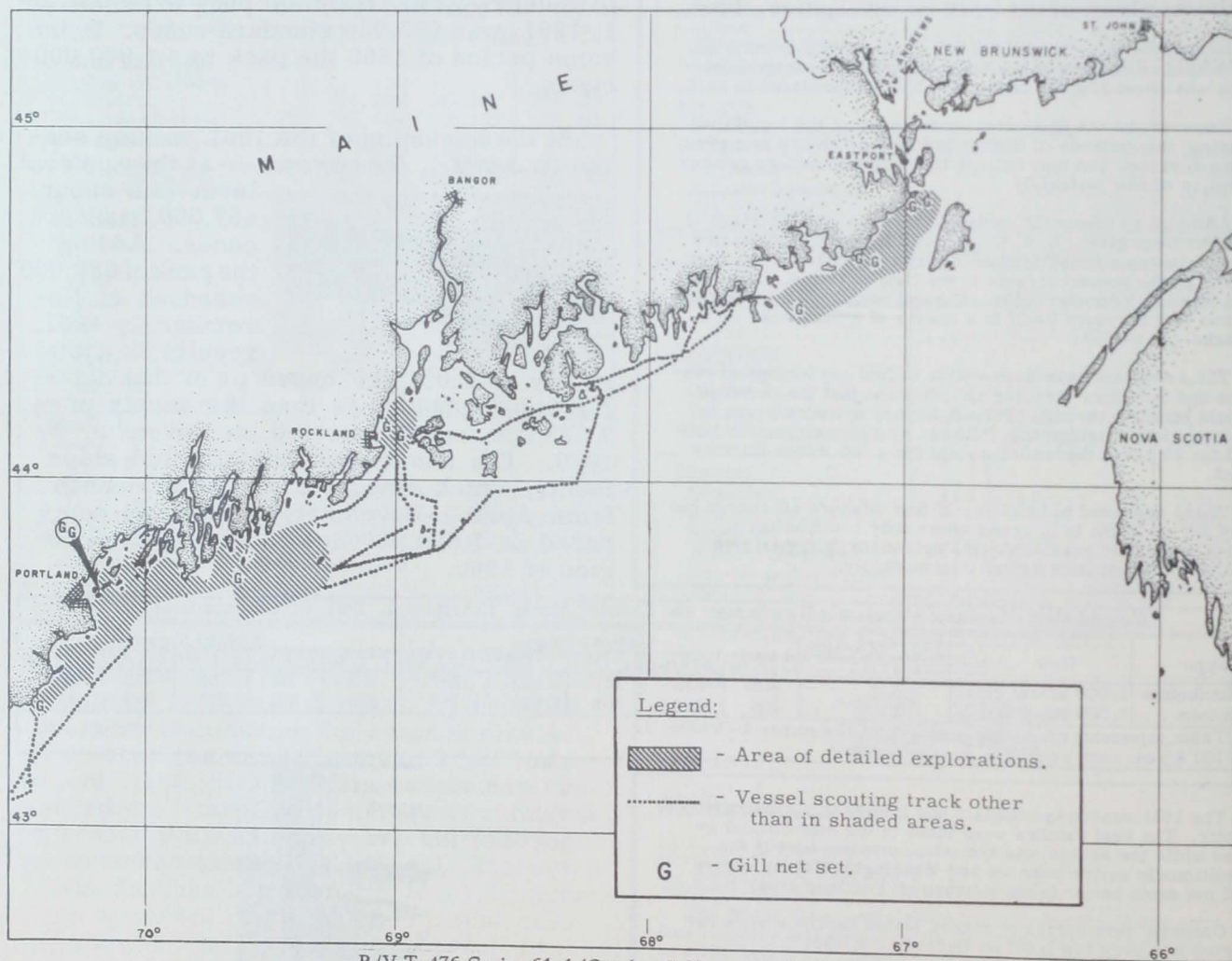
Exploration and Gear Research

COMMERCIAL CONCENTRATIONS OF HERRING SOUGHT OFF NEW ENGLAND COAST:

R/V "T-476" Cruise 61-1, October 9-November 3, 1961: A search for herring along the northern New England coast was conducted with the Bureau's exploratory fishing vessel T-476 during this cruise. The purpose of the cruise was to scout for commercially-usable concentrations of sardines and to report the size and location of any such concentrations found to the sardine industry. The area of explorations extended from Cape Ann, Mass., to Canada. Coastal waters were searched by echo-sounder, by visual watch for surface indications, and by setting gill nets.

Herring were located in several areas. One school was sounded in Grand Manan Channel off Cutler Harbor. However, the fish were in water too deep for conventional fishing methods. Daytime sampling (with vertical gill nets) were unproductive due to the clearness of the water. Subsequent efforts to locate this school of herring at night were unsuccessful. A blind night set (with no fish traces showing on the sounding machine) was made in the area using surface gill nets. Only a few sardines (approximately 6 inches average length) were taken in the set. (It was later learned that this school had been watched for some time by commercial fishermen but had never moved into waters that would permit their being caught.)

Promising evidence of fish were found in the Pleasant Bay area near Ladle Ledge,



R/V T-476 Cruise 61-1 (October 9-November 3, 1961).

Norton Island, and Flint Island. The fish, as interpreted from tracings on the echosounder, seemed to be in small groups of from 12 to 20 feet in diameter with 200-700 feet between concentrations. Similar, but not as extensive, fish tracings were encountered near Petit Manan Island and the western side of Schoodic Island. This information was relayed to commercial fishermen in the area for possible use should the fish school up.

Scattered midwater fish tracings were found in the vicinity of Isle Au Haut and Martinicus Rock. The depth of water was about 55 fathoms; the traces were generally 4 to 14 fathoms below the surface.

Other findings of interest included persistent traces of individual fish or small groups of fish that were found in the vicinity of the eastern end of West Cod Ledge, between Bantam Rock and Damariscove Island whistle buoy, and near Mt. Desert Rock whenever those areas were inspected.

Eleven gill-net sets were made during the cruise. Of that number, 6 sets were made with a vertical-type gill net (set from the surface to 10 fathoms deep) and 5 sets with conventional-type gill nets. Of the conventional gill-net sets, 4 were surface sets and 1 was a bottom set. Species taken included: herring (*Clupea harengus*); bluebacks (*Alosa aestivalis*); whiting (*Merluccius bilinearis*); hake (*Urophycis chuss*); and dogfish (*Squalus acanthias*).



North Atlantic Fisheries Investigations

SEA SCALLOP SPAWNING CHECKED OFF MASSACHUSETTS:

M/V "Charlotte" Cruise 2: In order to check spawning of sea scallops 2 to 5 miles offshore northwest of Sandwich, Mass., the vessel Charlotte, chartered by the U. S. Bureau of Commercial Fisheries, operated in that area on November 14, 1961. A total of six 20-minute tows were made and 250 scallops were measured, sexed and observed for condition of gonads; assorted fish and invertebrates were brought back to the Laboratory.

Two percent of the scallops were unspawned, 18 percent had started, and 80

percent were spent. Water temperature isothermal, about 50.8° F. at 68 feet.

* * * * *

NORTH ATLANTIC GROUND FISH SURVEY COMPLETED:

After completing the second part of an extensive groundfish survey which included sampling the fish populations in the southern New England area, as far south as Hudson Canyon, on Georges Bank and the Great South Channel, the fisheries research vessel M/V Delaware returned to Gloucester, Mass., on November 20, 1961.

The vessel departed from Woods Hole, Mass., on November 8 and fished at selected stations throughout the area. Biological data collected included blood samples from scup, red hake and white hake; age and growth material from haddock, cod, fluke, yellowtail, and whiting; and whiting stomachs. Special collections of young haddock and longfin hake were made for further study in the laboratory. Invertebrates (such as shrimp, starfish, and others) caught at each station were preserved and returned to the laboratory. Hydrographic observations were made throughout the cruise and bottom drift parasols were released at each station.

Note: Also see Commercial Fisheries Review, Dec. 1962 p. 41.



Nutrition

CARDIOLOGIST RECOMMENDS CHANGE IN ARMY DIET:

"Atherosclerosis in the Armed Forces: Should the Military Diet be Altered?" was the subject of a presentation at the annual meeting of the Association of Military Surgeons of the United States on November 8, 1961, by two top medical officers of the U.S. Army.

Col. Weldon J. Walker, Chief, Cardiology Service, Department of Medicine, Walter Reed General Hospital and Consultant in Cardiology to the Surgeon General of the Department of the Army, and Lt. Col. Jacques L. Sherman, Jr., Chief, Medical Research Branch, U. S. Army Medical Research and Development Command, made the presentation which was concluded with the following "Summary and Recommendation":

"Atherosclerosis is a major cause of death and disability among military personnel. The results of population studies show that the standard Army diet is of the type that has been associated with an increased incidence of hypercholesterolemia and atherosclerosis. It is therefore recommended that consideration be given to the feasibility of altering the military diet so that dietary fat does not exceed 35 percent of the total caloric intake, and that a greater proportion of this fat should consist of polyunsaturated fatty acids. Such a change is feasible without impairing the palatability of the diet, and there is no evidence that it would be harmful to anyone. The desirability of the recommended change is supported by the best scientific information available at the present time."

The portion of the paper of most interest to the fishery and allied industries follows:

"...Because of the conflicting data and numerous gaps in our knowledge concerning the relationship of cholesterol and other lipids to atherosclerosis, many have felt that the clinician should avoid attempts to draw prophylactic and therapeutic implications at the present state of our knowledge. However, if we demanded complete knowledge of a disease entity before treating a patient for the disease or attempting to prevent it, most of us would never have practiced medicine. In view of the magnitude of the problem, it would seem imperative to ask if we are not justified in drawing a few tentative conclusions from the data available, so long as these views and conclusions are not potentially harmful to the individual and remain flexible enough to be modified as additional facts become available.

"The Surgeon General in AR-40-564, 9 February 1956, prescribed the basic standards of diet in terms of nutrients for the military ration. In this regulation minimum levels for the physically active soldiers are established for calories, protein, calcium, riboflavin, niacin, vitamin A, and vitamin C. A minimum of 3,600 calories and 100 grams of protein are prescribed for the physically active soldier. No recognition is made of either fat or carbohydrate. Currently the "Joint Army/Air Force Master Menu" is calculated to provide from 4,100 to 4,400 edible calories with the expectation that there will be a kitchen and plate waste of 500 to 800 calories. In addition, Public Law

690 was enacted by the 83rd Congress to provide an increased allowance of dairy products for the Armed Forces diets. In compliance with this law, it has been the policy of the Quartermaster General to allow up to 22 ounces of milk per ration in addition to the milk included in the Master Menu.

"With the above food allowances in effect, it is of interest to know what the soldier actually eats. Recent nutritional surveys accomplished at four Army training camps show that actual total intake is well above the minimum daily recommended allowance. The average total food intake was 4,265 calories with 42.4 percent of the calories being supplied by fat, 45.4 percent by carbohydrates, and 12.2 percent by protein.

"Evaluation of the actual foods consumed showed that of the 210 grams of fat, 41 to 46 percent is saturated, 35 to 40 percent is monounsaturated (mostly as oleic acid), and 15 to 20 percent is made up of polyunsaturated fatty acids. Previously cited population studies have indicated that such diets are associated with a high incidence of atherosclerosis.

"In January, 1961, the Central Committee for Medical and Community Program of the American Heart Association published a report on dietary fat and its relation to heart attacks and strokes. The conclusion of this report states, 'The reduction or control of fat consumption under medical supervision, with reasonable substitution of polyunsaturated for saturated fats, is recommended as a possible means of preventing atherosclerosis and decreasing the risk of heart attacks and strokes. This recommendation is based upon the best scientific information available at the present time.'

"No precise figures exist for the total percentage of calories which should be provided by fat, nor is there established an exact proportion of saturated to unsaturated fat for an ideal diet. There is, however, general agreement among nutritionists who have studied the problem that a diet providing from 25 to 35 percent of total calories from fat is reasonable. It is also generally agreed that substitution of polyunsaturated fat for a substantial part of the saturated fat in the diet is desirable. Total caloric intake should, of course, be adjusted to maintain ideal weight.

"Diets based upon these principles have been used in several metabolic studies which show clearly that abnormal serum lipid levels can be reduced toward normal. More important, such a diet is being used in a study conducted by the New York City Department of Health. The 'Prudent Diet' used in this study restricts the dietary fat intake to 30 percent of total calories with polyunsaturated fatty acids predominating over the saturated fats. There is a reduction in foods such as whole milk, cream, butter, hard cheeses, beef, pork, solid shortening, and chocolate, which are high in saturated fats. In contrast, chicken, turkey and other fowl, fish and shellfish, cottage cheese, cereals, fruits, nuts, and natural vegetable oils are all relatively high in polyunsaturated fatty acids and are therefore recommended.

"This diet has proven to be palatable, inexpensive, and effective in reducing serum cholesterol and beta-lipoprotein levels in persons on normal activities who eat at home under their own supervision. This does not represent a radical change in the American diet. Many of the changes are substitutions: certain margins for butter, skim milk for whole milk, vegetable oils for solid shortenings, sponge and angelfood cake for richer pastries, more fish and fowl, and less beef and pork. Controlled, long-range dietary studies to assess the influence of such dietary changes on longevity is an obvious field for meaningful clinical research."



Salmon

OUTLOOK FOR BRISTOL BAY RED SALMON RUN IN 1962 IS POOR:

The 1962 Bristol Bay, Alaska, red salmon run is expected to drop off from the runs of the past two years, the Alaska Commissioner of Fish and Game announced late in November 1961. The prediction was based on studies by the Alaska Department of Fish and Game, the U. S. Bureau of Commercial Fisheries, and the University of Washington Fisheries Research Institute. All three agencies are participating in coordinated salmon research in the Northwest.

The total Bristol Bay red salmon run (including any Japanese catch made on the high seas) is expected to be between 6 million and 12 million fish, with about 9 million fish con-

sidered a probable total. In 1960 the Bristol Bay red salmon run was 37 million fish and the 1961 run was 18 million fish--the Japanese catch is not included in the totals for both those years.

The Alaska Commissioner stated that in 1962 the expected runs of red salmon to the several Bristol Bay districts (without making allowances for fish the Japanese may catch) are estimated at: Naknek-Kvichak, 6.3 million fish; Nushagak, 900,000 fish; Egegik, 400,000 fish; and Ugashik, 1.7 million fish.

The low predictions are based on several factors, including low escapements in 1957 and 1958 and low out-migrations of young salmon from those escapements. There also appeared to be an unusually high mortality of young salmon which entered the sea in 1959.

The outstanding feature of the 1962 run is the likelihood that the important Nushagak and Egegik district runs will be so poor that there is serious question whether Alaska will feel it advisable to permit the usual type of operation in those fisheries.

It was pointed out that several types of information were used in arriving at the estimates and that variation from the above figures for individual districts can be expected.

The Alaska Commissioner stated that: "Barring any impact whatsoever of the high-seas fishery, the size of the catch in the various districts of Bristol Bay can be expected to range from 'only fair' to 'nothing at all.'"

* * * * *

NEW METHOD OF MARKING FINGERLINGS:

A new method of marking fingerling salmon has been developed by the Seattle Biological Laboratory of the U. S. Bureau of Commercial Fisheries. At the Leavenworth Hatchery food was withheld from approximately 50,000 fingerling sockeye salmon for a period of two weeks. This brief period of starvation resulted in no greater mortality and only 2 percent less growth than in a control group of fish which were fed in the normal way. A distinctive annular ring appeared on scales of 84 percent of the starved fish. Ultimate development of this

new technique, if successful in all its aspects, will permit marking of almost the entire production of a hatchery at very little cost.

* * * * *

RETURNS HIGH AT OREGON STATE HATCHERIES IN FALL OF 1961:

A large number of silver salmon returned to Oregon Fish Commission salmon hatcheries as of November 1961, according to a statement by the Director of Fish Culture.

"We now have on hand enough silver salmon eggs and ripening adults to operate this year's silver-rearing program even if we did not take another fish this season," the Director reported. "Normally November and December are the big months for silver salmon spawning runs." The heavy return of fish to hatchery streams as early as November augurs an exceptionally large run of fish or an unusually early one, he further stated.

At Fall Creek, site of the Fish Commission's Alsea Salmon Hatchery, for example, 1.6 million eggs were reported on hand as of November 3, with another 500,000 expected to be taken from ripening adults in the hatchery's holding pond. This was the largest egg take at the Alsea Hatchery since it began operations in 1952. To that date, 1,200 adult females and 1,100 adult males had been taken at the Fall Creek installation in addition to 3,000 silver jacks. Returns at other stations handling silver salmon were comparable.

The 1958 brood, represented in the current hatchery returns of adult silvers from the ocean, was the first reared under the new feeding program initiated at Fish Commission hatcheries three years ago. Young salmon are started on a "wet" diet composed essentially of finely ground meat and fish products. Research has shown that raw salmon viscera, one of the components of the wet diet, is responsible for transmission of various diseases to the young fish. Under the new program this portion of the diet is now pasteurized, thus eliminating one of the primary causes of hatchery fish mortality. The development of the nutritionally-complete Oregon moist pellet, through the cooperative efforts of the Fish Commission and Oregon State University specialists, has also made a major contribution to the success of the hatchery production program. Silver salmon are fed these pellets from the time they reach $2\frac{1}{2}$ to 3 inches in length until they are

ready for release as yearlings, at which time they usually average from 6 to 7 inches in length.

The superintendent of the Alsea Salmon Hatchery estimated that sportsmen took over 1,000 salmon from the stream below the hatchery prior to its closure on November 1 under provisions of the winter sport fishing regulations. "This is a new sport fishery," he reported. "Prior to this year the silver run was not sufficiently large to attract any appreciable number of anglers."

In a spot check of sport fishermen angling downstream from the Commission's rack on the East Fork of the Millicoma River in Coos County, 24 out of 25 silver salmon examined in a creel check were marked fish reared and released from the Commission's Millicoma salmon-rearing pond.



Shellfish

TWO SANITATION CENTERS TO BE BUILT:

The Secretary of Health, Education and Welfare, announced early in November 1961 that the U. S. Public Health Service will build a shellfish sanitation research center about 30 miles south of Mobile, Ala. This is one of two such installations authorized by Congress in the last session. The site of the other laboratory has been selected adjacent to the Rhode Island University Marine Laboratory. A third laboratory is already in operation on the Pacific Coast at Purdy, Wash.

The Gulf Coast laboratory will be located on the west side of Mobile Bay on Dauphin Island at Indian Mound Park. The Dauphin Island property was presented recently to the Alabama Department of Conservation for use as a public park and as a site for a seafood research facility. The Seafood Division of the Alabama Department of Conservation plans to construct a research building on an adjacent site.

About 25 persons will be employed at the Alabama installation. The new center will be devoted to research and technical assistance in shellfish sanitation, and will be a part of the Federal Government's expanding activities in the field of oceanographic research.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS AS OF DECEMBER 1, 1961:

Item and Period	1961	1960	1959	1958	1957
..... (1,000 Lbs., Heads-Off)					
Total landings, S. Atl. & Gulf States:					
December	1/	7,097	8,716	8,099	6,718
November	9,100	14,454	12,412	12,416	9,302
October	12,479	21,690	19,602	16,461	14,256
January-November ..	83,300	133,938	121,943	108,453	109,520
January-December ..	1/	141,035	130,659	116,552	116,238
Quantity used for canning, Gulf States 2/:					
December	1/	977	1,278	1,943	882
November	1,600	1,614	2,312	3,424	953
October	2,135	2,567	2,531	3,489	1,616
January-November ..	14,178	27,617	23,401	24,461	17,504
January-December ..	1/	28,594	24,679	26,404	18,386
Frozen inventory (as of end of each month) --					
raw headless only 3/:					
December	1/	40,913	37,886	32,844	21,719
November	1/	37,264	37,334	30,211	22,326
October	17,811	31,209	33,057	24,620	20,362
September	13,361	24,492	26,119	18,079	16,896
January-December monthly avg.	1/	25,954	27,297	18,008	13,627
Imports 4/:					
December	1/	12,411	10,611	10,447	6,865
November	1/	13,516	10,269	10,617	6,789
October	1/	14,211	15,340	11,463	9,237
September	8,629	8,190	7,541	7,620	7,471
January-September ..	79,175	73,280	70,335	52,866	46,786
January-December ..	1/	113,418	106,555	85,394	69,676

1/Not available.
 2/Pounds on headless shrimp determined by multiplying the number of standard cases by 33.
 3/Shrimp products other than raw headless not included.
 4/Includes fresh, frozen, canned, dried, and other shrimp products as reported by U. S. Bureau of Customs.
 Note: Data for 1961 preliminary. November 1961 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

CENTRAL ALASKA CATCHES OUTSTANDING:

A total of over 3.2 million pounds of shrimp was caught by two shrimp trawlers, operating off Kodiak Island in 1961 (to October 28), according to records of the Alaska Department of Fish and Game. The average catch per trip for one vessel was 75,265 pounds for 23 trips, and the other vessel averaged 68,654 pounds per trip for 22 trips. One trip of 7 days yielded 102,997 pounds, or nearly 8 tons per drag.

Operating out of Seward, Alaska, the two trawlers fished entirely in the Sitkalidka Straits, southeast of Kodiak Island, in 60 to 65 fathoms of water. The average drag was 30 minutes to one hour and each trip was about 1 1/2 days.

The two trawlers are in the 75- to 80-foot class and all trawling was done with 57-foot Gulf of Mexico-type shrimp trawls.

Due to the very small size of the shrimp, expanded production will depend on the solution of processing and marketing problems.



South Atlantic Exploratory Fishery Program

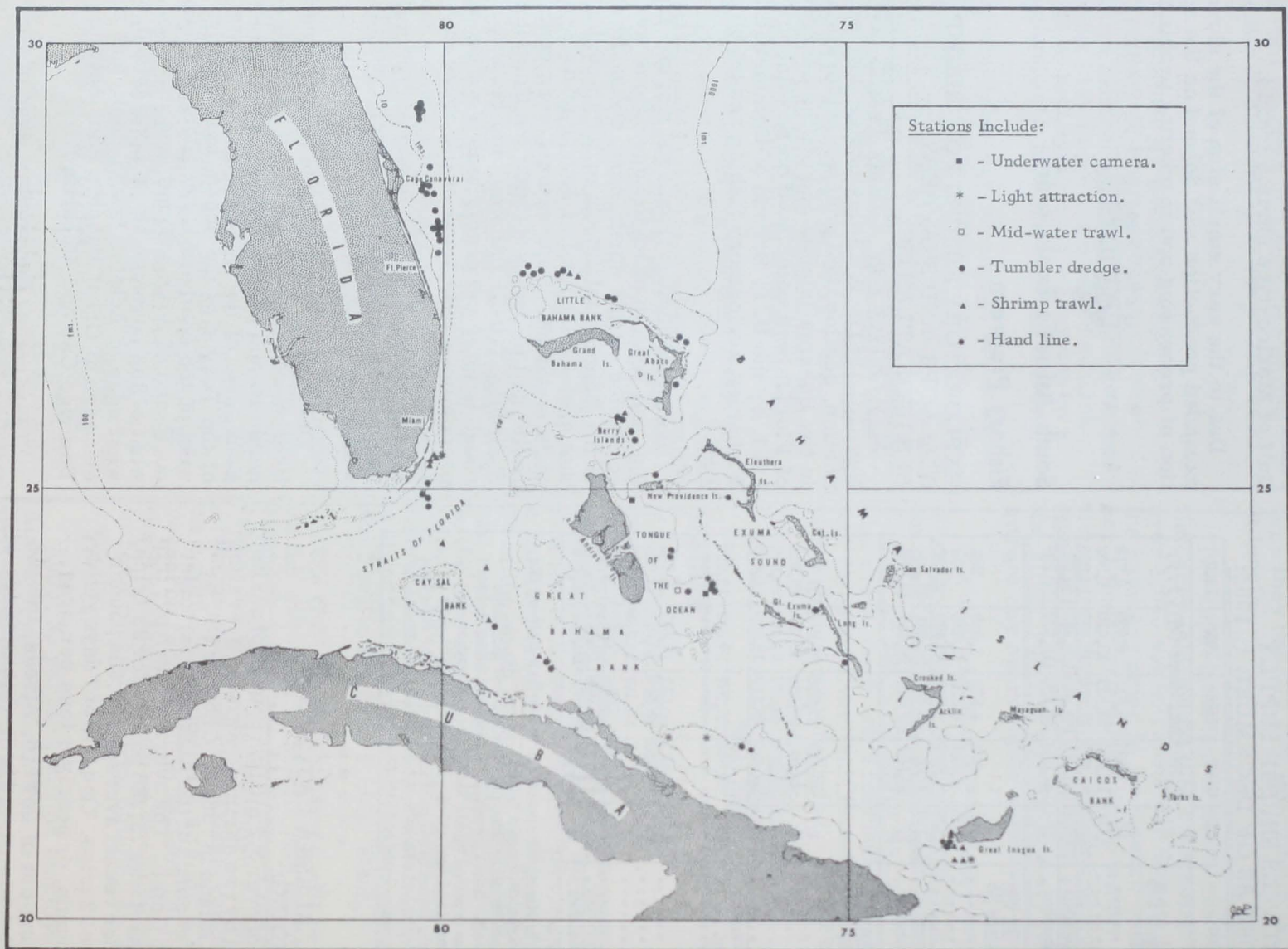
EXPLORATORY FISHING FOR SHRIMP, SCALLOPS, AND SNAPPERS IN SOUTH ATLANTIC:

M/V "Silver Bay" Cruise 34 (Oct. 21 - Nov. 13, 1961): A 22-day cruise devoted to shrimp, scallop, and snapper explorations in the Bahama Islands and off the east coast of Florida was completed on November 13, 1961, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

Bottom sounding transects, shrimp trawling, and scallop dredging operations were conducted off the north, east, and south edges of the Bahama Islands in order to evaluate that area as a potential source of deep-water shrimp stocks. Explorations were generally restricted to depths outside the Continental Shelf edge (10-35 fathoms) and revealed that rough bottom and precipitous slope conditions predominate over most of the areas surveyed. Bottom trawling and dredging was extremely limited by the topography and only negligible amounts of small noncommercial species of shrimp were encountered.

Difficult and untrawlable bottom conditions were encountered in the following areas: northern and eastern edge of Little Bahama Bank, east of the Berry Islands, eastern edge of the Tongue of the ocean, eastern edge and west of the southern tip of Eleuthera Island, south end of Exuma Sound, eastern edge and west of the southern tip of Long Island, southwest edge of Acklins Island Bank, and southern edge of Great Bahama Bank between Santo Domingo Cay and Mucaras Reef.

Trawling off the western edge of Great Bahama Bank in the Santaren Channel in depths from 200 to 470 fathoms produced catches of Penaeopsis megalops and Cari-



M/V Silver Bay Cruise 34 (Oct. 23, 1961 to Nov. 13, 1961).

dean shrimp. Catches ranged only up to eight pounds. One royal red shrimp (*Hy-menopenaeus robustus*) was taken in 315 fathoms off the northeast edge of Cay Sal Bank. Catches of up to 34 each 31-35 count (heads-off) pink shrimp (*Penaeus duorarum*) were made in 30-60 fathoms off Carysfort Reef, Florida.

A limited number of snapper hand-line stations in depths ranging from 7 to 30 fathoms resulted in uniformly negative results.

Three and a half hours of trolling in the Old Bahama Channel near Guinchos Cay resulted in the capture of about 245 pounds of fish comprised of the following species: great barracuda (*Sphyraena barracuda*) 27 fish; dolphin (*Coryphaena hippurus*) 4 fish; rainbow runner (*Elagatis bipinnulatis*) 2 fish; little tuna (*Euthynnus alletteratus*) 1 fish; and cero (*Scomberomorus regalis*) 1 fish.

Twenty-four dredging stations were occupied on the Cape Canaveral calico scallop bed to provide samples and specimens for Bureau technologists and biologists.



Tuna

UNITED STATES AND TERRITORIES CANNED PACK AT RECORD HIGH:

As of November 18 for the United States west coast, and as of October 31 for Hawaii, American Samoa, and Puerto Rico, the 1961 tuna pack for those areas totaled 13.1 million standard cases--an increase of 800,000 cases or 7 percent as compared with the previous record pack in 1960 for the same period. The pack in the areas mentioned represented over 95 percent of the total pack in the United States and possessions.

While the 1961 California tuna pack through November 18 of 9.6 million cases was slightly ahead of the 1960 pack for the same period, most of the increase was in the pack of tuna in the Islands.

If for the balance of 1961 the rate of tuna packing kept pace with that during the latter part of 1960, the 1961 pack was expected to approximate a record total of 16 million cases.

YELLOWFIN LANDINGS FROM EASTERN PACIFIC:

Yellowfin tuna landings in the United States and Latin American countries in 1961 (through November 15) from the Eastern Pacific totaled a record 104,000 tons as compared with 95,700 tons during the comparable period of 1960, a gain of 9,100 tons or 10 percent.

The 1961 yellowfin landings to date approximate the former record total landings for all of 1960.

NEW CANNERY AT CAMBRIDGE, MD.:

Construction of a modern tuna cannery is now under way at Cambridge, Md., in a large warehouse purchased from a frozen foods corporation. The tuna cannery, a subsidiary of a large West Coast tuna canning firm, is scheduled to be in operation by April 1962.

Japanese-caught Atlantic tuna will be the principal source of raw fish for the cannery. Frozen tuna will be transshipped directly to Cambridge in refrigerated vessels with a carrying capacity of 600 tons.

A large cold-storage plant, included with the cannery purchase, has a capacity for over 5,000 tons of frozen tuna. The firm expects to can about 6,000 tons of raw tuna during the first year of operation. Canning equipment includes 3 high-speed half-pound lines with the latest automatic filling and closing machines.

About 150 local people will be employed in the cannery at the start of the canning operations.

The canned product will carry the same brand name as marketed by the parent company on the West Coast. The Maryland plant's canned tuna pack will be marketed on the Atlantic seaboard which should result in a saving in transportation costs to the consuming areas as compared with shipments from the West Coast.



United States Commercial Fishery Landings, January-September 1961

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1961 and 1960				
Species	Period	1961 ^{1/}	1960	Total 1960
. (1,000 lbs.)				
Anchovies, Calif. 2/	9 mos.	5,100	2,692	3,304
Cod:				
Maine	8 mos.	1,900	2,437	2,897
Boston 3/	9 "	15,900	12,052	15,548
Gloucester 3/	9 "	2,100	2,392	3,199
Total cod		19,900	16,881	21,644
Crab, king, Alaska	8 mos.	32,000	20,400	28,570
Haddock:				
Maine	8 mos.	1,900	2,479	3,894
Boston 3/	9 "	65,200	62,122	76,695
Gloucester	9 "	10,900	9,973	12,107
Total haddock		78,000	74,574	92,636
Halibut 4/:				
Alaska	9 mos.	24,500	20,760	21,351
Wash. & Oreg.	9 "	14,100	16,174	16,802
Total halibut		38,600	36,934	38,153
Herring:				
Maine	8 mos.	26,600	105,783	152,327
Alaska	Year	50,000	77,913	77,913
Industrial Fish, Me., & Mass. 5/	9 mos.	37,400	39,565	43,733
Mackerel:				
Jack	9 mos.	43,500	50,156	74,945
Pacific	9 "	25,200	19,496	36,808
Menhaden	10 mos.	2,130,100	1,861,186	1,999,000
Ocean Perch:				
Maine	8 "	55,600	54,773	78,258
Boston	9 "	4,900	939	1,481
Gloucester	9 "	46,600	53,550	61,673
Total ocean perch		107,100	109,262	141,412
Salmon, Alaska	Year	262,500	207,101	207,101
Sardines, Calif.	to Nov. 11	29,500	47,633	57,513
Scallops, sea, New Bedford (meats)	9 mos.	16,000	14,658	19,353
Shrimp (heads-on), South Atlantic & Gulf States	10 mos.	125,600	200,733	236,938
Squid, Calif. 2/	9 mos.	1,400	646	646
Tuna, Calif.	to Nov. 4	280,900	250,410	283,060
Whiting:				
Maine	8 mos.	13,800	10,723	11,123
Boston	9 "	73	397	754
Gloucester	9 "	43,600	51,617	63,112
Total whiting		57,473	62,737	74,989
Total all above items		3,366,873	3,198,760	3,590,045
Others not listed		555,127	514,282	1,366,755
Grand Total		3,922,000	3,713,042	4,956,800

Total Landings: Landings of fish and shellfish in the United States during the first 9 months of 1961 were up 209 million pounds, or 6 percent more than during the comparable period of 1960.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch for the year totaled about 262 million pounds--a gain of 55 million pounds over a year ago.

Shrimp: The South Atlantic and Gulf States landings (126 million pounds) were down 75 million pounds--a drop of 37 percent as compared with the same period in 1960.

Menhaden: Landings during the first 10 months of 1961 amounted to 2,130 million pounds--an increase of 269 million pounds over the previous year. It appears that the 1961 catch will exceed the record 1959 landings of 2,203 million pounds.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) totaled about 281 million pounds to November 4, 1961--up 30 million pounds from the same period in 1960.

Haddock: The 9-months 1961 landings of 78 million pounds were 3.4 million pounds greater than during the same period in 1960.

Halibut: The Alaska, Washington, and Oregon catch through September of 38.6 million pounds was 1.7 million pounds more than in the same period in 1960.

Scallops: New Bedford landings of meats during the first 9 months of 1961 of 16 million pounds exceeded 1960 for the same period by 1.3 million pounds.

Mackerel: Landings of Pacific mackerel (25 million pounds) through September 1961 were 6 million pounds more than those in the previous year, while jack mackerel landings (43.5 million pounds) declined 5.7 million pounds.

Whiting: During the first 9 months of 1961, landings at Gloucester (54 million pounds) were down 8 million pounds as compared with the previous year.



U. S. Fishery Landings

NEAR RECORD COMMERCIAL CATCH IS INDICATED FOR 1961:

A near-record United States commercial fisheries catch in 1961 is indicated by data available in November 1961. Preliminary data point toward a total United States catch of over 5 billion pounds of fish and shellfish for the year. The 1960 catch was estimated at 4.9 billion pounds.

The 1961 catch although larger than in 1960, will be less than the record 5.3 billion pounds taken in 1956, but may equal or exceed the second highest catch of 5.1 billion pounds taken in 1959.

Data for the first 9 months in 1961 show an increase of 209 million pounds (about 6 percent) over the same period of last year. Record catches of menhaden, king crabs and possibly sea scallops, are expected. However, landings of herring, sardines, and shrimp will be far below normal. Menhaden landings of 2,130 million pounds in 1961 show an increase of 269 million pounds over the

1960 catch for the same period. One reason for this increase is a stepped-up fishing effort due to the improved market for fish meal, a menhaden product.



Crab fishing vessels docked at Fishermen's Wharf.

The Alaskan catch of salmon for 1961 totaled about 262 million pounds, a gain of 55 million pounds over 1960. Landings of tuna in California, including shipments of fish caught by United States fishing boats operating off South America, totaled about 281 million pounds from January 1 to November 4. This is up over 30 million pounds from 1960.

Shrimp landings in the South Atlantic and Gulf States in 1961 were down 37 percent. Shrimp fishermen in those States had caught 126 million pounds by the end of October, a drop of 75 million pounds. During the first nine months of 1961, landings of whiting at Gloucester Mass., totaled 44 million pounds, down 8 million pounds when compared with the same period for 1960.

Jack mackerel landings also were lower, but Pacific mackerel, halibut, haddock, and scallops were considerably higher than the 1960 catch over the same period.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, SEPTEMBER 1961:

During September 1961, 22 vessels of 5 net tons and over were issued first docu-

ments as fishing craft as compared with 23 in September 1960. The number issued first documents in the first 9 months in 1961 was 6 more than in the same period in 1960.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, September 1961 With Comparisons

Area (Home Port)	Sept.		Jan.-Sept.		Total
	1961	1960	1961	1960	
..... (Number)					
<u>Issued first documents</u> 2/:					
New England	1	1	27	27	35
Middle Atlantic	2	-	11	15	18
Chesapeake	5	8	47	58	78
South Atlantic	6	1	37	43	47
Gulf	4	7	87	71	90
Pacific	4	6	140	129	146
Great Lakes	-	-	11	13	18
Puerto Rico	-	-	2	-	-
Total	22	23	362	356	432
<u>Removed from documentation</u> 3/:					
New England	2	2	15	19	22
Middle Atlantic	4	1	21	7	18
Chesapeake	1	2	26	15	21
South Atlantic	2	4	20	26	38
Gulf	7	4	77	72	90
Pacific	8	7	70	58	87
Great Lakes	1	1	16	8	13
Puerto Rico	-	-	-	1	1
Total	25	21	245	206	290

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, September 1961

Gross Tonnage	Issued 2/	Cancelled 3/
..... (Number)		
5-9	10	6
10-19	2	9
20-29	5	2
30-39	1	2
40-49	1	-
60-69	1	2
70-79	1	2
150-159	-	1
250-259	1	-
320-329	-	1
Total	22	25

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 16 in 1961, 1 in 1959, 1 in 1953, 3 prior to 1951, and 1 unknown. Assigned to areas on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

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

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, SEPTEMBER 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during September 1961 declined 5.9 percent in quantity and 8.7 percent in value as compared with August 1961. The drop was due primarily to smaller imports of all types of frozen fillets, canned tuna and bonito, fresh and frozen salmon, canned sardines not in oil, fresh swordfish from Canada, frozen spiny lobster tails, and sea scallops. Imports were up for frozen tuna, tuna loins and discs, canned salmon, canned sardines in oil, and frozen shrimp.

Compared with September 1960, the imports in September 1961 were down 6.4 percent in quantity but up 1.5 percent in value. The increase in value was due to the higher prices in 1961 for nearly all imported fishery products. The drop in quantity came about because of smaller imports of frozen fillets other than groundfish, frozen tuna other than albacore, canned light meat tuna, fresh and frozen salmon, fresh swordfish from Canada, canned crab meat, frozen and canned lobster and spiny lobster, shrimp, and sea scallops. These declines were not offset by increases in the imports of frozen groundfish fillets, frozen albacore tuna, frozen tuna loins and discs, canned white meat tuna, canned salmon from Japan, canned sardines in oil and not in oil, and sea scallops from Canada.

Item	QUANTITY			VALUE		
	Sept. 1961	Year 1960	Year 1960	Sept. 1961	Year 1960	Year 1960
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed 1/	83.0	88.9	1,011.6	26.3	25.9	304.8
Exports:						
Fish & shellfish:						
Processed only 1/ (excluding fresh & frozen)	1.3	6.3	48.7	0.7	3.4	19.2

United States exports of processed fish and shellfish in September 1961 were down 23.5 percent in quantity and 22.2 percent in value as compared with August 1961. Compared with the same month in 1960, the exports in September 1961 were down 79.4 percent in both quantity and value. The lower

exports in September 1961 as compared with the same month in 1960 were due to a drop in the exports of canned shrimp, salmon, and California sardines.

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-SEPTEMBER 1961:

Imports: The imports of groundfish and ocean perch fillets and blocks during January-September 1961 continued to increase, reaching a new high. The largest single category, blocks and slabs, was up 43 percent as compared to the same period in 1960. Canada, Iceland, Norway, and Denmark, the principal suppliers of blocks and slabs, all showed substantial increases. Fillet imports were up 13 percent in the same period.

Fresh and frozen tuna imports dropped 15 percent; although there was a decline in imports from Japan, Trinidad and West Africa shipments were up. Canned tuna in brine imports increased slightly. A large increase in imports of canned albacore or white meat tuna from Japan was counterbalanced by a decline in canned or light meat tuna.

Commodity	Jan.-Sept.	
	1961	1960
 (1,000 Lbs.)	
<u>Groundfish and ocean perch:</u>		
Fillets	58,246	51,592
Blocks and slabs	94,126	65,807
Total	152,472	117,399
Flounder fillets	12,830	13,683
Swordfish	14,067	12,496
<u>Tuna, fresh or frozen:</u>		
Albacore	48,909	48,708
Other than albacore	103,243	129,394
Total	152,152	178,102
Tuna loins and discs	5,785	5,893
<u>Tuna, canned in brine:</u>		
Albacore	22,265	11,847
Other than albacore	19,269	26,288
Total	41,534	38,135
Tuna, canned in oil	344	532
Bonito and yellowtail, canned	8,004	8,205
Crab meat, canned	2,529	3,129
Shrimp (mostly frozen; some canned or dried)	79,175	73,280
Sea scallops, fresh or frozen	6,858	5,549
<u>Lobster, fresh or frozen:</u>		
Northern	17,812	18,463
Spiny	15,362	24,523
Oysters, canned	5,163	4,446
<u>Salmon:</u>		
Fresh or frozen	7,128	7,936
Canned	5,206	13,519
<u>Sardines:</u>		
Canned in oil	17,960	15,373
Canned not in oil	9,355	5,551
Frog legs	1,459	1,965
Fish meal	159,140 (tons)	97,333 (tons)
Fish solubles	2,508 "	2,832 "

Fresh or frozen shrimp imports were up from all major supplying countries; Mexico supplied well over half of total imports. Fresh or frozen lobster or spiny lobster imports were about the same; but increased shipments came from the South Africa Republic, Brazil, Mexico, and the Bahamas while shipments from Canada (northern lobster), New Zealand, Cuba, and Australia declined.

Canned salmon imports from Japan were down 66 percent, resulting in a sharp drop in total canned salmon imports. Fresh and frozen salmon imports declined about 10 percent owing to reduced shipments from Canada.

Norway and Portugal supplied most of the increase in the imports of canned sardines in oil. Imports of canned sardines not in oil from South Africa were up 69 percent. Imports of canned crab meat (mainly from Japan) decreased about 18 percent; canned oysters increased by about the same percentage. Fresh or frozen scallops, imported principally from Canada, were up 24 percent.

Fish meal imports were up 63 percent. Peru doubled the amount it supplied, which was about twice the amount shipped from all other nations combined. Receipts from South Africa, Angola, and Canada also increased considerably while those from Chile declined. Imports of fish solubles declined by 11 percent. Imports of frog legs showed a 26-percent drop, owing mainly to a reduction in receipts from Cuba.

Exports: Exports of canned sardines during the first 9 months of 1961 were about one-third of the amount for the same period in 1960, due primarily to the sharp decline in sales to the Philippines. However, the Philippines and Ecuador continued to be the two leading foreign markets for canned sardines not in oil, taking over one-fourth of the total quantity exported. Exports of canned mackerel increased by 190 percent.

The United Kingdom took 48 percent of the total canned salmon exports, but the total amount was less than half that sold there during the same period in 1960. Other countries continued to increase their purchases of canned salmon. Exports of fresh or frozen salmon to all countries decreased.

Exports of fresh or frozen shrimp were twice those of the same period in 1960. Ex-

Table 2 - U. S. Exports of Selected Fishery Products, January-September 1960 and 1961

Commodity	Jan. -Sept.	
	1961	1960
Fish oils(1,000 Lbs.)..	
Oysters, shucked	95,375	107,778
Salmon:		
Fresh or frozen	750	1,697
Canned	4,743	6,480
Mackerel, canned	2,596	896
Sardines:		
Canned, not in oil	4,463	13,285
Canned, in oil	154	135
Shrimp:		
Frozen	3,602	1,857
Canned	2,009	2,631
Squid, canned	1,109	6,890
Misc. fish, fresh or frozen (mostly fresh-water)	2,287	3,588

ports to Japan accounted for the increase. Canada took 36 percent; Japan, 50 percent.

Exports of canned shrimp were down 24 percent, owing to smaller shipments to Canada and the United Kingdom because of a drop in the pack.

A sharp reduction in canned squid exports has resulted from an unfavorable exchange rate in the Philippines. Exports of squid to Greece also decreased markedly.

Fish oil exports were down 12 percent due to sizable reductions in shipments to Sweden, Netherlands, and West Germany. An increase was reported in shipments to Canada, Norway, and certain other countries, but not enough to overcome the large decline in exports to the principal markets of 1960. Peruvian fish oil was reported to be replacing United States oils in the major markets.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1961 at the 12½-percent rate of duty was 57,114,714 pounds (about 2,720,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

Imports from January 1-October 28, 1961, amounted to 45,545,956 pounds (about 2,168,900 std. cases), according to data compiled by the Bureau of Customs.

Imports in 1960 for the period January 1-October 29 amounted to 41,295,078 pounds (about 1,966,400 std. cases).

Note: Pounds converted to cases at 21 pounds equal 1 std. case of 48 7-oz. cans.

EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN, JANUARY-AUGUST 1961:

With the increase in the prices of frozen shrimp and the light supplies, shipments to Japan slowed up considerably in August 1961. Of the almost 7.0 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 8 months of 1961, almost 4.9 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. Most of the re-exports consisted of shrimp imported into the United States from Mexico.

Type of Product	July	August	Jan.-Aug.
	(1,000 Lbs.)		
Domestic	1,211	243	1,900
Foreign	1,137	254	2,959
Total	2,348	497	4,859

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

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of 1961 and a strong market, that country has purchased substantial quantities of shrimp from the United States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

FISHERY IMPORT TRENDS, 1960:

For the first time in 11 years, the value of annual imports of fishery products entering the United States declined. In 1960, the foreign value of imported fishery products totaled \$360,065,000, a decrease of 2 percent from the record high reached in 1959. This value was, however, 82 percent greater than the value of imports in 1950. Edible fishery products were valued at \$307,380,000 and

other fishery products at \$52,685,000. There were declines in both categories.

The United States remained the world's leading importer of fishery products. In 1960, a total of 112 countries shared in the United States market for fishery products. For countries like Japan, fishery products are an important part of their trade with the United States. Mexico earns much of its dollar exchange from its sale of shrimp. Likewise, frozen fish and shellfish in various forms provide considerable dollar exchange for Canada and Iceland.

Trends by Countries: Canada, Japan, and Mexico, the leading suppliers of fishery products to the United States (table 1), accounted for 62 percent of the value of all United States fishery imports. Canada alone provided over 28 percent. Other leading countries in the top ten during 1960 were: Peru, Norway, South Africa Republic, Australia, Iceland, Panama, and Portugal.

Country	1960	1959	1958	1957	1956
	(US\$1,000)				
Canada	102,878	101,967	107,005	97,404	95,483
Japan	85,256	96,226	84,872	77,202	70,800
Mexico	36,705	32,869	28,005	25,248	27,815
Peru	14,270	16,374	10,907	9,167	7,320
Norway	12,506	16,405	12,087	11,144	13,620
South Africa Rep.	12,030	12,090	9,332	8,554	8,039
Australia	9,839	8,180	7,665	7,766	6,609
Iceland	9,306	10,000	8,775	6,022	6,200
Panama	5,767	6,458	5,852	6,291	4,269
Portugal	5,289	5,452	5,177	5,507	4,907
Ecuador	4,467	4,159	3,510	3,075	2,308
Denmark	4,342	8,239	5,728	3,463	2,887
El Salvador	4,215	1,297	660	60	-
German Fed. Rep.	4,100	1,814	1,805	1,008	1,319
Brazil	3,916	3,002	2,359	2,337	2,976
Cuba	3,901	4,810	5,542	6,282	8,158
Chile	2,630	1,282	2,007	1,130	1,673
Netherlands	2,562	2,628	1,509	2,496	928
India	2,363	2,239	1,547	1,407	1,328
France	2,317	2,230	1,169	1,139	2,273
United Kingdom	1,759	2,388	1,787	1,540	2,033
Angola	267	3,023	2,065	1,046	742
Other	^{1/29} 380	23,368	17,806	18,155	9,510
Total	360,065	366,500	327,171	297,443	281,197

^{1/}Imports from 90 countries.
Note: Value at the foreign port of shipment.

In 1960, annual imports from a number of countries increased, including those from Mexico, Australia, Brazil, Chile, El Salvador, and West Germany. On the other hand, imports were down from Japan, Norway, Peru, Denmark, Panama, Angola, United Kingdom, and Cuba.

Table 2 - Value of U. S. Imports of Fishery Products from Canada, 1960, by Principal Products

Product	Value
	US\$1,000
Fresh or frozen:	
Lobster	14,018
Fresh-water fish	11,754
Fish blocks	11,313
Groundfish fillets	10,285
Salmon	6,325
Halibut	5,711
Flounder fillets	5,358
Fresh-water fish fillets	5,671
Other fresh or frozen	11,382
Total fresh and frozen	81,817
Canned lobster	4,382
Fish meal and scrap	3,287
Other fishery products	13,392
Total imports	102,878

Canada: During 1960, Canada was the leading supplier of fishery products to the United States market with products valued at \$102,878,000. This represented a small gain in value over 1959 but still somewhat less than the high reached in 1958. Canada supplies the United States with a wide variety of fishery products. As usual, fresh and frozen fishery products predominated.

Japan: In 1960, the value of fishery imports from Japan was \$85,256,000, about 11 percent less than the 1959 value. Declines in imports of shrimp, salmon, and crab meat contributed to the decrease. Various tuna products continued to be the major part of the trade.

Table 3 - Value of U. S. Imports of Fishery Products from Japan, 1960, by Principal Products

Product	Value
	US\$1,000
Fresh or frozen:	
Albacore tuna	9,198
Other tuna	11,289
Shrimp	1,880
Swordfish	5,282
Canned:	
Light-meat tuna in brine	10,462
White-meat tuna in brine	5,975
Salmon	7,116
Crab meat	5,461
Pearls, cultivated	13,627
Other	14,966
Total	85,256

Mexico: Mexico ranked third as a supplier of fishery products to the United States. During 1960, Mexico supplied 55 percent of the total value of fresh or frozen shrimp imported into the United States. Mexican shrimp imports were 13 percent greater in 1960 than during 1959. The value of shrimp imports was nearly 6 times that of all other fishery products received from Mexico; fresh or

frozen shrimp, \$31,285,000; other fishery products, \$5,420,000; total \$36,705,000.

Other Countries: In 1960, the principal products of other leading suppliers were:

Country	Product	Value
		US\$1,000
South Africa Republic	Frozen spiny lobster	9,767
Australia	Frozen spiny lobster	9,147
Iceland	Groundfish fillets & blocks	7,881
Panama	Shrimp, mostly frozen	5,674
Norway	Canned sardines	5,092
Peru	Fish meal	3,899
Portugal	Canned sardines	2,362
Denmark	Frozen fillets & blocks	1,538

Areas of Origin: During 1960, North American countries continued to be the principal sources of supply for fishery products imported into the United States (table 4). A total value of \$158,202,000, or 44 percent, of the total imports came from North American sources. Asia was the second leading area of supply. Other continental sources ranked as follows: Europe, South America, Africa, and Oceania.

Table 4 - Value of U. S. Imports of Fishery Products by Area of Origin, 1960

Area	Edible	Other	Total
North America	151,513	6,689	158,202
Asia	69,612	22,237	91,849
Europe	38,319	9,475	47,794
South America	19,126	12,104	31,230
Africa	15,123	1,731	16,854
Oceania	13,687	449	14,136
Total	307,380	52,685	360,065

Note: Value at the foreign port of shipment.

Trends by Commodities: For the seventh consecutive year, the value of United States imports of shrimp increased. Fresh and frozen shrimp was the leading item in the import trade (table 5). Other leading products were: fresh or frozen lobster, fresh or frozen groundfish and ocean perch fillets and blocks, frozen tuna, canned tuna, pearls, fish meal, canned sardines, and canned salmon.

Shrimp: The value of shrimp imports increased 8 percent to \$56,380,000 in 1960. This set a new record for this product. Greater shipments were received from Mexico, El Salvador, British Guiana, Colombia, Egypt, and Iran. There were declines in shipments from Japan, Panama, Ecuador, and India.

Table 5 - Value of U. S. Imports of Fishery Products, by Selected Commodities, 1956-60

Commodity	1960	1959	1958	1957	1956
(US\$1,000)					
Edible Products:					
Fresh or Frozen:					
Shrimp	56,380	52,306	43,162	35,415	32,986
Tuna	31,713	29,728	25,377	16,765	15,337
Groundfish fillets and blocks	33,265	38,759	30,431	27,417	25,987
Lobster	44,794	38,635	35,661	36,827	34,285
Other	61,845	60,940	63,243	55,575	50,663
Total fresh or frozen	227,997	220,368	197,874	171,999	159,258
Canned:					
Tuna	19,142	21,688	16,882	17,002	14,998
Salmon	7,541	11,130	11,271	9,470	11,650
Sardines	9,115	8,370	8,564	8,957	7,110
Crab meat	5,514	7,947	6,116	6,254	5,318
Lobster	5,239	6,441	3,952	5,017	5,031
Other	16,067	17,083	15,561	14,645	13,486
Total canned	62,618	72,659	62,346	61,345	57,593
Other edible products	16,765	18,006	19,992	17,612	16,315
Products other than edible:					
Fish meal	11,068	15,884	11,335	9,717	11,518
Pearls	14,563	13,678	10,944	9,989	8,651
Other	27,054	25,905	24,680	26,781	27,862
Total	52,685	55,467	46,959	46,487	48,031
Grand Total	360,065	366,500	327,171	297,443	281,197

Note: Value at the foreign port of shipment.

Lobster: Northern lobster imports, nearly all from Canada, comprised 37 percent of the total lobster imports; spiny lobster made up 63 percent. Almost half of the spiny lobsters came from South Africa Republic, Cuba, and Australia. In 1960, fresh and frozen lobster imports were valued at \$44,794,000, and canned lobster imports at \$5,239,000.

Fresh or Frozen Groundfish and Ocean Perch Fillets and Blocks: Imports in this category declined from \$38,759,000 in 1959 to \$33,265,000 in 1960. Frozen fish blocks constituted 56 percent of the total. Canada, Iceland, Norway, and Denmark were the major suppliers of imported fillets and blocks.

Tuna: In 1960, the value of frozen tuna imports was \$31,713,000; the value of canned tuna, \$19,142,000. Japan supplied 65 percent of the value of the fresh and frozen tuna and 86 percent of the canned tuna. A significant increase occurred in imports of canned tuna from Spain, Portugal, and Peru.

Fish Meal: Imports during 1960 were valued at \$11,068,000. In order of importance, Peru, Canada, Chile, and South Africa Republic were the principal suppliers. Angola, formerly a leading supplier, had a poor production year.

Table 6 - U. S. Duties Collected on Fishery Imports and Average Ad Valorem Equivalent

Year	Duties Collected	Average ad Valorem Equivalent
	US\$1,000	Percent
1960	15,857	4.3
1959	17,737	4.8
1958	16,645	5.1
1957	15,955	5.4
1956	15,504	5.5

Duties Collected: Duties collected on fishery products imported by the United States in 1960 were \$15,857,000, or 11 percent lower than the total collected in 1959. The average ad valorem equivalent of the duties collected has continued to decline over the last several years (table 6).

* * * * *

U. S. COMMERCIAL ATTACHES TO PURSUE EXPORT SALES VIGOROUSLY:

Commercial Attaches at U. S. Missions overseas are going to get more and better backing from the Commerce and State Departments than ever before. However, they will be expected to bolster President Kennedy's Export Expansion Program through new, aggressive efforts to increase sales of United States products in the countries to which they are assigned.

This was the principal emphasis at a five-day conference concluded early in December 1961 in London between 22 commercial officers from U. S. Missions in 17 Western European countries and a delegation of top officials from the Commerce and State Departments. As Under Secretary of Commerce Edward Gudeman, leader of the Washington delegation put it:

"We want new ideas from you. That includes criticisms of existing procedures which aren't producing results or are wasting your time. We're going to try to get things done that you want us to do. I can assure you that we're going to be responsive to your requests as never before."

At the conference were commercial officers representing posts in London, Copenhagen, Reykjavik, Bonn, Madrid, Paris, Oslo, Bern, Brussels, Dublin, Helsinki, The Hague, Vienna, Stockholm, Portugal, Rome, and Belgrade.

The Conference focused its attention on (a) a review of the new responsibilities of

the Commercial officers in promoting the Commerce Department's Expansion Program, (b) details of the Department's new plans and program in the field of international affairs, and (c) the effectiveness of the Department's current services to U. S. businessmen and its export promotion activities.

The new and increasingly important role of the commercial attache in helping to carry out the Department's export expansion drive received special attention in the conference sessions.

Members of the Washington delegation made it clear they are determined to free the commercial attaches from routine tasks to concentrate on making contacts in the business communities of the countries to which they are assigned. This will permit greater opportunity for location of new markets for new products and new ways of selling them. No longer is it sufficient for the commercial officer simply to reply to inquiries from individual businessmen. Instead, the Washington group said, they must take the lead in alerting United States business to new opportunities for sales abroad. In addition, they must be particularly watchful for export opportunities for American businessmen who have never sold in overseas markets before.

The Washington delegation urged the commercial officers to make new and vigorous efforts to help eliminate obstacles to imports of United States products in the countries to which they are assigned. They will be expected to take a "hard sell" approach in behalf of the Commerce Department's export expansion program.



Whaling

U. S. PRODUCTION OF WHALES AND PRODUCTS:

Preliminary 1961 data show that the United States whale catch totaled 316 whales. The whales were taken by 6 whale catcher boats operated by 3 shoreside plants. Two of the plants are at Point San Pablo in San Francisco Bay, Calif., while the third plant is located at Warrenton, Oregon. The Oregon plant started operations in 1961.

The 1961 catch is reported as the best since the rebirth of United States west coast whaling in 1956.

The 1960 total catch of 271 whales was 38 whales, or 12 percent, less than the 1959 catch of 309 whales (see table 1).

Table 1 - U. S. Whale Catch, 1960 and 1959

Species	1960	1959
	Number	Number
Blue	1	5
Bottlenose	2	2
Fin	138	106
Humpback	67	140
Sei	47	39
Sperm	16	17
Total	271	309

By species, the catch of humpback whales declined the most, dropping from 140 in 1959 to 67 in 1960, a decrease of 52 percent. The fin whale catch of 138 in 1960 increased 32 whales over the 1959 catch.

The 1960 production of whale meal, oil, and meat totaled 10.3 million pounds, a decrease of 1.1 million pounds as compared with 1959. The 1960 value of those products totaled \$672,000, a decrease of \$203,000 or 23 percent (see table 2). Depressed prices for meal and oil in 1960 accounted for the large decrease in the value of the products.

Table 2 - U. S. Production of Whale Products, 1960 and 1959

Product	1960		1959	
	1,000 Lbs.	US\$1,000	1,000 Lbs.	US\$1,000
Meal	2,973	135	3,763	263
Meat	4,010	362	3,722	347
Oil:				
Sperm	170	10	171	12
Whale	3,109	165	3,739	253
Total	10,262	672	11,395	875

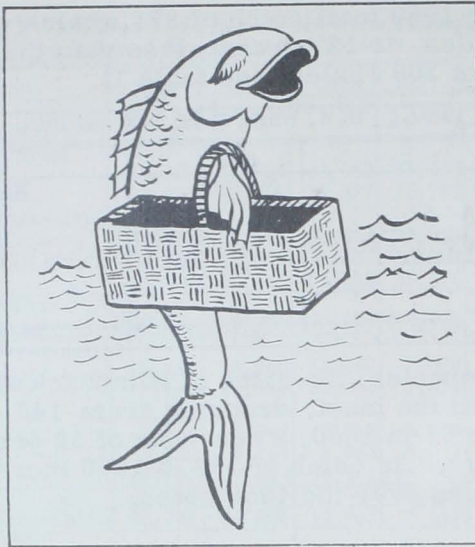
During both 1959 and 1960 only 2 firms in the San Francisco Bay area engaged in whaling in this country. The red meat of whales is ground up and frozen mostly for use as mink feed. Small quantities are used in the canned pet feed industry.



Wholesale Prices, November 1961

Wholesale prices for edible fish and shellfish in November 1961 were up 2.2 percent from the previous month and 7.3 percent higher than in the same month of 1960, according to the wholesale price index for edible fishery products (fresh, frozen, and canned). There was a steady increase in prices April through November 1961 except for a slight dip in September.

Higher prices in November 1961 than the previous month for whitefish and yellow pike at Chicago and New York City, respectively, more than offset the drop of 8.1 percent in the prices of large drawn fresh haddock at Boston. The drawn, dressed, or whole finfish subgroup during that period was up only slightly. November 1961 prices for the subgroup in general were down 7.5 percent as compared with the same month in 1960. But the movement of the individual items in the sub-



group was mixed. Prices were down substantially for fresh drawn haddock at Boston (down 25.7 percent), frozen king salmon at New York City (down 5.5 percent), and yellow pike at New York City because of greater landings. Those lower prices were more than offset by higher prices for frozen dressed halibut at New York City (up 17.3 percent) and whitefish at Chicago.

Among the processed fresh fish and shellfish prices there was very little change from October to November 1961. Oysters became more plentiful as the season progressed and prices were down slightly. Compared to a year earlier, November 1961 prices for the subgroup were 12.1 percent higher. A 26.0-percent rise in fresh large shrimp prices at New York City and a 5.0-percent rise in prices of shucked oysters at Norfolk were responsible. The increases were partly offset by a drop of 17.1 percent in fresh haddock fillet prices at Boston, which followed the same downward trend as fresh drawn haddock.

Processed frozen fish and shellfish prices in November 1961 were up 2.6 percent from the previous month because of a 6.1-percent increase in small haddock fillet prices at Boston and an increase of 1.7 percent in frozen shrimp prices at Chicago. Compared with a year earlier, the increase for the subgroup was 12.0 percent because lower supplies of frozen shrimp, and haddock and ocean perch fillets caused the prices of those products to rise. However, in that period there was a slight drop in flounder fillet prices.

Canned fishery products prices in November 1961 were up 4.0 percent from the previous month and 10.6 percent from a year earlier. All items in the subgroup were priced substantially higher than a year earlier--canned tuna up 9.5 percent, canned Maine sardines up 44.8 percent, canned California sardines up 27.4 percent, and canned salmon up 9.5 percent. Demand for all canned fishery products has remained steady and in the case of tuna has increased. The 1961 packs of canned tuna and salmon were higher than the previous year, but the packs of California sardines and Maine sardines were down critically.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Nov. 1961	Oct. 1961	Nov. 1961	Oct. 1961	Sept. 1961	Nov. 1960
			ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					141.1
Fresh & Frozen Fishery Products:					154.6	153.0	151.4	146.9
Drawn, Dressed, or Whole Finfish:					153.0	152.5	150.0	165.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.11	98.5	107.2	95.2	132.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.35	108.3	107.3	120.7	92.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.85	.85	191.0	191.0	188.2	202.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.83	.69	204.6	171.1	130.2	185.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.48	.45	111.4	105.5	140.7	164.1
Processed, Fresh (Fish & Shellfish):					158.8	158.6	155.7	141.7
Fillets, haddock, sml., skin on, 20-lb. tins	Boston	lb.	.34	.32	115.7	108.9	105.5	139.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.88	.87	138.3	136.7	140.6	109.8
Oysters, shucked, standards	Norfolk	gal.	7.88	8.00	194.9	198.0	185.6	185.6
Processed, Frozen (Fish & Shellfish):					133.9	130.5	130.9	119.6
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	103.4
Haddock, sml., skin on, 1-lb. pkg.	Boston	lb.	.35	.33	109.9	103.6	103.6	106.7
Ocean perch, lge., skin on 1-lb. pkg.	Boston	lb.	.30	.30	120.8	120.8	120.8	118.8
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.90	.88	138.1	135.8	136.6	114.2
Canned Fishery Products:					121.8	117.1	116.4	110.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	143.5
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	11.65	87.6	84.0	82.9	80.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.90	4.90	114.4	114.4	110.9	89.8
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.31	10.31	131.0	109.7	109.7	90.5

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

