

TRENDS AND DEVELOPMENTS

American Samoa

NATIVE FISHERMEN LEARNING LONG-LINE TUNA FISHING TECHNIQUE: The native American Samoans are learning the long-line method of tuna fishing, which the Japanese have successfully developed. A former naval 50-foot tender has been made available for the project, and the Samoan fishermen have demonstrated their ability to catch big fish on a limited commercial scale. The only limit now seems to be imposed by their boats and fishing gear, and it has been rumored that the idle *M/V Samoa* may be leased by the Government of American Samoa for use as a fishing vessel.

The Samoan crew fishes off Tutuila, in sight of land, and disposes of its catch by selling tuna to the local cannery, and other types of fish are sold in Pago Pago direct to the local population for 10 cents a pound.

The Governor of American Samoa takes a close personal interest in the possibility of developing commercial fishing as a major Samoan industry. He has arranged permission to appoint each year a candidate from American Samoa to the U. S. Maritime Academy in New York on a full scholarship basis with all traveling and tuition expenses paid. This program should provide qualified Samoan masters of future fishing vessels.

Looking beyond the Samoan group, the Governor sees the possibility of Fijians, Tongans, and other South Pacific Islanders joining in a large scale commercial-fishing operation, reaping direct benefit from the valuable fish which abound in their waters.

A substantial amount of fish is being caught by Japanese fishermen in South Pacific waters for sale to the American Samoa cannery operated on a lease basis by a large United States west coast canner. The Governor feels that the Samoan people should have an opportunity to share in this growing industry.

The fishing industry has been a great boon to American Samoa. The Pago Pago cannery employs between 350 and 400 local people in the processing and packing of the tuna which 30 to 40 Japanese fishing vessels deliver to the cannery regularly.

The cannery's payroll is estimated to contribute a quarter of a million dollars annually to American Samoa's national income. More than any other factor, the cannery operation gives back to American Samoa the prosperity it lost when the U.S. Navy closed down its base in Pago Pago in 1950 (*Samoa Bulletin*, March 28, 1958).

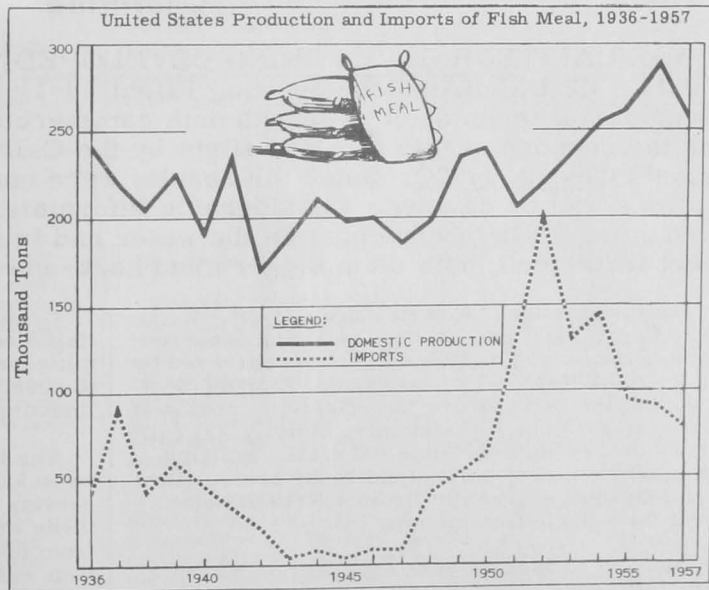


Byproducts Production for U. S. & Alaska in 1957

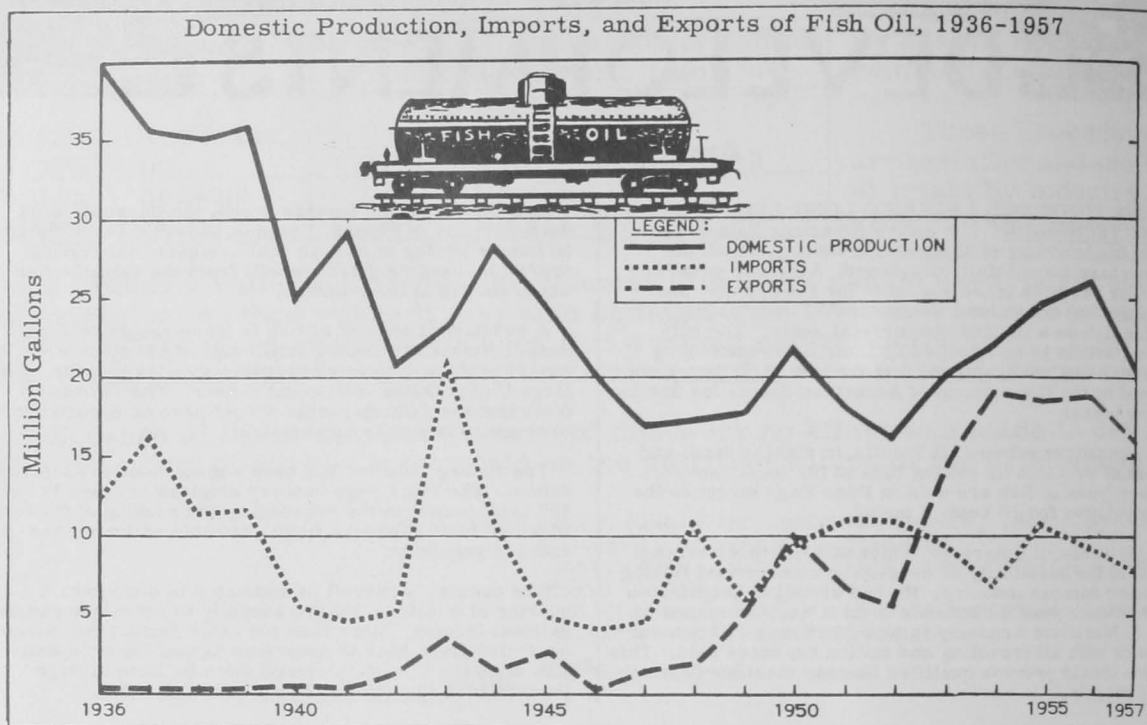
The United States and Alaska production of fish meal and scrap amounted to over 262,000 tons during 1957--a decline of 33,000 tons or 11 percent as compared with 1956. The production during June-August made up nearly 50 percent of the year's total.

Imports of fish meal during 1957 amounted to 81.2 thousand tons as compared with 91.4 thousand tons imported during 1956.

Production of fish oil during 1957 totaled 20.1 million gallons, compared with 26.8 million gallons during 1956. A drop in the production of oil from menhaden--down 6.6 million gallons--was largely responsible for the overall reduction in oil.



The yield of fish solubles during 1957 amounted to 187.8 million pounds. This represented a decline of 10.3 million pounds as compared with 1956. During 1957, the production of homogenized-condensed fish amounted to 56.8 million pounds--a drop of 2.8 million pounds as compared with the previous year.



California

AERIAL TECHNIQUES BEING DEVELOPED TO CENSUS COMMERCIAL AND SPORT FISHING (Airplane Spotting Flight 58-1): To establish procedures for applying aerial techniques to census both commercial and sport fishing operations was the purpose of this airplane flight by the California Department of Fish and Game's *Cessna 3632C*. Since the results were encouraging, future aerial scouting routines will be devised. Considerable information was obtained on the possibilities of counting units of crab gear in the water and in making instantaneous counts of sport fishermen, both clam diggers and hook-and-line fishermen.

The inshore area between Yankee Point, Monterey County, and Bodega Bay, including San Francisco, Drakes, and Tomales Bays was surveyed by air to: (1) Establish procedures for applying aerial techniques to censusing the crab fleet, crab gear in operation, and sport clamming activity. (2) Tally the number of hook-and-line fishermen utilizing the beaches, piers, jetties, and rocky areas. (Dingell-Johnson Federal Aid Project F-12-R). (3) Scout for pelagic fish schools.

Weather conditions were excellent on March 2, with very clear skies and calm water prevailing over the entire area. On the 3rd rain showers prevented scouting until 10 a.m. but thereafter weather conditions were comparable to those on the previous day.

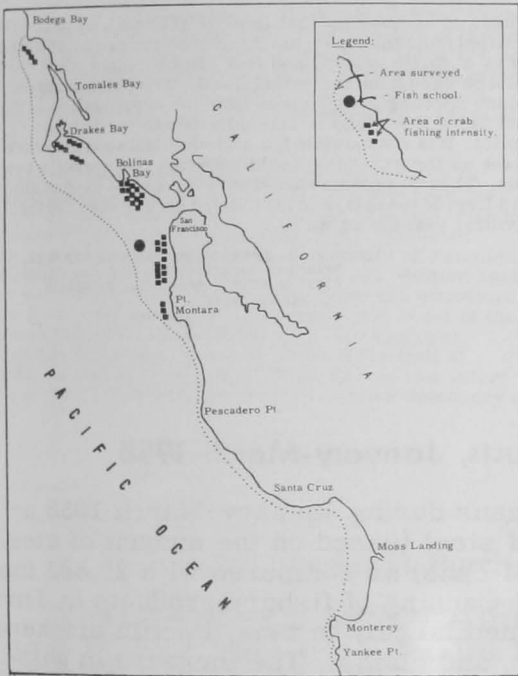
Crab Fishing Census: The crabbing area from Half Moon Bay to Bodega Bay was flown to determine the techniques of aerial censusing applicable to counting crab gear and crab boats as well as delineating the area of crab fishing activity.

The buoys of crab traps were visible at altitudes up to 2,000 feet. However, accuracy in survey observing would be best at 800 to 1,000 feet. Pictures were taken over the buoys at several altitudes from 800 to 2,000 feet. Infrared and Kodachrome film was used to determine which film would most clearly show the buoys on the surface of the ocean.

Twenty-one strings of traps consisting of 24 to 45 units were observed. These traps were set over sandy bottoms from Half Moon Bay to Bodega Bay

at distances of one-half to four miles from shore. The greatest concentrations of gear were off Stinson Beach, Marin County, and the Lake Merced-Westlake section of San Francisco.

On March 3 the same area of ocean was covered by air observation of crab boats. The boats were identifiable as crab boats either while tending gear or running to port. Twenty crab boats were observed. However, since all boats do not operate on the same time schedule, the total boats fishing on a given day would not be obtained by one flight on any day.



AIRPLANE FLIGHT 58-1, MARCH 2-3, 1958.

An estimate of the area covered by the crab fleet and the effort expended can be made by censusing the gear as set. A special flight pattern

and counting procedure can be used to reveal the approximate number of traps fishing at any one time. Such a census taken at 3- to 4-week intervals would reveal the fishing effort expended over a given area.

Clam Digging Census: During the period of the March 2 afternoon minus tide, a count of sport fishermen engaged in clam digging was made from Bodega Bay south to the mouth of the Salinas River. The total count was 909 persons. The clambers counted digging various species in bays and lagoons numbered 330. Those on the ocean beach after Pismo clams totaled 579.

This aerial census of clam-digging activity is the first that has been made for this area of the California coast. The count represents the number of persons observed to be harvesting clams at the time the flight was made. This does not allow for turnover of fishermen during the several hours of clamming during the low tide period. Therefore, it is recognized that the count of clam diggers during the flight is considerably less than the total number of persons harvesting clams during low tide period.

The use of aerial techniques in censusing clam-digging activity is considered to be of great value in assessing the public use of the clam resources.

Hook-and-Line Sport Fishing: A total count of all hook-and-line sport fishermen on the beaches, rocky shore, jetties, and on some of the piers was made in conjunction with turnover counts being conducted by personnel on the ground at certain key areas along the shore.

Because of the large numbers of anglers on the piers on March 2 and also due to the fact that turnover counts were being conducted at several of the piers, all the piers were not counted on each day.

Pelagic Fish Census: Despite calm seas and excellent visibility only one pelagic fish school was observed over this entire area. This small school was sighted off San Francisco about two miles from shore. Species identification was not possible.

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AERIAL FISH SPOTTING UTILIZED BY SOME CALIFORNIA VESSELS: Some California vessels regularly and others erratically utilize planes to aid them in spotting fish. All of the plane spotters operate as independent contractors and they are hired by the vessels. There is no cannery, market, or any other commercial processing plant that hires plane spotters. This is probably due to the fact that in California there are only a few vessels that are owned and totally-controlled by canners. Practically all of the vessels operate individually and have contracts with canners for their fish catches.

Most of the spotters, at the present time, sell their services to the individual fishing vessel owners and their crews. The agreement for payment between the vessel owners and crews and the plane spotters provides for two different arrangements, depending upon which the parties prefer. One arrangement is that the plane spotter receives 7½ percent of the gross proceeds of the catches the vessel makes as a direct result of the spotter setting them on the fish. The other arrangement is that the vessel pays the fish spotters 5 percent of the gross proceeds of all the fish the

vessel catches, whether or not the plane spotter is responsible for the catch.

The number of spotters varies greatly. It depends upon the season, availability of fish, and skill. At the present time, however, there are 8 pilots or spotters operating out of San Pedro. Although during the height of the sardine season there will be as many as 15, only a very small percentage of these pilots spot for fish on a full-time basis. Most of them have other jobs and drop in and out of plane spotting, depending upon whether they can make any money or not.

The equipment most of them use consists of a small light plane, such as a Piper or a Cessna, which is equipped with a two-way radio. None of the planes presently operating are float planes. Although float planes have been used in the past, they are considered impractical due to the extra maintenance costs. Two amphibious planes were also used in the past, one a "Widgen" and the other a "See-Bee." Both these planes proved to be expensive to operate and maintain and dropped out.

The spotter pilots fly their planes all hours of the day and night. It is not uncommon for them to be aloft for periods up to 7 hours at a stretch and during the season the fliers will spend as many as 16 hours a day aloft. The operations range from Point Conception, with occasional trips farther North, and south to San Diego. They search all the channel islands which lie from 15 to 60 miles offshore and also explore banks as far as 90 miles offshore. Flying these distances offshore in light airplanes and at night is extremely hazardous, yet only two men have been lost in Southern California since 1946, when plane spotting for fish started.

Several methods of operation have been tried in the past, but the most successful seems to be a plane which has 5 or 6 "steady" vessels. The spotter reports exclusively to these vessels, usually in code. Handling more than this number of vessels causes arguments and difficulty, as fishermen continually harass the pilot claiming he favors one vessel against the others, etc.

While plane spotting for fish appears to be successful in that numerous catches are made by fishermen when they cannot see the fish because the spotter directs the setting of the net from the air, there is still pessimism on the part of some as to whether or not more fish is actually caught on an annual basis by those vessels assisted by plane spotters. There is no doubt that if an individual vessel would operate exclusively with one plane he would do better, but the way the planes are spread out among the vessels it is difficult to accurately gage the net results.

Plane spotters were also used in the clipper bait-boat fleet fishing for tuna. Although they operated for several years and some results were reported, all of them have been abandoned. The chief use of planes by the clipper fleet was in the location of bait. When the clipper had to sail inshore to find bait, it could be directed to a location where bait was available. This saved much running around. The spotting of tuna also proved helpful, but schools of tuna move so rapidly that information as much as an hour away is generally worthless, for by the time the vessel reached the fish they had moved. Other reasons for the abandonment was the high cost of maintenance, the difficulty of hoisting the planes aboard on the high seas, difficulty encountered in making landings on the high seas, and the reluctance of pilots to take these jobs, because conditions were hazardous.

There is no question that fish can be readily spotted and identified from the plane, much wider areas can be covered than by a single vessel, and fish can be caught when they cannot be seen from the vessel itself. The chief problem of plane spotting in California is in the organization of the effort being made and is basically due to the returns to the pilot. It is not feasible for an individual vessel to hire a plane as the expenses would outweigh the vessel's proceeds. Thus it becomes necessary for a pilot to operate with a fleet of vessels, and in so doing he cannot serve the individual vessels as well.

—BY A. D. SOKOLICH, MARKET NEWS REPORTER,
BRANCH OF MARKET NEWS,
U. S. BUREAU OF COMMERCIAL FISHERIES,
SAN PEDRO, CALIF.



Cans--Shipments for Fishery Products, January-March 1958



Total shipments of metal cans during January-March 1958 amounted to 22,772 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 20,882 tons in the same month a year ago. Canning of fishery products in January-March this year was confined largely to tuna, Pacific mackerel, anchovies, shrimp, Gulf oyster, and clams. The increase in shipments in the first quarter of 1958 as compared to the same quarter of 1957 is due to the expectations of more activity in tuna and salmon canning this year.

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.



Coast & Geodetic Survey

CHARTING OF COASTAL WATERS BEGINS: The Coast and Geodetic Survey, U. S. Department of Commerce, announced on April 1, 1958, that the major units of the Survey's fleet were due to sail for summer surveying assignments along the country's coasts.

Since the Survey was founded in 1807 steady progress has been maintained in surveying and charting more than 90,000 miles of coastline. Some of the areas scheduled for this summer, especially in Alaska, have never been charted in detail. Even along our much-traveled Atlantic coast, threats to navigation are present in the form of recent wrecks, shoreline changes, and dangerous shoals.

Survey officials stated that these changes, as well as new lights, buoys, and other aids to navigation must be noted on the Survey's charts as they are published.

Due to the urgent demand for surveys in some areas, four of the Survey's ships were already at work prior

to April 1. Those in southern waters continued operations throughout the winter.

Sailing dates and ports of departure for 10 of the Survey ships were as follows:

St. Petersburg, Fla.: April 3, the Hydrographer, sailed to Georges Bank in the Gulf of Maine to complete a survey that was started in April 1957. It is the first to be made of this important fishing ground in the vicinity of Georges Bank and Nantucket Shoals in 26 years.

Norfolk, Va.: April 2, the Survey ship Cowie, resumed surveys in the lower Chesapeake Bay in the vicinity of Onancock Creek and southward. It is expected that this project will be completed before the close of the season and the ship will be moved to the entrance to the Potomac River.

April 7, the Hilgard and Wainwright, also at Norfolk, were assigned to complete "wire-drag" operations that

were started last season in the vicinity of Isle au Haut, Maine. The ships will also undertake a hydrographic survey off Schoodic Peninsula, Maine, near the Acadia National Park. A wire-drag is a metal cable that, when pulled through the water at a predetermined depth by two vessels, detects uncharted rocks or wrecks that may be hazards.

Seattle Wash: April 2, the Bowie, has been assigned to the Columbia River area. The Bowie is supported by the West Coast Field Party utilizing hydrographic launches.

April 7, three of the surveying ships sailed from this port for southeast Alaska. They are the Hodgson, the Patton, and the Lester Jones.

April 9, the Pathfinder, one of the Survey's largest ships, was making a wire-drag survey of Guemes Channel in Puget Sound. The survey is being made at the request of the Texas Company to assure that there are no obstructions for the deep draft tankers which will bring in Middle East oil to the Company's new refinery on Fidalgo Island. The channel will be swept to a depth of 50 feet.

April 16, the Pathfinder sailed for Kasaan Bay in southeast Alaska where it will complete a survey project before departing for Dutch Harbor, Aleutian Islands. En route to Dutch Harbor the Pathfinder conducted oceanographic investigations in the vicinity of Pamplona sea ridge, lat. 59°32' N., long. 142°35' W. Bottom samples were obtained by dredging and deep-sea soundings were made. She will then survey the north coast of the Alaskan Peninsula. Her sister ship, the Explorer, sailed directly to the Aleutians, across the Gulf of Alaska. It was from crossings such as this that information was pieced together which led to the discovery of

an extensive crack on the Gulf's floor last September. The Explorer will concentrate on Atka Pass and the south coast of Atka Island.

An electronic distance-measuring device, the Tellurometer, which was field tested in the Aleutians last season and later used on the Interstate Highway surveys in this country, will be used to establish the control points for Explorer's survey along the north and south sides of Amlia Island.

Four ships at work prior to April 1 are: The Marmer, which is now making a circular survey of New York Harbor. The Gilbert, making a current survey of Georgetown Harbor, S. C. The Sosbee, is continuing a survey of Tampa Bay, Fla., which should be completed within a year. One unit of the East Coast Field Party, which has been supporting the Sosbee in Tampa Bay, left St. Petersburg about April 1, to survey a portion of the St. Johns River adjacent to the Naval Air Station at Jacksonville, Fla. The last survey to be made in the area was in 1934-35. The Scott is now making an inspection of the east coast from Norfolk, Va., to Key West. The information will be used in revisions of the Coast Pilots which are books that contain detailed information to supplement the charts.

The Coast and Geodetic Survey's responsibility for charting the coastal waters of the United States and its possessions involves over 90,000 miles of tidal shoreline and about 25 million square miles of water area. In order to accomplish this task the Survey has resorted to modern electronic instruments such as Raydist, Shoran, and the Electronic Position Indicator which are used to determine the ships position. The water's depth is determined by the sonic depth recorder, another electronic device that accurately measures the time it takes a sound wave to travel to the bottom and return as an echo.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1958: Fresh and Frozen Fishery Products: A total of 2.2 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in April 1958 for the use of the Armed Forces under the Department of Defense by the Military Subsistence Market Centers. The April 1958 purchases were higher than the purchases in the preceding month by 31.4 percent and above the same month in 1957 by 21.5 percent. The value of the purchases this April exceeded the March 1958 purchases by 18.1 percent and the April 1957 purchases by 22.7 percent.

Table 1 - Fresh and Frozen Fishery Products, Purchased by Military Subsistence Market Centers, April 1958 with Comparisons

QUANTITY				VALUE			
April		Jan.-April		April		Jan.-April	
1958	1957	1958	1957	1958	1957	1958	1957
.....(1,000 Lbs.)			(\$1,000)			
2,232	1,837	7,256	7,376	1,190	970	4,142	3,832

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, April 1958 with Comparisons

Products	QUANTITY				VALUE	
	April		Jan.-April		April	Jan.-April
	1958	1957	1958	1957	1958	1958
.....(1,000 Lbs.)						
Tuna . . .	543	-	955	841	264	482
Salmon .	86	-	1,327	992	51	724
Sardine .	9	12	33	31	4	12

For the first four months of 1958 purchases totaled 7.3 million pounds, valued at \$4.1 million--a decrease of 1.6 percent in quantity, but 8.1 percent higher in value as compared with January-April 1957.

Canned Fishery Products: Tuna was the principal canned fishery product purchased by the Military Subsistence Mar-

ket Centers in April 1958. During the first four months of 1958 the total purchases of canned fish were up 24.2 percent from the same period of 1957.

NOTE: SOME LOCAL PURCHASES ARE NOT INCLUDED. ACTUAL PURCHASES ARE HIGHER THAN INDICATED BECAUSE IT IS NOT POSSIBLE TO OBTAIN LOCAL PURCHASES.



Fisheries Loan Fund

LOANS THROUGH MAY 14, 1958: As of May 14, 1958, a total of 436 applications for fisheries loans totaling \$15,905,558 had been received. Of these 220 (\$5,701,592) have been approved, and 124 (\$3,485,246) have been declined. As several applications have been deferred indefinitely at the request of the applicants, sufficient funds have been available to process all applications received to date. Unless the amount of funds applied for increases unexpectedly, funds will be available to process applications received during the next two months without delay.

The following loans have been approved between July 1, 1957, and May 14, 1958:

New England Area: Kenneth L. Lovett, Rye, N. H., \$4,500; Franklin L. Libby, Beals, Me., \$3,000; Charles A. Bennett, Provincetown, Mass., \$6,000; Samuel Cottle, Jr., Wakefield, R. I., \$27,825; Bluewaters, Inc., Gloucester, Mass., \$53,000; Pasquale Maniscalco, Somerville, Mass., \$43,195; Harmon Tibbetts, Jr., Boothbay Harbor, Me., \$2,000; Silver Sea Inc., Portland, Me., \$42,282; O'Hara Bros. Co., Inc., Boston, Mass., \$102,800; Vandal, Inc., Portland, Me., \$25,000; Gerald L. Small, Owls Head, Me., \$1,000; Cumberland Fisheries, Portland Me., \$46,000; Salvatore Passanisi, Somerville, Mass., \$53,300; Lorenzo Sossanno, Gloucester, Mass., \$40,000; Muskegon, Inc., Portland, Me., \$32,000; Boat M. C. Ballard, Inc., Boston, Mass., \$39,910; Trawler Bonnie Billow, Inc., Boston, Mass., \$35,062; Warren S. Martin, Portland, Me., \$6,000; Cleary Corp., New Bedford, Mass., \$51,500; Lubenray Inc., Fairhaven, Mass., \$39,500; Boat Camden Inc., New Bedford, Mass., \$34,600; Robert McLellan, Boothbay Harbor, Me., \$23,500; John Bruno & Son Co., Inc., Boston, Mass., \$27,121; Boat Mary Anne, Inc., New Bedford, Mass., \$40,000; Charles C. Miller, Point Pleasant N. J., \$20,469; James Maniscalco, Somerville, Mass., \$36,000; Albert M. Bridges, Brooklin, Me., \$4,000; John Field, Monhegan Island, Me., \$3,000; Attilio Marchetti, Newport, R. I., \$8,500; Henry S. Powell, Waldoboro, Me., \$7,000; Segura & Segura, Provincetown, Mass., \$7,684; John Wright Morton II, Scarborough, Me., \$12,000; Marco A. Giacalone, Boston, Mass., \$36,000; and Cosimo Parco, Gloucester, Mass., \$35,000; total, \$948,748.

Middle Atlantic Area: Charles H. Smyth, Jr., Absecon, N. J., \$4,000.

South Atlantic and Gulf Area: E. H. Holton T/A, Vandemere, N. C., \$125,000; Valcour Vizier, Cut Off, La., \$19,306; W. C. Mobley, Aransas, Tex., \$24,000; Fred F. Sanders Seafood, Inc., Savannah, Ga., \$49,324; J. H. Morgan, McIntosh, Ga., \$20,000; Louie Rash-Cecil Drake, Pascagoula, Miss., \$32,000; Wm. Milton Anders, Kemah, Tex., \$15,500; Paul V. Pitre & Louis J. Pitre, Cut Off, La., \$28,000; Billy Jay Brown, New Orleans, La., \$10,991; Monroe & Guy Taylor, Sea Level, N. C., \$18,569; Richard H. Jones, Fernandina Beach, Fla., \$16,000; Hilton Toomer, Key West, Fla., \$14,000; Richard W. Marshall, Gulfport, Miss., \$5,800, and Robert D. Smallwood, Jr., Everglades, Fla., \$24,500; total, \$402,990.

California: Darrell D. Foreman, Costa Mesa, \$10,000; Charles E. Graham, San Diego, \$5,000; Malcolm S. Rice, San Diego, \$87,780; R. Carpenter & Sons, Bodega Bay, \$10,000; Anthony F. Bozanich, San Pedro, \$30,000; Grover V. Nell, San Diego, \$8,900; Nick Trutanich, San Pedro, \$68,000; Josie Scuito, San Diego, \$75,000; N. F. Trutanich, San Pedro, \$130,000; Charles L. & Catherine N. White, San Diego, \$1,383; Floyd A. Hill, San Diego, \$4,975; and Michael F. Schroeder, Aptos, \$4,363; total, \$435,401.

Hawaii: John A. Hodges, Lanikai, Oahu, \$9,000; Harold Fujiwara, Waialua, Oahu, \$7,290; and Mitsuo Higashi, Waimea, Kauai, \$3,250; total, 19,450.

Pacific Northwest Area: Grant U. Baldwin, Westport, Wash., \$2,500; K. R. Thomas, Chehalis, Wash., \$7,000; A. T. Davies - Tuna Vessel Commander Inc., Tacoma, Wash., \$47,187; A. T. Davies, Seafarer, Inc., Tacoma, Wash., \$66,872; Kaare Angell, Snohomish, Wash., \$10,000; Richard Branshaw, Tokeland, Wash., \$5,000; Martin L. Smith, Rockaway, Ore., \$6,000; Clarence R. Bushnell, Tokeland, Wash., \$9,634; John W. Nevill, Seattle, Wash., \$3,200; Albert A. Anderson, Seattle, Wash., \$2,500; Robert Egelkrout, Burlington, Wash., \$15,000; John W. Nevill, Seattle, Wash., \$1,575; Frank E. Deiner, Edwards, Wash., \$2,500; Lawrence T. Fleming, Chehalis, Wash., \$3,500; Cal Scott Cutler, Westport, Wash., \$1,650; Boat Daily, Seattle, Wash., \$10,000; James H. Cope, Seattle, Wash., \$15,000; Erling Jacobsen, Seattle, Wash., \$22,000; Joseph & Peter Evich, Bellingham, Wash., \$25,000; and Samuel E. Hendricksen, Seattle, Wash., \$10,000; total, \$266,118.

Alaska: Gerald G. Bennett, Ketchikan, \$1,200; Charles E. Swan, Douglas, \$750; Allen Sandstrom, Cordova, \$2,500; and Orville F. Wagner, Idaho Inlet, \$8,000; total, \$12,450.

Great Lakes Area: William Brown, Crosswell, Mich., \$8,000.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, AUGUST 1957, P. 18.



Fishery Marketing Specialist GS-5 Examination

The U. S. Civil Service Commission announced on February 18, 1958, Announcement No. 156 (B), an assembled examination for positions of Fishery Marketing Specialists, GS-5 (\$3670 a year). A list of places where examination will be held accompanies this announcement. The examination remains open until further notice.

The positions to be filled from this examination are located in the U. S. Fish and Wildlife Service of the Department of the Interior, and other Federal agencies in Washington, D. C. and throughout the United States, its Territories and possessions.

Fishery Marketing Specialists' work relates to fishery production and marketing. The duties involve investigation and market research concerning commercial fisheries or fishery commodities; also perform work relating to Fishery Market News reporting services--collection, analysis, and dissemination of information relating to production, supply, demand, movement, distribution, prices, and other phases of marketing. In some of these positions a small amount of typing is expected.

Except for the substitution of education for experience, applicants must have had 3 years of responsible experience in any position involving (a) the collection and compilation of market information and statistics on fishery products and the preparation from such data of analytical articles or bulletins for publication; or (b) marketing research requiring knowledge of commercial methods and practices in producing, processing,

Announcement No. 156 (B)
 Issued: May 6, 1958
 No Closing Date

The United States Civil Service
 Commission
 Announces an Examination for

**Fishery
 Marketing
 Specialist**

\$3,670 a Year

(Grade GS-5)

APPLY TO
 Executive Secretary
 Board of U. S. Civil Service Examiners
 Fish and Wildlife Service
 Department of the Interior
 Washington 25, D. C.

transporting, or marketing of fishery products; or (c) accounting, market promotional, or production activities in the fisheries requiring a good knowledge of methods and practices in that field. The experience must have been of a progressively responsible nature.

Study successfully completed at an accredited college or university may be substituted for experience as follows: (1) Four years of study which included courses as shown in (a) or (b) below may be substituted for a maximum of 3 years of experience: (a) At least 10 semester hours or 15 quarter hours in fisheries subjects. Majors may include fish and game management, fish and wildlife conservation, biology, and zoology. (b) At least 10 semester hours or 15 quarter hours in economics of food or marketing of food or in statistics. Majors may be economics, business administration, marketing or statistics. Less than 4 years of education may be substituted for experience at the rate of 1 year of education for 9 months of experience provided that such education included a proportionate number of semester hours in the qualifying subjects above. (2) Study with a major in economics or marketing in fields other than food may be substituted for experience at the rate of 1 academic year of education for 6 months of experience, not to exceed 2 years of the required experience.

Competitors for all positions will be required to take a written test designed to measure their ability to understand, learn, and interpret regulations and practices and in general, to perform the duties of the position. The test will include interpretations of written paragraphs, the meanings of words, arithmetic computations and problems, and some questions involving spatial ability. Samples of the tests on Form AN 3514 (see questions 1 through 8) will be furnished to applicants with their notices of admission to the written test. About 2 hours will be required for the written test.

Competitors will be rated on the written test on a basis of 100. To pass the written test, competitors must attain a rating of at least 70.

You must also show that you are a United States citizen; that you are physically able to do the work involved in the position for which you apply; and that you have reached your 18th birthday on the date of filing application. There is no maximum age limit for this examination.

For further information on how to apply for this examination write to any Civil Service Regional Office, or U. S. Civil Service Commission, Washington 25, D. C.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JUNE 1958, P. 27.



Florida

SHRIMP TAGGING PROGRAM: The multimillion dollar fishery for pink shrimp out of Key West, on the Tortugas grounds, depends on the shallow-water brackish areas at the southern tip of Florida for its supply of shrimp. The Everglades National Park area is part of the "nursery" grounds where tiny shrimp grow, protected from the dangers of oceanic life. When the shrimp get to be about 3-4 inches long they move seaward in enormous numbers. Later, when they become larger, they are caught by night-fishing trawlers out of Key West, Fort Myers, and other south Florida ports. The adult shrimp, as much as 7-8 inches long, spawn offshore and their microscopic larvae drift shoreward into Park waters.

Biologists of the Marine Laboratory of the University of Miami suspected that the large numbers of small shrimp seen in the Park waters were probably the young of the big shrimp caught offshore, but until recently this was not certain.

Then tag number 064, consisting of two kelly-green discs fastened to the shrimp by a nickel pin, came into the hands of a Marine Laboratory biologist. The tagged shrimp, which had been free 123 days, was caught on the fishing grounds 62 miles in a straight line from where it had been tagged in Coot Bay, a few miles north of Flamingo.

The shrimp, one of about 1,000 tagged in the Park area, had grown about 1-5 inches during the four months at large. This is an increase from about 100 "count" to 36 "count" in fishermen's language, meaning that it would have taken about 100 tails of shrimp the size it was when tagged to make a pound and only about 36 at the time of its capture to make a pound.

In addition to this tagging program, which is part of the research being conducted by the Marine Laboratory on the shrimp fishery for the Florida State Board of Conservation, shrimp have been tagged in the commercial fishery and returns have been surprisingly good. Between 25 and 30 percent of all tagged shrimp released have been captured a second time. The valuable information obtained on migrations and growth of the shrimp will eventually help conserve this great resource.



Fur-Seal Prices Advance at Government Spring Auction

An average advance of 8.9 percent in prices paid at the semiannual auction of Government-owned fur-seal skins marked the spring sale held in St. Louis on June 7. A total of 25,386 skins, products of the sealing industry administered by the Department of the Interior's Bureau of Commercial Fisheries on the Pribilof Islands of Alaska, brought \$1,809,272. This compares with 28,782 skins sold for \$1,983,208 at the October 1957 sale. The average for all skins sold for the account of the United States Government at the June 7 sale was \$71.27; the average at the October 1957 auction was \$68.90.

The Alaska skins included 7,568 black, 14,221 dyed "Mataras" (brown), and 3,597 of the newest shade called "Kitovi." The black skins sold at an average of \$81.04; Mataras at \$67.84; and Kitovis at \$64.26.

In addition to the United States skins, 11,324 South Africa fur-seal skins were sold for private shippers and the account of the Government of South Africa at an average of \$26.60, an advance of 3.4 percent; 500 Uruguay fur-seal skins were sold for the Government of Uruguay at an average of \$26.36.

The auction held at the show rooms of the Fouke Fur Company in St. Louis, Mo., normally set for April, was delayed because of a labor-management dispute at the Fouke plant.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1957, P. 21.



Great Lakes Fishery Investigations

FIELD TEST OF CHEMICAL FOR KILLING YOUNG SEA LAMPREY SUCCESS-

FUL: A successful field test of a chemical found effective in destroying young sea lamprey without harming fish was carried out on May 14, 1958, at Mosquito Creek, a well known rainbow trout stream flowing into Lake Superior about 15 miles east of Munising, Mich. The action of this particular chemical, one of several being investigated, had not previously been studied under stream conditions.

The chemical was fed into the stream above the areas infested with the parasite for eight hours. Young lamprey held in cages in the stream showed the effects of treatment within an hour and were all dead after seven hours of exposure. Lamprey in the stream were similarly affected and sampling crews found many dead, but no living lamprey, following the treatment.

Rainbow trout in the stream became restless, but only one casualty was observed and this a fish weakened by earlier sea lamprey attack. Several rainbow actually took anglers' lures during the treatment. Aquatic worms were killed by the chemical but the damage to insect larvae and other forms of stream life was negligible.

The test was carried out by the U. S. Bureau of Commercial Fisheries as part of the lamprey control program of the Great Lakes Fishery Commission.

Further testing will be carried out during the summer on larger streams where application will be more difficult. Should these tests continue to prove successful, the chemical technique will assume an important role in the early control of the sea lamprey which has destroyed lake trout in Lakes Michigan and Huron and is now rapidly reducing stocks of trout in Lake Superior.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JUNE 1958, P. 29.

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SURVEY OF WESTERN LAKE ERIE CONTINUED BY M/V "CISCO:" Studies on the life history of 15 important species of fish in western Lake Erie were continued by the Great Lakes Fishery Investigations research vessel Cisco. The major objective of the work by the Cisco during 1958 is to obtain as much information as possible concerning spawning habits, egg survival, hatching, fry survival, and early life history of the fish in western Lake Erie.

Cruise 1 (March 24-April 8, 1958): A record ice jam in southern Lake Huron caused a three weeks' delay in moving the Cisco from its winter base in Bay City, Mich., to Lake Erie. Thus cruise 1 was entirely eliminated and cruise 2 was late in getting started.

Cruise 2 (April 15-18): During this cruise, 4 special trawling stations, designated as "index" stations, were established. These stations will be visited several times each year to gather data that may be useful for predicting future abundance of marketable fish. The Cisco joined the Musky and an outboard motorboat in the "index" trawling operations. The "index" stations are located north of Stony Point, Mich., north of Bono, Ohio, east of South Bass Island, and east of Cedar Point, Ohio. Limnological data including water, plankton, and bottom samples were also collected at these stations.



CISCO, RESEARCH VESSEL OF THE SERVICE'S GREAT LAKES FISHERIES INVESTIGATION.

In addition to the "index" fishing, the Cisco also trawled in areas southeast of the Detroit River Light, south of Middle Sister Island, and north of Lorain. A catch of more than 5,000 smelt was made in one 10-minute drag near the Detroit River Light, but otherwise catches were generally light. Yellow perch predominated in most cases. Smelt catches were usually small because the majority of this species were in inshore spawning areas. Most of the smelt and perch taken were either in spawning condition or were freshly spent. The catches also included mooneye, white sucker, carp, emerald shiner, spottail shiner, silver chub, channel catfish, brindled madtom, burbot, trout-perch, white bass, walleye, blue pike, johnny darter, log-perch, and sheephead. The mature walleye were ripe or nearly so. Emerald shiners were the only species found off the bottom in any numbers. They were, in fact, apparently more numerous near the surface than near the bottom. A small plankton net attached to the trawl took no fish larvae.

A moderate degree of thermal stratification which had developed in the western basin of Lake Erie was broken up by high winds toward the end of cruise 2. Surface temperatures ranged from 6.2° C. to 13.7° C. (43.2° F. to 56.7° F.), except for somewhat higher temperatures at the mouth of the Raisin River.

Only common names will be used in the cruise reports. The following are common and scientific names of fish that will probably be taken in Lake Erie this year:

Common Names	Scientific Names
Alewife	<i>Alosa pseudoharengus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blue pike	<i>Stizostedion vitreum glaucum</i>
Brindled madtom	<i>Noturus miurus</i>
Brown bullhead	<i>Ictalurus nebulosus</i>
Burbot	<i>Lota lota</i>
Carp	<i>Cyprinus carpio</i>
Channel catfish	<i>Ictalurus punctatus</i>
Channel darter	<i>Percina copelandi</i>
Cisco (lake herring)	<i>Leucichthys artedi</i>
Emerald shiner	<i>Notropis atherinoides</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Goldfish	<i>Carassius auratus</i>
Johnny darter	<i>Etheostoma nigrum</i>
Lake sturgeon	<i>Acipenser fulvescens</i>
Logperch	<i>Percina caprodes</i>
Mooneye	<i>Hiodon tergisus</i>
Rock bass	<i>Ambloplites rupestris</i>
Sand darter	<i>Ammocrypta pellucida</i>
Sheepshead (fresh-water drum)	<i>Aplodinotus grunniens</i>
Silver chub	<i>Hybopsis storeriana</i>
Slimy muddler (sculpin)	<i>Cottus cognatus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Smelt	<i>Osmerus mordax</i>
Spoonhead muddler (sculpin)	<i>Cottus ricei</i>
Spottail shiner	<i>Notropis hudsonius</i>
Stonecat	<i>Noturus flavus</i>
Trout-perch	<i>Percopsis omiscomaycus</i>
Walleye	<i>Stizostedion vitreum vitreum</i>
White bass	<i>Roccus chrysops</i>
White crappie	<i>Pomoxis annularis</i>
Whitefish	<i>Coregonus clupeaformis</i>
White sucker	<i>Catostomus commersoni</i>
Yellow perch	<i>Perca flavescens</i>

Cruise 3 (May 6-19): Regular trawling stations in western Lake Erie east of South Bass Island, south of Rattlesnake Island, northwest of Pelee Island, south of Kingsville (Ontario), southeast and southwest of the Detroit River light, northeast of Monroe (Michigan), southwest of West Sister Island, south of Middle Sister Island, east of Sandusky (Ohio), and north of Lorain (Ohio), were visited during cruise 3. Tows will be repeated at these stations to follow changes in the distribution and composition of fish stocks. Limited trawling was also done in Sandusky Bay. Catches in nearly every case were predominately smelt and yellow perch. Emerald shiners, spottail shiners, and trout-perch were also taken often in large numbers. Species less common in the catches were silver chub, channel catfish, white bass, walleye, and sheepshead, and the rare species included alewife, white sucker, goldfish, carp, brown bullhead, stonecat, burbot, logperch, river darter, sauger, rock bass, white crappie (Sandusky Bay only), and northern muddler.

The majority of the mature smelt and yellow perch had spawned, but a few were still gravid or ripe. Walleyes had completed spawning. None of the other species, except a single northern muddler, appeared in a spawning condition.

Most of the smelt were in the 5- to 6-inch size range, and a sizable portion of the yellow perch ranged from 5.5 to 7.0 inches in length. Small catches of year-old smelt and yellow perch sug-

NOTE: PREVIOUSLY DESIGNATED CRUISE NUMBERS AND THEIR RESPECTIVE DATES WILL REMAIN UNCHANGED IN ORDER TO PREVENT POSSIBLE CONFUSION AND SCHEDULE CONFLICTS AMONG AGENCIES COOPERATING IN SEVERAL FUTURE PROJECTS FOR WHICH DATES HAVE BEEN SET.

gest the possibility of a poor hatch of these species in 1957, but it is too early in the season to be certain.

At the beginning of the cruise an appreciable smelt die-off (probably post-spawning mortality) was in progress. The dead and dying fish were badly fungused. By the end of the cruise, however, the mortality seemed to have run its course. The unaffected smelt showed a striking postspawning improvement in condition during the two-week period.

A few fish fry were taken in plankton nets towed at various depths alongside the boat or attached to the headrope of the trawls. The fry have not been positively identified as yet, but appeared to be smelt.

During the warm, still weather which prevailed toward the end of the cruise, the water in western Lake Erie became thermally stratified and surface water temperature rose rapidly. Surface temperatures rose from a low of 9.0° C. (48.2° F.) at the beginning of the cruise to a high of 20.0° C. (68.0° F.) at the end of the cruise.

The Cisco participated in a synoptic survey of western Lake Erie on May 13, 14, and 15. Two other vessels (the Service's M/V Musky and the and the SP-2 from the Ohio Division of Wildlife) cooperated in these surveys. Similar synoptic cruises will be repeated in midsummer and fall this year. Each vessel took surface water samples and temperatures at 2-mile intervals. Drift bottles were released at a number of points. Bathythermograph casts were made at 4-mile intervals aboard the Cisco. Analyses for total alkalinity and turbidity were made on most water samples taken by the Cisco.

Extensive meteorological observations were made. These included wind velocity and direction, wet and dry bulb temperatures, and barometric pressure. An anemometer was recently installed aboard the Cisco for accurate wind velocity readings. Weather data will be related to information collected at shore stations to determine how weather influences the lake, and the effect of the lake on weather conditions over land.

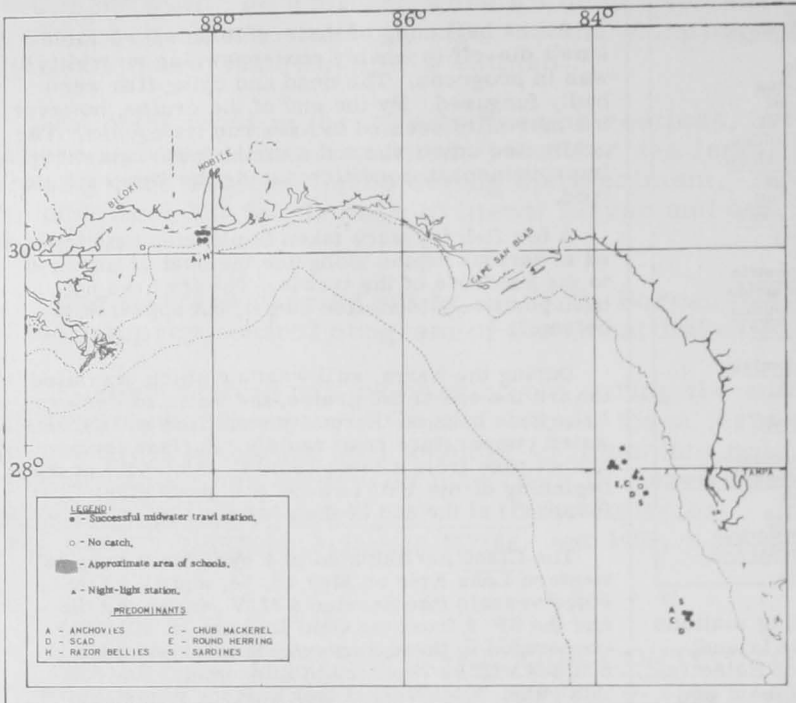
Preliminary analysis of the turbidity and total alkalinity values provides evidence that the main current of the Detroit River outflow passed between Middle Sister Island and West Sister Island on May 13 and 14. Water of considerably higher turbidity and alkalinity was encountered immediately south of West Sister Island. This is probably Maumee River water. Some shift in currents, which appears to be associated with a shift in wind direction from NE. to NW., was noted on May 15. Detroit River water extended 2 miles below West Sister Island and Maumee River water occurred in a narrow band along the south shore.



Gulf Exploratory Fishery Program

EXPLORATORY SURVEY OF SARDINE-LIKE FISHES IN GULF OF MEXICO
 (M/V Oregon Cruise 49): Along the west coast of Florida, from Cape San Blas to Ft. Myers Beach between the 10- and 30-fathom curves, extensive mid-water schools were located by a cruise (completed April 24, 1958) of the U. S. Bureau of Commer-

cial Fisheries vessel Oregon. Sampling of these schools with a 40-foot nylon mid-water trawl caught primarily small round herring (*Etrumeus teres*), and lesser amounts of anchovies (*Anchoa* sp.), chub mackerel (*Scomber grex*), and spanish sardines (*Sardinella anchovia*). The largest catch in this area was 100 pounds in a 30-minute tow. Echo-sounder recordings, however, showed very heavy concentrations of fish, indicating that the net was not positioned properly or that the fish were avoiding the net.



M/V OREGON CRUISE 49 (APRIL 3-24, 1958).

These concentrations were observed with echo-sounders over a two-week period. Two weeks prior to the dark of the moon, mid-water schools were observed during hours of darkness and daylight, but were not attracted to surface lights at night. During the dark of the moon, midwater schools were not detected during daylight hours

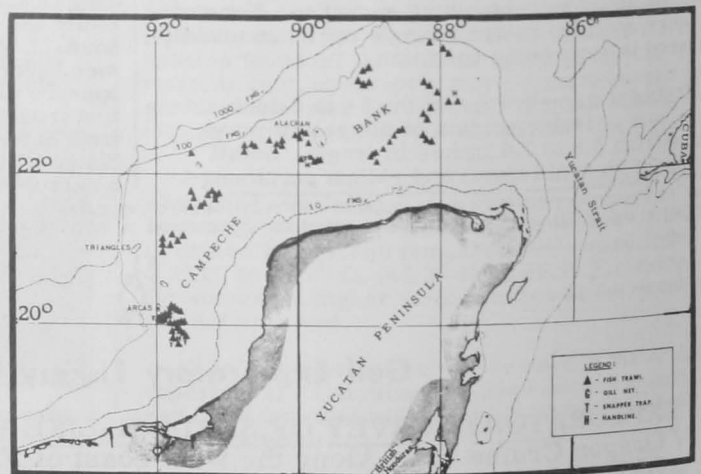
but became heavily concentrated at depths of 5 to 10 fathoms immediately after sunset and remained schooled at these depths until dawn. During the dark of the moon also, large quantities of these fish, attracted to a 1,000-watt light shortly after sunset, would remain all night and begin milling shortly before dawn. These were sampled with a lampara net and found to be composed of the same species as the mid-water trawl catches.

The last three days of the cruise were spent surveying between Pensacola and the Mississippi Delta, in depths of 5 to 20 fathoms. Small anchovies were found in 7½ fathoms off the north end of Chandeleur Island. Razorbellies (*Harengula pensacolae*) which were abundant in this area during February and March were not located on this cruise.

* * * * *

RED SNAPPER EXPLORATORY TRAWLING TRIP ON CAMPECHE BANK (M/V Silver Bay Cruise 8): To locate suitable trawling grounds and to attempt bottom trawling for red snapper on Campeche Bank, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Silver Bay* conducted a 23-day cruise which ended May 20, 1958.

Best fishing was south and southeast of Cay Arcas, in 20-35 fathoms. During 5 days of operation (33 drags), 4,600



M/V SILVER BAY CRUISE 8 (APRIL 28 TO MAY 20, 1958).

pounds of snapper and 700 pounds of grouper were caught with the trawl in this area. The best individual tow caught 870 pounds of snapper and 50 pounds of grouper. Trawling in the area east of the Tri-angles resulted in 2 snapper catches of 245 and 248 pounds. Catches to the north and east across the Bank produced catches varying from zero to 100 pounds. The average tow ran 1 to 2 hours, depending on bottom conditions.

A total of 90 exploratory drags was made. A small, heavy-duty, New England-style fish trawl was used on 81 drags. In spite of several hang-ups on rocks, there was no serious gear damage during the entire trip. The net had a 52-foot headrope and 72-foot footrope, and was made of $\frac{3}{16}$ " diameter braided nylon twine, $4\frac{1}{2}$ " stretched mesh in the body, and 5" stretched mesh in the cod end. The footrope was rigged its entire length with 20" diameter rollers and 38 trawl plane floats were spaced along the headrope. Eight-foot bracket doors were fished 10 fathoms ahead of the wings. Towing was carried on at half speed due to the small size of the net.

The performance of the otter-trawl gear was considered to be excellent, with only occasional slight tears in the netting. It was found that with the exception of scattered high "peaks" which can usually be avoided, the red snapper grounds of Campeche are, for the most part, trawlable with this type of gear.



FIG. 2 - A CATCH OF RED SNAPPER AND SOME GROUPER IN THE COD END OF THE TRAWLING NET, WHICH IS BEING HOISTED ABOARD THE EXPLORATORY FISHING VESSEL SILVER BAY. THE VESSEL WAS FISHING ON CAMPECHE BANK.

During the trip, 9 experimental snapper traps were set, but only 1 was successful. In this case, the trap took 13 red snapper (about 2 pounds each) after 2 days in the water. Another trap caught a 12-pound grouper after the same length of time.

One set was made with a sink gill net. The net was fished on the bottom for 24 hours and caught one 3-pound lane snapper, but had been badly fouled by a 12-foot tiger shark and a 150-pound sting ray.

The total snapper catch of 5,542 pounds was comprised of 10 species, with red snapper and lane snapper accounting for approxi-

Table 1 - Weight Tabulation of Snapper and Grouper Catch by M/V Silver Bay Cruise 8

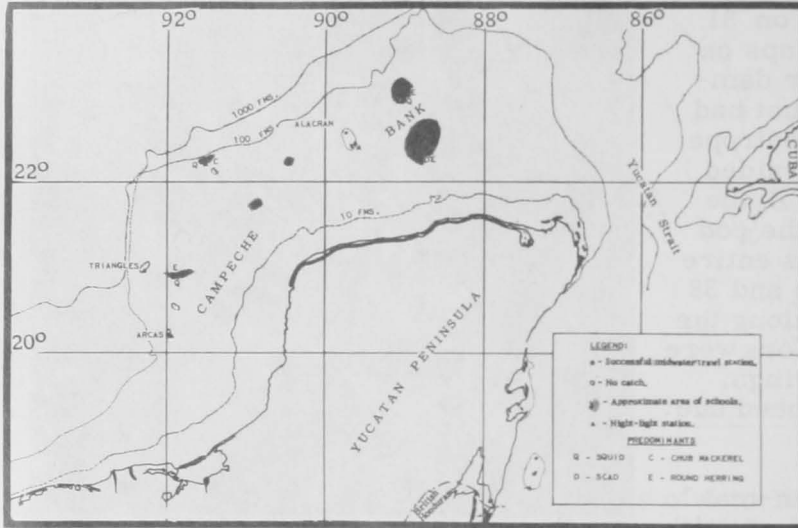
Latin Name	Species	Common Name	Weight		
			Total	Average	Range
			(Pounds)		
Snappers and Related Fish:					
<i>Lutianus aya</i>		Red snapper	1/3,298	5	1-27
<i>Lutianus synagris</i>		Lane snapper	1/1,043	2	1-4
<i>Lutianus analis</i>		Muttonfish	1/879	12	3-20
<i>Lutianus cyanopterus</i>		Cuban snapper	55	20	15-25
<i>Lutianus griseus</i>		Gray snapper	30	2	1-4
<i>Lutianus apodus</i>		Schoolmaster	58	8	6-30
<i>Lutianus buccanella</i>		Blackfin snapper	14	6	3-8
<i>Lutianus vivianus</i>		Silk snapper (yellow-eye)	7	7	7
<i>Ocyurus chrysurus</i>		Yellowtail snapper	1/98	1	1-4
<i>Rhomboplites</i> sp.		Vermillion snapper	60	1	1-2
<i>Lachnolaimus maximus</i>		Hogfish	41	9	3-12
Total snapper			5,542		
Groupers and Related Fish:					
<i>Epinephelus morio</i>		Red grouper	870	12	3-20
<i>Epinephelus nigretus</i>		Warsaw grouper	12	12	12
<i>Epinephelus guttatus</i>		Red hind	2	2	2
<i>Epinephelus striatus</i>		Nassau grouper	8	8	8
<i>Epinephelus microlepis</i>		Gag	60	8	2-16
<i>Mycteroperca phenex</i>		Scamp	143	4	3-6
<i>Mycteroperca falcata</i>		Scamp	8	4	4
<i>Mycteroperca bonaci</i>		Black grouper	274	15	10-30
<i>Promicrops itaira</i>		Spotted jewfish	515	257	150-365 (2)
Total grouper			1,892		

1/DOES NOT INCLUDE LARGE NUMBERS OF LESS THAN 1-LB. FISH.
 NOTES: FOR THE MOST PART, MINIMUM SIZES OF SNAPPER CAUGHT WITH THE 5" STRETCHED MESH COD END WERE $\frac{3}{4}$ TO 1 POUND. THE NUMEROUS SMALLER FISH WERE CAUGHT WHEN A 2" STRETCHED MESH LINER WAS USED FOR SAMPLING PURPOSES.

mately 80 percent of the catch. The grouper catch of 1,892 pounds contained 9 species. For the most part, minimum sizes of snapper caught with the 5" stretched mesh cod end were $\frac{3}{4}$ to 1 pound.

* * * * *

SURVEY OF MIDWATER SCHOOLING FISH CONTINUED IN GULF OF MEXICO (M/V Oregon Cruise 50): From May 12-23, 1958, the southern Gulf, from the northern shelves off the north coast of Yucatan to Arcas Reef on the Campeche Bank, was extensively investigated by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon, but only light signs of midwater schools were observed. Best



M/V OREGON CRUISE 50 (MAY 10-27, 1958).

indications were found about 40 miles NE. of Alacran Reef in 25-30 fathoms where widespread, but loosely aggregated schools, were observed at night. Sampling of these schools resulted in small (up to 150-pound) catches, consisting predominately of 6-8-inch round herring (Etrumeus) with a few scad (Decapterus). Further south only occasional light tracings were obtained and sampling efforts were generally unproductive. A few catches indicated that some of these tracings were squid. On one occasion a school of chub mackerel surrounded the vessel at the end

of a drag, but sounded and apparently scattered when the vessel resumed towing operations.

Relatively heavy bottom schools were noted on the recorder over most of the area indicated, but could not be sampled with the trawl. Attempts to attract schools to night lights were uniformly unsuccessful.

The period of May 24-27 was spent in surveying the area of the north Gulf between South Pass, Mississippi River Delta, and the north end of Chandeleur Island. Again, only occasional schools were recorded, although fairly heavy concentrations of razorbellies were observed one night in 8-10 fathoms of water. One drag, in 10 fathoms southeast of Chandeleur Island, caught 150 pounds of mixed chub mackerel, cigarfish, and small butterfish, but a large part of the catch was lost through tears in the trawl.

In both areas schools were seen on the recorders primarily at night.



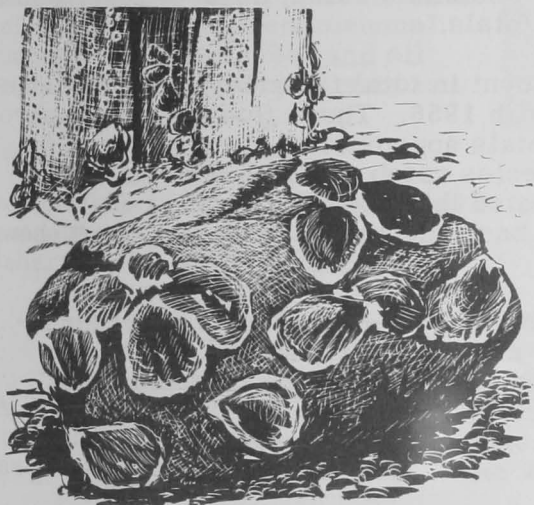
Maryland

CONTRIBUTION OF SHELL PLANTINGS TO OYSTER PRODUCTION: Shells planted by State and private agencies in Maryland waters provide suitable "cultch" (oyster shell thus far has proven to be the most practical cultch under Maryland conditions). Cultch is a biological necessity for the survival of baby oysters. Fertile oyster eggs de-

velop into tiny free-swimming larvae that travel with the tides for about two weeks. At the end of this period they must cement themselves ("set") on a firm object, usually an old shell or a living oyster, that will support them above the bottom. They are unable at this stage to survive in or upon the layer of silt that exists even in firm bottom. Upon

cementing themselves they make certain body changes (metamorphoses) through which they become the oyster with which we all are familiar. Without suitable cultch no young oysters can be produced.'

Bare shells obviously cannot receive a set of young oysters or "spat" unless oyster larvae occur in the water where they are planted. This means that there must be brood oysters to produce enough larvae for satisfactory setting. In some areas brood oysters have become extremely scarce. In other areas there are abundant brood oysters but the larvae become so scattered through strong tidal mixing that few are left over the bar where cultch is available. At times quantities of barnacles, Bryozoa, and many other forms of attached marine growth, as well as silt, may cover the shell surfaces before the oyster larvae are ready to attach. These and other factors greatly influence the quantity of oyster set upon the shells and at times may prevent any set at all.



OYSTER SPAT (MAGNIFIED MANY TIMES) ON SMALL PEBBLE.

Before man began to harvest them, all oysters completed their lives and died upon the bottom where they had set. Their shells thus continuously added to the cultch upon the oyster bed. Continued and intensive harvesting has interrupted this natural accumulation and, as older shells broke down or were silted over, many former oyster beds now have very little suitable cultch upon them. Where it is known that larvae will set in sufficient quantity, and it is decided to utilize the local set for a crop of adult oysters, then shells can be planted directly upon the beds and left there for maturity of the set that they receive. Where it is known that oyster setting is sparse, or almost absent, shells can first be planted elsewhere where the rate of setting is known to be unusually high. Areas of this nature are called "seed areas." After the spat have attached, the shells are taken up and planted as "seed" on beds where they are to grow to maturity. Production based upon seed oysters has the advantage of even-aged crops in the right concentration but involves more expense because of the transplanting from seed areas to growing areas.

Yields from private shell plantings can easily be measured by the books of the planters, but yields

from plantings on public bars are difficult to measure since the crops produced are usually combined with those from natural or unplanted areas. It is possible, however, to judge the expected yields by applying a knowledge of the normal natural setting rate where the shells are planted, the rate of growth, and the average normal mortality. We know that it takes 350 oysters of $3\frac{1}{2}$ -inch length to fill a bushel. In most places a $3\frac{1}{2}$ -inch size is reached at a little over three years of age or during the third autumn season. The normal death rate among young oysters seldom exceeds 10 percent per year after the first autumn (when the set is counted) under most Maryland conditions. Also clean shells planted at the beginning of the summer will usually catch about four times as many spat as will old cultch. Oyster research studies have produced a reasonably good picture of the average rate of setting on old or natural cultch in most Maryland waters during the past 15 years. By applying the above knowledge we can calculate how long it will take to produce a bushel of marketable oysters from a bushel of planted shell under various rates of setting on natural cultch. Thus it will require an average setting rate on old cultch of about 125 spat per bushel (equivalent to 500 spat per bushel on clean shells) to produce a bushel of $3\frac{1}{2}$ -inch oysters on planted shells by the third season, or about 45 per bushel to produce the same amount within 10 years, and at a natural setting rate of only 20 spat per bushel it would take about 24 years for a bushel of $3\frac{1}{2}$ -inch oysters to have been produced for one bushel of shell. The above figures apply only to early summer planted shells on hard bottom. Shells that settle in the bottom or become badly fouled before any oysters set will produce much less.

Since the average amount of oyster set varies greatly throughout the State, and from year to year, the relative success of shell plantings can be expected to show great differences. Large areas along the western side of the Chesapeake Bay and in the upper portion of certain major rivers have been found to average less than 20 spat per bushel and shell plantings can seldom pay in such locations. Other large areas with slightly higher sets require fairly long periods for the shells to pay for themselves, while in a few areas, mostly certain tributary waters, sets of 125 or more are normal and here shell plantings sometimes produce excellent yields. There have been numerous instances of individual failures and marked successes. Where to locate specific shell plantings, and whether or not to use shells for seed production or direct yields, are decisions that involve many practical and political considerations. For over a century the original oyster beds of Maryland were stripped of oysters and shell before any attempts at rehabilitation were made and the decline in production was rapid. The combined efforts of State and private planting at present cover only a small percentage of the acreage of chartered and potential oyster bottom. Without the shell plantings of the past quarter century, however, Maryland oyster production would have fallen much below its present level. Continued efforts in the increased and most effective use of oyster shell and of substitute cultch, both by the State and private planters, constitutes an essential step in the building up of Maryland oyster production. (March-April 1958 *Maryland Tidewater News* of the Maryland Department of Research and Education.)

MARKETING CHANGES AFFECT FISHERIES CATCH IN 1957: Two changes in marketing have affected Maryland's ocean fisheries, according to Maryland's Chesapeake Biological Laboratory. This observation was made after analyses of the records returned by licensed commercial fishermen and cooperating dealers and a field survey of the Ocean City fisheries.

One change involved industrial fish production. Traditionally, the ocean fishermen return "trash" or industrial fish to the water, as they have been considered worthless. During 1957, however, a processor at Bishopville, Md., started utilizing for byproducts industrial fish and scrap from fishery plants. Several fish trawlers from Ocean City supplied industrial fish to this processor. The 1957 catch of industrial fish from these trawlers amounted to over 5 times that of 1956, while the 1957 value was over 12 times that of 1956.

The second change, that of a lower demand, caused declines in surf clam fishing, due to internal changes of the industry, rather than to any depletion of surf clam beds. The records indicate that the surf clam beds can support the same amount of fishing as practiced since 1953, because catches were maintained at high levels by the active dredgers. The 1957 total catch and wholesale value, nevertheless, amounted to approximately three-fourths of the 1956 totals.

Records also indicate a decrease of 7 percent in total fisheries production during 1957 and 9 percent in value as compared with 1956. These fluctuations appear to be normal for the ocean fisheries and the totals approximate the average of the last 13 years (base years 1944-1956). The species catch in pounds and value of croaker, gray sea trout, and surf clams reflected this apparent general decline, while 1957 totals for bluefish, fluke, spot, sea bass, industrial fish, and conch showed apparent rises.

Officials of the Chesapeake Biological Laboratory feel that the market for industrial fish can probably be expanded greatly at Ocean City, Md. A plant near Ocean City should result in higher prices to the fisherman since transportation costs of raw fish would be effectively reduced.



North Atlantic Fisheries Exploration and Gear Research

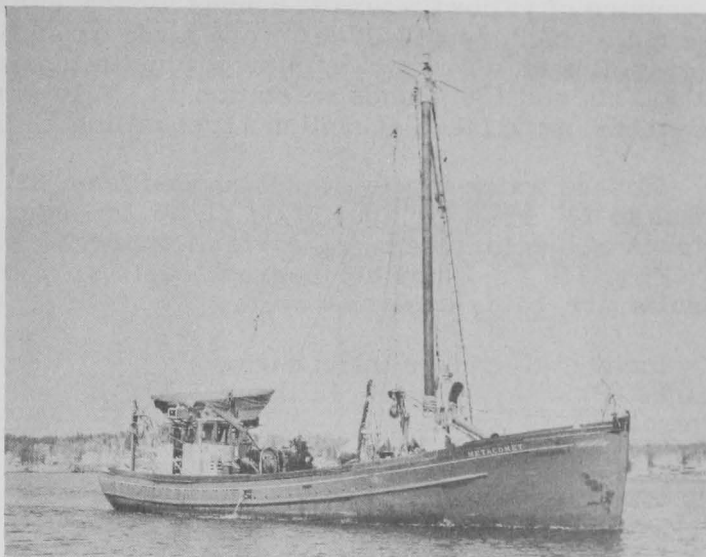
HARD-SHELL AND SURF CLAM EXPLORATION STARTED BY M/V "SUNAPEE": The vessel Sunapee has been chartered by the U. S. Bureau of Commercial Fisheries to conduct a survey of hard-shell and surf clam resources in Nantucket Sound and adjacent areas. Operations were scheduled to begin on June 2, 1958, and continue through the months of July and August, using a conventional commercial-type jet dredge. The purpose of the survey during the three-month period will be to undertake the location of new grounds and to determine the commercial potentiality and abundance of hard-shell and surf clams that may be available in those areas. This exploratory survey program was recommended by the Atlantic States Marine Fisheries Commission.

The majority of exploration time will be spent in Nantucket Sound, and the surf-clam phase of the survey will be conducted in the offshore area surrounding the Sound, using the same jet-dredging methods.

Oceanographic and biological information, as it pertains to the survey, will be collected. Progress cruise reports, reviewing general exploratory findings, will be issued monthly.

LAUNCE OR SAND EEL EXPLORATIONS OFF NEW ENGLAND COAST INITIATED: In order to initiate exploration for commercial concentrations of launce or sand eels (*Ammodytes* sp.) off the New England coast, the Bureau of Commercial Fisheries chartered trawler Metacomet departed from East Boston during the week of May 19, 1958. The Metacomet was to utilize a fine mesh otter trawl of a design now used in the Holland and Denmark sand-eel commercial fisheries.

A commercial reduction fishery now exists off the coasts of Holland and Denmark for sand eels, and in 1957 over 75 million pounds were caught by small and medium draggers from April through July. This fishery has developed since 1953, when the Danes first started to fish the sand-eel resource with phenomenal success. The fish meal and oil product of this fishery is said to be of unusually fine quality.

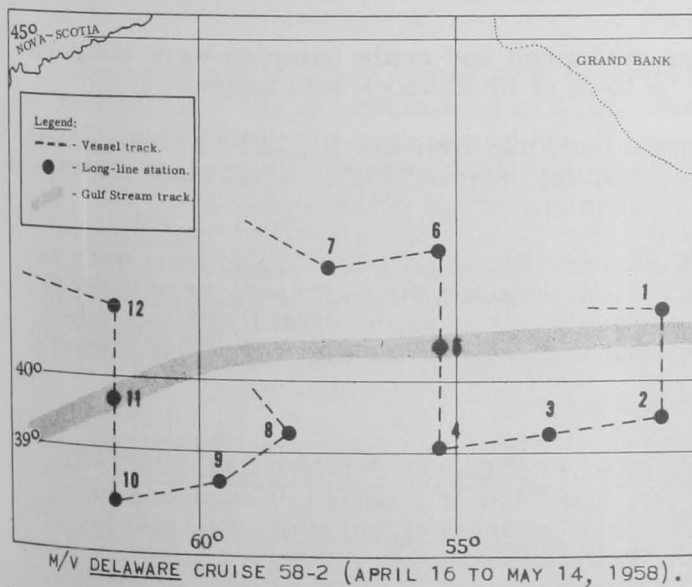


SERVICE'S RESEARCH VESSEL METACOMET.

Since sand eels are known to exist off the coast of New England in substantial quantities, the exploratory and gear tests should give further information on the commercial possibilities of this type of fishery in the New England area.

* * * * *

TUNA FISHING EXPLORATIONS IN WESTERN NORTH ATLANTIC CONTINUED (M/V Delaware Cruise 58-2): This cruise is the first tuna long-line exploratory cruise of the 1958 season and continues the program initiated in 1957 to investigate the pelagic offshore resources of the western North Atlantic.



Over 11 tons of bluefin tuna (*Thunnus thynnus*) were landed at 2 exploratory long-line stations during this Delaware cruise. Twelve exploratory stations were fished in a 76,000-square-mile area of the North Atlantic, extending from south of the Grand Banks to the Gulf Stream track and westward to an area southeast of Georges Bank. This marks the first time this area has been investigated for subsurface pelagic resources and during this exploratory cruise approximately 15 tons of tuna were taken.

Tuna long-line gear, of nylon construction, similar to that being used commercially in the Gulf of Mexico, was used on all stations. The normal exploratory set during this cruise was 60 baskets (1 basket--826' long, 10 hooks per basket). On all sets frozen sea herring

(Clupea harengus) was used as tuna bait. No gear was reported lost during the cruise.

Bluefin was the primary tuna species taken during the cruise, with an occasional capture of yellowfin tuna (Thunnus albacares) and skipjack (Euthynnus pelamis). The major captures of bluefin were made on stations 11 and 14 utilizing 60 baskets of gear at each station. The size of bluefin tuna averaged about 175 pounds each on station 11, and 130 pounds on station 14. A total of 79 bluefin--the largest number captured--were taken at station 11, equalling 13 fish for each 100 hooks.

Surface water temperatures ranged from 62° F. in the area south of the Grand Banks to 73° F. in the area of 38° 26' N. latitude, 59° 40' W. longitude with principal catches of bluefin tuna being made in the areas where the surface water ranged from 66° F. to 73° F. Bathythermograph casts were made at all fishing stations and the results are being analyzed by the Woods Hole Oceanographic Institution.

Incidental species taken during the long-line operations consisted of 13 blue sharks (Prionace glauca), 11 lancetfish (Alepisaurus ferox), 1 white-tipped shark (Pterolamiops longimanus), and 1 silk shark (Eulamia floridan). No white or blue marlin were taken during the cruise.



North Atlantic Fisheries Investigations

HADDOCK SAMPLES COLLECTED FOR ECOLOGICAL STUDIES (M/V Silver Mink): During a one-day cruise (May 12, 1958), the U. S. Bureau of Commercial Fisheries chartered vessel Silver Mink made observations and collected data for the haddock ecology study. The area covered by the cruise included the Highland Grounds north-northeast of Cape Cod Light, in 58-64 fathoms. The area fished was 2½ miles wide (east to west) and 4½ miles long (north to south). Three tows were made with an otter trawl having a 1½-inch mesh cod end liner. Two bathythermograph lowerings were made. All species were identified and enumerated in one sample tow and the important species were measured. A sample of dabs was collected for age and growth studies.

The total of 315 haddock taken was measured and scale samples were obtained from 84 male and 59 female haddock. A total of 53 haddock was tagged.

In a sample of 52 male and 48 female haddock, fish weight, liver weight, gonad weight and state of development, and drumming muscle length, weight and color were recorded. Scales, fin rays, and stomach contents were collected.

Red hake were most abundant in the catch; whiting, haddock, and dabs were next in order of abundance. Compared to previous cruises the average size of haddock was larger and there was a marked increase in the number of whiting captured. A few haddock were in spawning condition but the greater majority were spawned out.

* * * * *

LIFE HISTORY STUDIES OF VARIOUS SPECIES OF INDUSTRIAL FISH AND SCALLOPS INITIATED (M/V Jacquelyn): The first of a series of regular monthly trips using the U. S. Bureau of Commercial Fisheries chartered vessel Jacquelyn began on May 21, 1958. These one- and two-day trips were designed to obtain periodic data for life history studies of various species of industrial fish and scallops.

Although fog hampered operations for most of the trip, a considerable amount of sampling was done and a bed of scallops was located for year-round study.

Samples of scallops, red hake, scup, fluke, and yellowtail were brought back to the Woods Hole laboratory for detailed study.

UNDERWATER TELEVISION RESEARCH OFF CAPE COD (M/V Albatross III Cruise 109): Underwater television research on the Cape Cod fishing grounds was conducted by the U. S. Bureau of Commercial Fisheries research vessel Albatross III on a three-day cruise that ended April 24.

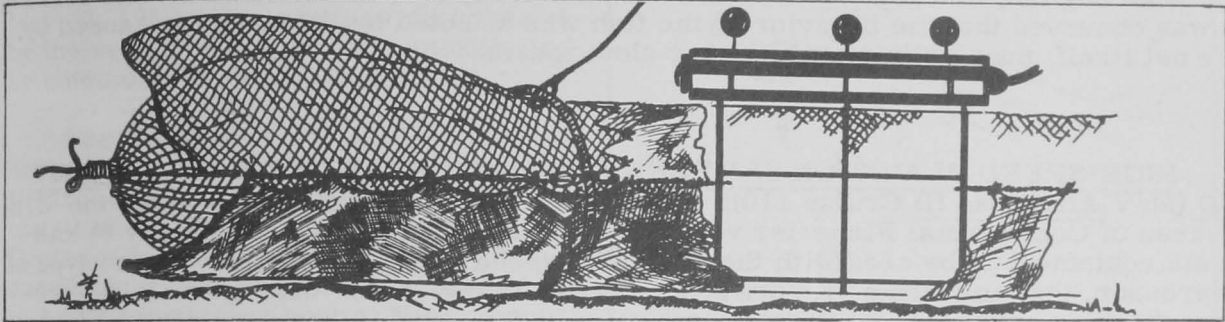


FIG. 1A - TELEVISION CAMERA RIGGED TO STUDY THE EFFECT OF CHAFING GEAR ON ESCAPEMENT FROM THE COD END.

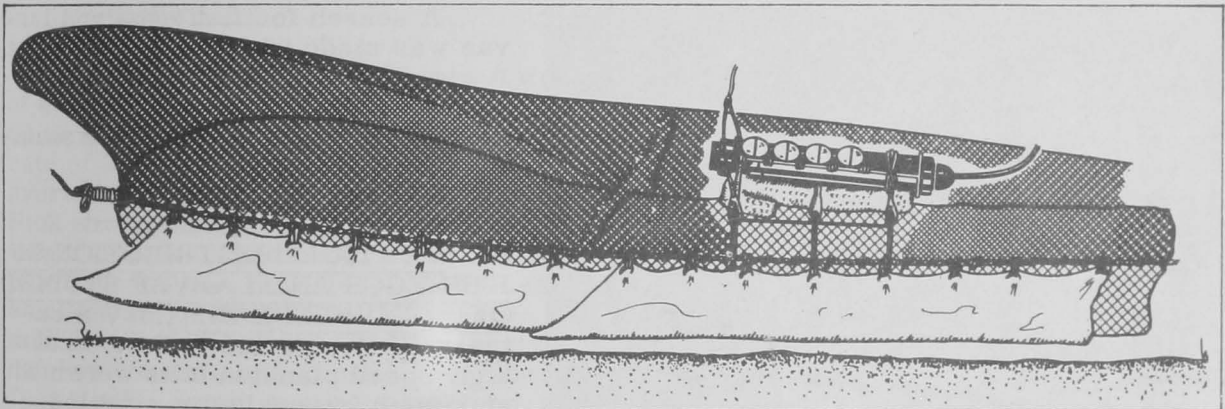


FIG. 1B - TELEVISION CAMERA RIGGED ON TOP OF COD END TO OBSERVE FISH BEHAVIOR INSIDE THE COVER.

The research was concerned with the possible future use of television as a tool for estimating sizes of populations of fish. The area off Cape Cod was selected for

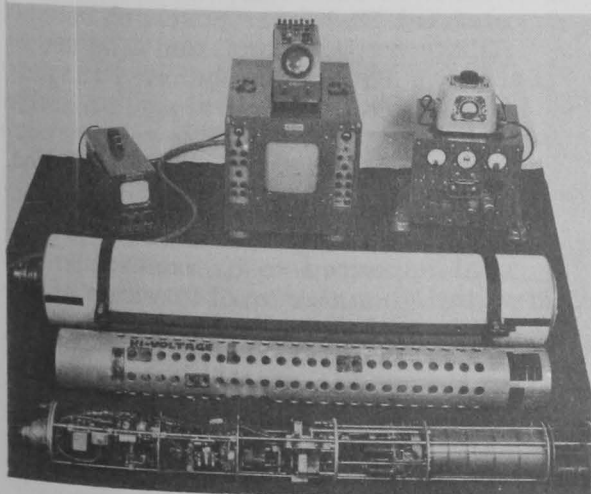


FIG. 2 - UNDERWATER TELEVISION EQUIPMENT. TOP: LEFT & CENTER--5" & 17" MONITORS; RIGHT--POWER SUPPLY UNITS. CENTER: CAMERA HOUSING UNITS. BOTTOM: CAMERA COMPONENTS.

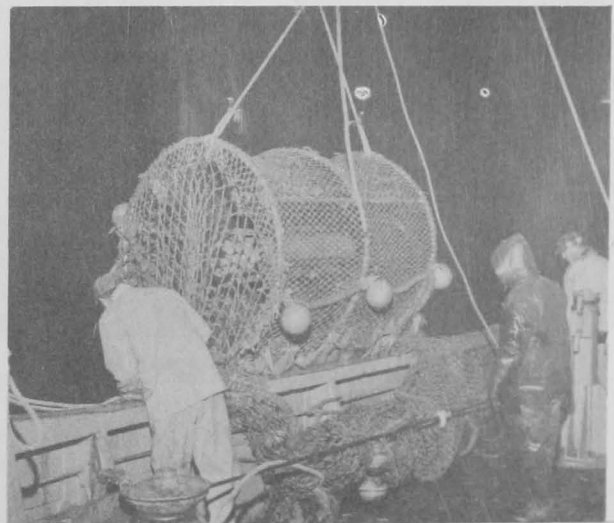


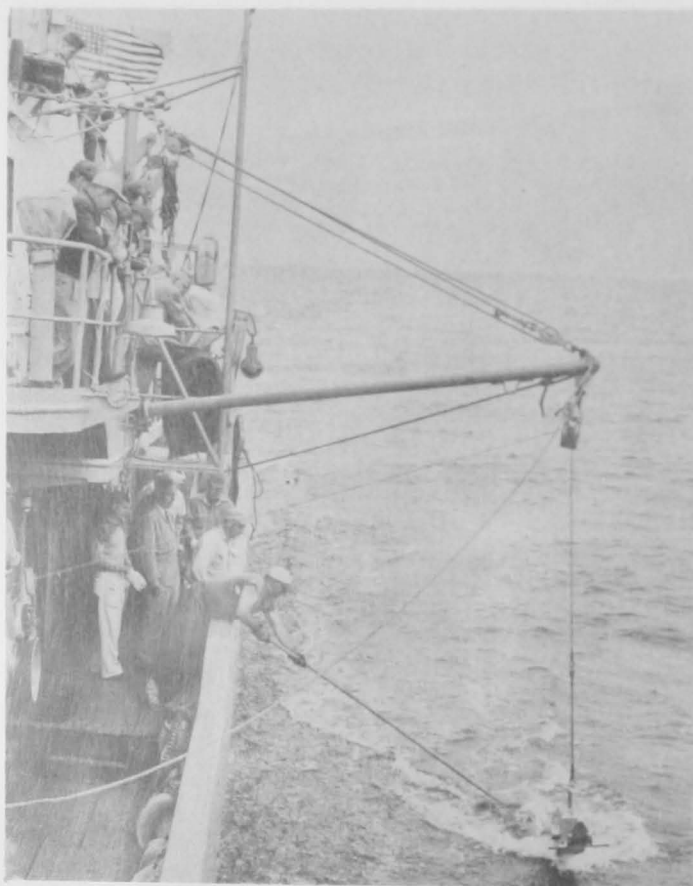
FIG. 3 - LOWERING UNDERWATER TELEVISION CAMERA DURING NIGHT OPERATIONS.

the clearness of the water at this time of the year. Unfortunately, the weather was bad and artificial lights were necessary to see the fish with the television camera.

The television camera was fastened in the cod end of the net so that the behavior of the captured fish could be observed. In two of the experiments, holes (9 and 22 inches) were left in the ends of the nets so that the fish could escape. Surprisingly, none of the fish caught made any serious attempt to leave through these back doors. In all likelihood, this was due to the effect of the artificial light used. The fish caught included dogfish, blackback and yellowtail flounders, cod, small haddock, and herring. It was observed that the behavior of the fish was affected by the turbidity caused by the net itself, especially when towed at slow speeds.

* * * * *

HIGH-SPEED PLANKTON SAMPLER AND MULTIPLANE KITE OTTER TESTED (M/V Albatross III Cruise 110): This cruise (completed May 8, 1958) of the U. S. Bureau of Commercial Fisheries vessel Albatross III was made principally to calibrate equipment to be used with the Miller hi-speed plankton sampler. A new type of depressor, the multiplane kite otter, was used. Using $\frac{1}{4}$ -inch wire and this depressor, the wire curve was computed for speeds of 5, 7, and 10 knots, at depths of 50, 75, and 150 meters. The Miller sampler was tested at the same time.



HAULING IN THE HARDY PLANKTON RECORDER.

A search for fish eggs and larvae was made with a one-meter net. A concentration of eggs and/or larvae of haddock, cod, cusk, plaice, and rockling was found on the southeast part of Georges Bank.

* * * * *

VERTICAL DISTRIBUTION OF FISH EGGS AND LARVAE STUDIED OFF GEORGES BANK (M/V Albatross III Cruise 111): Horizontal high-speed plankton tows were made at 2-hour intervals for a period of 48 hours in the South Channel and in the southeast part and southwest part of Georges Bank during this cruise of the U. S. Bureau of Commercial Fisheries research vessel Albatross III (completed May 28, 1958). The depths sampled ranged from zero to 75 meters. In addition 96 bathythermograph lowerings were made and 450 drift bottles released.

Larval haddock, cod, and flounder were fairly abundant and in general appeared to be concentrated at the 10-meter level in water deeper than 60 fathoms and at the 20-30 meter level in water of less than 60 fathoms.

North Pacific Exploratory Fishery Program

COMMERCIAL SHRIMP CATCHES OFF COAST OF WASHINGTON (M/V John N. Cobb Cruise 37): Additional shrimp fishery grounds with good commercial fishing possibilities were found off the coast of the State of Washington by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb during a four-week cruise that ended on May 23, 1958. The grounds discovered by the vessel were in areas unexploited by commercial shrimp fishermen.

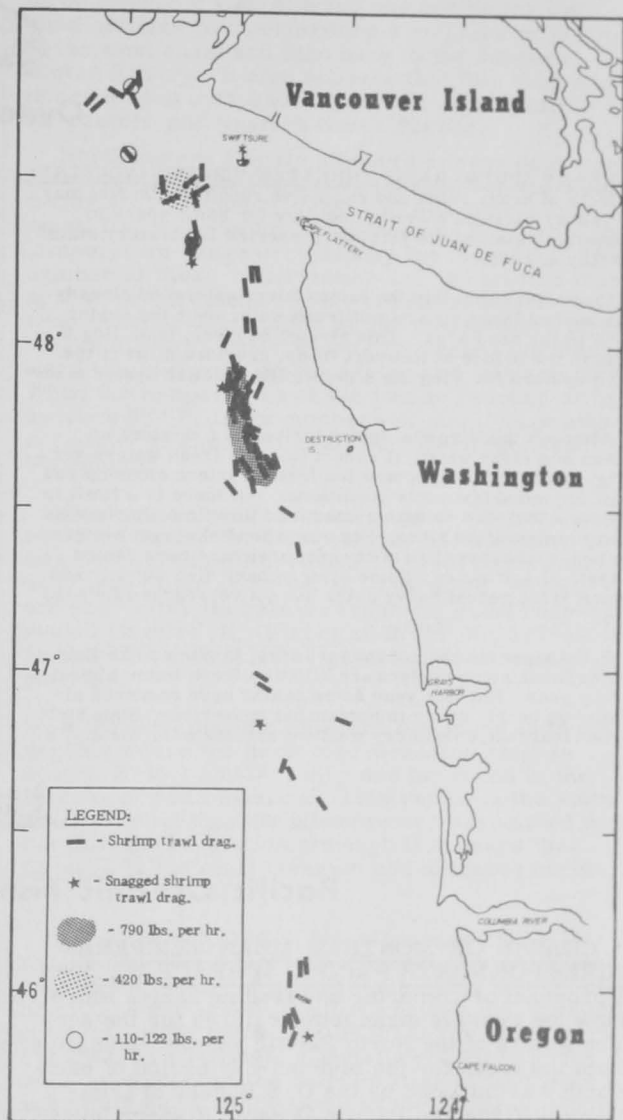
Best catches of "cocktail" size pink shrimp were made in the area between Destruction Island and Quillayute (see chart) at depths from 60-68 fathoms. Depths between 64 and 67 fathoms produced consistent catches at a rate of 400 to 1,500 pounds per hour. The discovery of this ground extends the present area of commercial fishing about 18 miles further to the north.

Six drags made about 20 miles west of Cape Flattery, Wash., at depths from 68 to 107 fathoms caught shrimp at a rate of 290 to 630 pounds per hour, and averaged close to 300 pounds per hour. Pink shrimp caught in this area were larger and averaged about 85 to the pound (heads on), however, a considerable amount of incidental fish were mixed with the shrimp. Incidental fish catches consisted of Pacific ocean perch, Dover sole, smelt, turbot, black cod, and other flatfish.

A number of drags were made in deep water at depths from 100-200 fathoms in an attempt to locate the larger side-stripe shrimp. No commercial quantities of the species were located, although one 30-minute drag made northwest of Swiftsure Lightship yielded a catch of 30 pounds. These shrimp averaged about 35 to the pound (heads on).

A total of 66 drags was made during the cruise at depths ranging from 49 to 203 fathoms. The area of operations included the offshore waters between Cape Falcon, Ore., to the Swiftsure Lightship, northwest of Cape Flattery. All drags, each of 30 minutes duration, were made with a 43-foot Gulf-of-Mexico flat-type shrimp trawl.

This cruise by the Bureau's exploratory fishing vessel was the second in a series of shrimp surveys being conducted in the North Pacific during 1958. The first exploration revealed good commercial beds of "cocktail" size pink shrimp off the northwest Oregon coast. Further explorations this year will be undertaken along the central and southern coasts of Oregon and in the Kodiak-Cook Inlet area of Alaska. These surveys are being made in cooperation with the fisheries agencies of Washington, Oregon, and Alaska.



M/V JOHN N. COBB CRUISE 37 (APRIL-MAY 1958).

Throughout the cruise records were maintained on bottom water temperatures, bottom type, organisms encountered, etc., which may be helpful in defining the typical environmental conditions prevailing in areas where concentrations of shrimp are located. Samples of shrimp were also taken for laboratory study.



Oysters

HEAVY SPRING RAINS THREATEN VIRGINIA INDUSTRY: Effects of heavy rains and excessive runoff this spring may be felt by Virginia's oyster industry for some years to come, biologists at the Virginia Fisheries Laboratory stated on May 8, 1958.

Excessive rainfall in the James River watershed already has pushed large amounts of fresh water over the oyster bars in the seed area. This stretch of river, from Hog Island to the bridge at Newport News, provides most of the seed oysters for Virginia's multimillion dollar oyster industry.

Although the Virginia oyster thrives in a mixture of ocean and river water, it cannot tolerate fresh waters very long. When waters become too fresh, oysters close up and wait for more favorable conditions. But there is a limit to the time they can remain closed, and this time shortens as water temperature rises. For over two weeks many oysters on beds in the upper half of the seed area have been denied a taste of salt water. Some oysters have died already and runoff from recent heavy rains has not yet reached the seed area.

In the upper reaches of the seed area, in places like Deep-water Shoal, some oysters are killed by fresh water almost every year. But this year some deaths have occurred already on nearly every important bar in the river. State biologists fear that, unless dry weather arrives immediately, a

catastrophe may occur. Even if the situation becomes no worse than it is at present, they expect a shortage of seed oysters next fall.

Another important oyster area that can be affected is the Rappahannock River. Conditions there are not yet as serious as in the James, and if a dry spell develops, the industry may escape damage. Laboratory biologists are keeping a close watch on conditions in the Rappahannock.

Oystermen in Maryland also are concerned about possible effects of fresh water. The Susquehanna River is dumping unusually large amounts of fresh water into the upper bay. Recent surveys have shown that some of the tributary rivers are saltier than the Bay, a very unusual situation. If this condition persists for any considerable time, the rivers could quickly become fresh for their entire lengths.

Like many clouds, this one has a silver lining. Fresh water also kills barnacles, mussels, and other organisms that foul oyster shells and interfere with setting and growth. No less important is the effect on oyster drills or screwborers, a serious oyster enemy that cannot tolerate fresh water as well as the oyster can. Removal of fouling, pests, and enemies can improve conditions for oyster setting and growth. Freshets, though they may cause serious temporary damage, often are followed by unusually good sets and by greatly improved oyster harvests for a few years. This has been the experience in the Rappahannock River during the past oyster season, following the disastrous mortalities of 1955.



Pacific Oceanic Fishery Investigations

CHARTS OF MONTHLY MEAN TEMPERATURES FOR NORTH PACIFIC SURFACE WATERS: A program of preparing and issuing charts which show the monthly mean temperatures for the surface waters of the North Pacific and the anomalies from the mean for the mid-ten-day period of each month was initiated by the U. S. Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations (POFI) in Honolulu. The anomaly charts revealed that the surface temperatures during 1957 were consistently warmer than normal over vast areas of the eastern North Pacific, a report on POFI activities for the first quarter of 1958 reveals.

Beginning with January 1958, sea surface temperature charts of the northeastern Pacific were issued for the mid-ten days of each month for both 1957 and 1958. In addition, anomaly charts for the particular month for both years from the 30-year mean and of 1958 from 1957 were prepared. These charts showed that during the 1957 January-March period, the coastal waters between 35° N. and 45° N. were colder than normal and the offshore waters were generally warmer (to 6° F.) than normal. During the first quarter in 1958, somewhat the opposite situation existed--the entire coastal area was warmer than normal while the offshore areas showed a progressively increasing amount of colder than normal areas.

EQUATORIAL TUNA STUDIES: The survey phase and the processing and analysis of the data for POFI's two-year study of the abundance and distribution, and variations therein, of the tuna resources of French Oceania continued during the first quarter of 1958.

A definite seasonality of occurrence of surface tuna schools about the Marquesas Islands was confirmed by the results from two cruises made to the area during the quarter. Surprisingly consistent results were obtained from the standardized inshore surveys.

Seasonality of Occurrence of Surface Tuna Schools about Marquesas Islands	
Date	Number of Tuna Schools Sighted
September 1956	40
January 1957	87
February 1957	79
October 1957	34
November 1957	41
January 1958	76
March 1958	90

In order to determine the role of the Marquesas group as a concentrating mechanism for surface tuna schools, a broad survey coverage offshore from the Marquesas, scheduled for repetition dur-

ing each subsequent cruise, was begun in November 1957. Results from two such surveys and part of a third, which was under way in the first quarter of 1958, indicate that surface tuna schools are about three times more available in offshore waters during the Marquesan summer.

To date, stomachs from 243 skipjack caught in Marquesan waters have been examined. This study of the food habits of the Marquesan skipjack showed a preponderance of fish in their diet. Fish comprised 65 percent of the food items, crustaceans 30 percent, and the molluscs 5 percent. Of the food fishes, 22 families have been identified, and of the latter, 16 are primarily families of reef-inhabiting forms. Of the crustaceans, the stomatopods were the most numerous. Thus the production of reef fauna appears to play an important role in the diet of the Marquesan skipjack.

HAWAIIAN SKIPJACK STUDIES: Skipjack tagged in Hawaiian waters during the summer and fall of 1957 continued to be recaptured and returned to the POFI laboratory at Honolulu, although the rate of recovery was considerably below that reported for the previous quarter (213 recoveries). A total of 46 tagged fish was recovered bringing the over-all recovery rate to 9.1 percent. Recoveries were made in the areas in which the fish had been released as well as in other areas of the fishery, with certain exceptions. The recoveries do indicate, however, that a large portion of the fish tagged last season are resident in Hawaiian waters and that a group of fish tagged at any one location may disperse throughout the body of fish contributing to the Hawaiian fishery. An important exception to these statements are fish tagged near Kauai. Very few of these fish have been recovered, and only one to the east of the tagging area.

Catches of skipjack during January by the Hawaiian fleet were high, in fact landings during the month were higher than for any previous January. During February and March, landings dropped to more normal low levels.

The collection of temperature records and salinity samples from shore based-monitoring stations continued. As compared with the same period in 1957, temperatures at Koko Head, Oahu, were about the same. Salinities, on the other hand, were noticeably higher than in 1957, reaching the highest level since observations were started in November 1955. This is a continuation of the high level which started during the last quarter of 1957.

ALBACORE TUNA PROGRAM: Work under the albacore tuna project during the first quarter of 1958 was confined to laboratory analysis of the data presently at hand. Biological work included the beginning of the analysis of data pertaining to the general population of fish north and northeast of the Hawaiian Island chain, and the herbivore-predator relation in the plankton for the central North Pacific. Oceanographic work consisted of a continuation of the analysis of the chemical and physical data from the central North Pacific and the preparation of the current series and historical series (1957) of sea surface temperature charts from ship's weather reports for the middle 10 days of each month.

Data on the ecology of the albacore tuna to date reveal the general distribution of the albacore and its movements as shown by tagging, temperature, and productivity. The hypothesis relative to the migration suggested by the data is that there are three groups of fish with the one containing the smallest size fish performing a complex migration to the west coast and then back to the Japanese winter fishery. It also appears that this migration is acted upon independently by the environments of the eastern and western North Pacific.

Northeastern Pacific albacore survey data were examined in regard to the distribution of the three major size-frequency curves of albacore. The small fish were taken in the warmer portion of the temperature range occupied by the albacore. The number of these "noncommercial" small fish that appear in the catches of the northern United States west coast is determined by the temperature of the tongue of warm water which progresses northeastward into the area during spring and late summer. When the temperature of the tongue reaches or exceeds 62° F. large numbers of small-size albacore may be expected to appear off Oregon and Washington.

The recovery of only one tagged albacore was reported during the first quarter of this year. It was recovered on November 17, 1957, by a Japanese long-liner at 38°08' N., 174°53' E. exactly one year after its release from the POFI research vessel Charles H. Gilbert at 36°44' N., 127°37' W. During this period it had gained approximately 15 pounds.

It appears that the albacore are found in those regions where the herbivore-predator ratio is around 20 to 1 and that they are not found in the regions of ratio maxima. This replaces the more narrow belief that the albacore are associated with the *Calanus* population although it appears that *Calanus* is the most common and abundant herbivore.

TILAPIA STUDIES: The efficiency of the Hawaiian skipjack fishery is affected, in part, by an inadequate supply of natural bait. The species of natural bait presently available have a low survival potential in the baitwells. POFI is presently working towards a possible alleviation of these problems by studies of the potentialities of tilapia as a substitute bait. In the tanks at the Honolulu laboratory, young tilapia are being produced primarily for the purpose of physiological and ecological studies. The production in these tanks dropped considerably during the first quarter of 1958 (winter months) with monthly totals of 35, 3,181, and 7,952 fish. We continue to be plagued with mortality from a sporozoan parasite. Potassium permanganate, copper sulphate, and pyridylmercuric acetate were used as germicides on the living fish, with the latter being considered as most effective. Formalin sterilization of the tanks proved to be an effective measure.

Another and more ambitious study of tilapia, particularly the economics of commercial production of bait-size tilapia and the use on commercial vessels, is a cooperative program managed and operated by POFI on the island of Maui. During

the quarter, tanks were stocked and a full-time fishery biologist stationed at the site. In January, an estimated 5,000 tilapia were transported to Maui and from these 500 adult males and 1,500 adult females were segregated as a brood stock. Eighteen young appeared on February 20, and during successive weeks 768, 8,288, 5,060, 3,188, and 2,855 were produced.

There was evident mortality among the young resulting from predation by dragonfly larvae. This, and other problems (such as increasing the early morning supply of dissolved oxygen in the

tanks and devising increasingly efficient methods for removing the young fish from the brood tanks) are receiving attention.

To further augment POFI's studies concerning an economical and efficient substitute for natural bait, a contract with the Territorial Fish and Game is presently being negotiated for a program of rearing tilapia in natural ponds. Also, a biologist is being added to the staff for the period of the Hawaiian summer skipjack fishery. He will observe the reactions of the tilapia under conditions of commercial fishing aboard the local sampans.

* * * * *

PRODUCTION OF TILAPIA FOR TUNA BAIT CONTINUES SATISFACTORILY:

The production of tilapia for use as bait fish in live-bait fishing for skipjack continued satisfactorily during the month, according to May 1958 news notes issued by the Pacific Oceanic Fishery Investigations of the U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii. The cooperative tilapia rearing plant on the island of Maui experienced some mortality through disease, but some 30,150 fry were produced during the month and by the end of May a total of 62,000 fry in 14 tanks was on hand. At the laboratory site the production of young fry improved with a recruitment of 21,350 during the month, making a total production of 214,000 tilapia fry since the project was initiated. Total fry on hand at the end of the month was 35,300.

HAWAIIAN SKIPJACK TAGGING PROGRAM: The Hawaiian skipjack tagging program for this year got under way in May with the charter of two sampans by the Pacific Oceanic Fishery Investigations in Honolulu. The Buccaneer experienced a main engine breakdown and it was not until May 26 that she was able to operate. Nevertheless in the next few days her crew tagged about 2,000 small skipjack near the island of Kauai. The other sampan, the Corsair, completed her charter on May 16 with a total of 2,001 skipjack tagged off Hilo, Hawaii. Of this total only 230 fish were considered season fish (20-22 pounds) while most of the balance were in the 4-pound class. At the end of the month 234 of the tagged fish had been recovered. Two of last year's tagged fish were also recovered near Hilo. These fish, when tagged in September 1957, weighed 4 pounds but scaled 11 pounds when recovered.

* * * * *

SURVEY OF MARQUESAS ISLANDS FOR TUNA RESOURCES CONTINUED (M/V Hugh M. Smith Cruise 43): The U. S. Bureau of Commercial Fisheries research vessel Hugh M. Smith completed another in a series of cruises to the Marquesas Islands for a survey of surface schools of tuna. The vessel departed from Honolulu on January 3, 1958, and returned on February 25, 1958. In addition to the search for surface schools of tuna, 12 monitoring stations were occupied off the Island of Oahu and other physical and biological data were collected.

Inshore Survey: A total of 29 schools of skipjack were sighted, 11 were chummed, and 4 were fished. The catch was 416 3- to 6-pound skipjack of which 274 were tagged. Four schools of mixed skipjack and yellowfin were sighted and chummed, but the catch from the single mixed school fished was only 9 5.5- to 7.5-pound skipjack and a single 9-pound yellowfin. Two schools of 30- to 50- pound yellowfin were seen and chummed unsuccessfully. Of 41 unidentified schools seen, one was chummed with its identity unestablished. In general, the schools were wild, easily dispersed, and most numerous near islands.

Offshore Survey: A total of 34 schools of skipjack were sighted, 21 chummed, and 8 fished. The catch consisted of 344 4- to 7-pound skipjack and 300 16- to 29-pound skipjack. Of the 644 fish caught, 336 were tagged. Two mixed schools of

skipjack and yellowfin were seen of which one was chummed and fished, producing a catch of 92 fish (35 fish tagged). Of 38 unidentified schools seen, 8 were chummed with no catch being made.

Of the 74 schools seen on the offshore survey, 25 were sighted on the north leg, 22 on the east, 14 on the south, and 13 on the west. Dividing each leg into inner, middle, and outer portions (75 miles each) gives a school distribution of 27 (inner), 17 (middle), and 30 (outer) sightings for the entire survey. Skipjack of 16-29 pounds were frequently seen on the outer portions of each leg, whereas in the inner portions the fish were mostly of 4-6 pounds.

In addition to the schools listed above, the following were sighted on the runs to and from the survey center to baiting sites: 5 skipjack, 1 yellowfin, and 18 unidentified. One school of skipjack and 3 of unidentified tuna were sighted on overlaps between day's runs on the offshore survey. None of these schools was chummed.

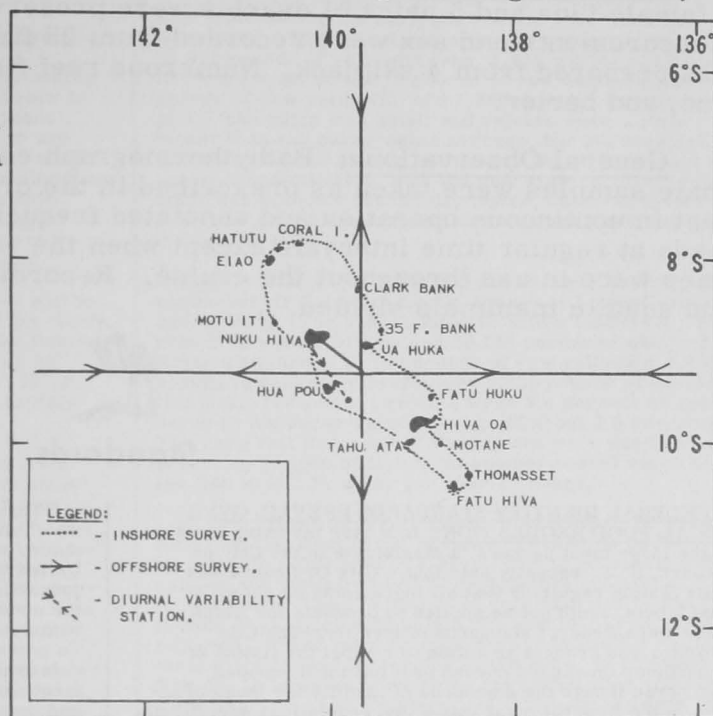
Bait: The vessel carried 32 buckets of nehu and 2 of acclimatized tilapia on the run to the Marquesas. Surface schools of equatorial tuna could not be fished because of the death of the bait prior to reaching the grounds.

A total of 722 buckets of Marquesan sardines (*Harengula vittata*) was collected along with small quantities of non-bait species. Of this amount, 652 buckets were captured in daytime sets and 70 buckets at night. Taiohae and Haka Ui (Nuku Hiva) provided 388 and 204 buckets, respectively, while Hanga Haa and Haka Puuae (Nuku Hiva), Taa Huku (Hiva Oa), and Hananai (Ua Huka) furnished small quantities of bait. Sardines were scarce or absent at Haka Tea, Houmi, Anaho, and Hatiheu (Nuku Hiva), Haka Nai (Hua Pou), and Hananui, and Vai Take (Ua Huka). Bait was nowhere sufficiently abundant to warrant the use of a receiver.

Included in the above figures are 230 buckets of sardines collected for introduction into Hawaiian waters. Survival of this bait was fairly good, and 148 buckets were released at Ewa, Oahu, on February 25, 1958.

The sardines collected behaved well as chum but may have been slightly too large for the smaller skipjack fished. Sardines larger than 120 millimeter fork length were common, with many of these being ripe or spawned females. Length-frequency and gonad condition were recorded from 25 sardines from each of the larger sets, and a representative sample of sardines was preserved from each baiting locality. Experiments showed the Marquesan sardine to have a broad salinity tolerance.

Plankton and Night-Lighting: Ten half-hour, 0-140 meter plankton tows were made at night on the run to the Marquesas, and 10 on the run back to Honolulu. Twenty-two 0-140 meter tows (2 per night) were made on the offshore survey, and 12 more were taken on the diurnal variability station. Ten half-hour surface tows



M/V HUGH M. SMITH CRUISE 43 (JAN. 3-FEB. 25, 1958).

were made with an Atlas flowmeter and 4 using a Rigosha flowmeter; all surface samples were frozen. Twenty-five nonquantitative plankton samples were taken with a 45-centimeter net from sardine-baiting sites. Two night-light stations were conducted in the Marquesas.

Specimens Preserved: In addition to the above, the stomachs from 5 male and 5 female tuna and 5 pairs of ovaries were preserved from all schools fished. Length measurements and sex were recorded from 25 fish per school. Frozen blood serum was prepared from 4 skipjack. Numerous reef fish were collected by seine, hand-line, and barter.

General Observations: Bathythermograph casts and surface salinity and phosphate samples were taken as prescribed in the cruise plan. The thermograph was kept in continuous operation and annotated frequently. Weather observations were made at regular time intervals except when the vessel was in bays. Four trolling lines were in use throughout the cruise. Records were kept of tuna schools, birds, and aquatic mammals sighted.



Standards

FEDERAL IDENTITY STANDARDS PREVAIL OVER LOCAL FOOD REGULATION: In a case involving most of the large meat packers, a Magistrate in the City of Newark, N. J., recently held that a City Ordinance and State Statute requiring that all ingredients be shown on food labels, could not be applied to products for which there were Federal standards of identity. The City Solicitor had brought an action to compel the listing of ingredients on canned corned beef hash and chopped ham, even though the standards of identity for these products in the Federal meat inspection regulations specifically provide that the ingredients need not be shown on the label.

The principal issue in the case was whether Federal laws have pre-empted the field of food regulation, thereby preventing the enforcement of local laws that prescribe more stringent requirements for the labels and contents of food products. This doctrine of Federal pre-emption is derived from the "supremacy clause" in Article VI of the Federal Constitution, which provides:

"This Constitution, and the Laws of the United States which shall be made in pursuance thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the constitution or laws of any state to the contrary notwithstanding."

In oral argument before the Magistrate, counsel for the meat canners called attention to several state decisions and opinions supporting the supremacy of Federal laws in this area. He also cited numerous decisions of the Supreme Court of the United States striking down state laws that conflict with or infringe on the policy of Federal laws. At the conclusion of the argument the Magistrate dismissed all of the complaints against the packers on the ground that the Federal Meat Inspection Act and Regulations covered the labeling of meat products and the "supremacy clause" prevented the enforcement of more restrictive state laws.



Tuna

NEW DEVELOPMENTS IN FREEZING TECHNIQUES ON PURSE SEINERS: During 1957 a new method for freezing tuna on vessels was developed by a practical Pacific Coast fishing vessel engineer with 14 years of experience in the use of standard coil and brine-freezing systems. The system has been installed and used for six trips since the first of 1957 and in at least one of the trips the system was subject to a severe test. Since the standard-type coil system does not have the capacity to freeze large lots of fish without auxiliary ice, purse-seine vessel owners are enthusiastic about the possibilities of the new system.

Many tuna purse-seiners equipped with the standard coil system were faced with a costly job of converting their vessels to a brine-freezing system or being forced out of the highly competitive tuna fishery. This new system, which according to reports, can be installed for \$10,000 or less on vessels with coil equipment, would make it possible for these tuna purse-seine vessels to compete with the vessels equipped with a brine-freezing system. The problem that has plagued tuna vessels equipped with a standard coil refrigeration system has been one of enough refrigeration capacity to refrigerate a large tonnage of fish under the handicap of high water and air temperatures.

According to the inventor, "the new refrigeration system is essentially a brine system which builds a reserve of ice to meet refrigeration needs with a minimum of machinery." He also states that further experimentation is necessary before the most efficient installation can be developed.

At the present time the system has been installed aboard the *Jo Ann*, a standard Pacific coast-type purse seiner with a length of 79.3 feet, a beam of 22.4 feet, and a draft of 10.3 feet. The capacity of this vessel prior to the installation of the new system was 110 short tons of frozen tuna. With the new system, the capacity is only slightly less.

The system consists of the standard type ice machine and coils. The regular coils have been augmented by a smaller coil which is placed just above the regular coils. Water is circulated and sprayed on the refrigerated coils, gradually building up a large mass of ice as much as 1 foot in diameter on the refrigerated coils. The entire hold has been made into a watertight compartment. Prior to the catching of fish, the ice-making machinery is put in operation, and ice is built up around the coils. The fish are placed in the hold after they are caught, and brine water is released into the watertight hold. The ice (which was built up around the coils) melts, and cools the brine water. The cold brine

water is then circulated to freeze the fish. In addition, more water is sprayed on the pipes where the ice has been built up, and as this cold water drips on the fish it also chills the fish. The addition of catches on top of already-frozen fish seems to have no effect, the frozen fish being sufficiently cold so that they are not thawed. In fact, the ice that has been built up on them is helpful in cooling the brine water which is being circulated to freeze the new catch.

Benefits to be anticipated with the new freezing system:

(1) Efficiency will be increased in loading and unloading because the fish can be brought aboard and stowed below in about half the time required on a standard coil vessel. This is an extremely valuable factor when the fish are schooling as at that time every hour gained can be worth days and even weeks of searching. In this new method, the fish are brailed directly from the water into the hold through the hatch or the manholes, instead of being first brailed on the deck and stowed below later, as is the custom in the vessels equipped with standard coil systems.

(2) The quality of the fish will be better because it will be in the hold and under refrigeration in about half the time previously taken. When one considers that on the fishing grounds the water temperature is often as high as 85° - 90° F., with an air temperature of from 100° to 120° F., speed in getting the fish under refrigeration as rapidly as possible is vital.

(3) The back-breaking work of going below and icing fish, which is necessary in vessels equipped with standard coils, is virtually eliminated. Now only 1 or 2 men go below when the fish are being brailed into the hatch, and these men simply steer the fish so that they lay fore and aft. The *Jo Ann's* hold is divided into three compartments extending fore and aft for the full length of the storage space. These three compartments keep the fish from rolling about in the hold and damaging themselves or possibly piling up on one side of the vessel and causing a list. The compartments also aid in unloading, as one compartment can be completely unloaded to the bottom of the compartment, and then it is much easier to unload the other two on either side. Formerly, when the fish were brailed on deck, it was necessary for at least 8 men to go below, break loose the ice that was carried by the vessel, and then have the fish passed down to them through manholes or the main hatch. The fish were then stowed in bins which were made of removable planks. Generally a layer of fish was stowed, and a layer of ice shoveled on top of them. This process continued until that bin was filled, and proceeded from bin to bin until the vessel was fully loaded. Due to the cramped quarters in which the men worked, and the large quantities of ice which were carried, there was much shifting of ice from bin to bin and a great deal of manual labor. All of this work has been eliminated and the physical efficiency of the crew is not taxed as heavily, with the result that the crew will be able to concentrate their physical activity on capturing fish when they are running. In the past after a heavy set crews would be exhausted and would have to rest rather than fish available schools. There is also the possibility that 1 or

2 men can be eliminated from the crew. This would result in an increase of earnings for the remaining crew members, and would amount to from \$75 to \$100 a crew member per trip for each man less.

Since installing this new system, the *Jo Ann* made three trips in the early part of 1957 with the following results:

Trip 1: The length of the trip was 65 days. The trip was made during the early part of the year when fishing was spotty. The vessel came in with a short load, 79,070 pounds of yellowfin tuna, 8,405 pounds of skipjack. Rejects amounted to 775 pounds of raw skipjack, 980 pounds of raw yellowfin, and 1,890 pounds of cooked skipjack. The catch was small and rejects were a little higher than the purse-seine average, but the crew felt that this was due mostly to mishandling on their part because of unfamiliarity with the new system. The equipment was not considered fully tested, but from the experience gained some modifications were made before the second trip.

Trip 2: The length of the trip was 24 days. Fishing was conducted off Cabo San Lucas, the tip of Lower California, and vicinity. The vessel came in with a load of 120,560 pounds of yellowfin tuna and 56,145 pounds of skipjack. Rejects amounted to 180 pounds of raw yellowfin, 1,440 pounds of cooked yellowfin, and 2,880 pounds of cooked skipjack. The average rejects were 2.4 percent as compared to the purse-seine average of about 2.5 percent. The crew felt that most of the rejects were due to their receiving 20 tons of fish from another vessel which had the fish in 80° F. water for over 15 hours.

Trip 3: This was practically a record trip. The vessel fished on the West Coast of Lower California and returned with a full load in 8 days. Due to unloading difficulties, the vessel waited 20 days before unloading. The vessel landed 124,075 pounds of yellowfin and 72,815 pounds of skipjack with only 2,875 pounds of raw skipjack rejected. There were no cooked rejects and the raw rejects were caused, according to the crew, to smashed fish due to large catches which prevented good sorting. This trip served as a severe test of the new system of refrigeration, and in the opinion of observers proves that the system is a success.

The principle of this type of refrigeration is not completely new, but the method is probably unique. At any rate it is the first time it has been adapted to a purse-seine vessel fishing tuna. It is also the first time that a converted coil system has been used to refrigerate fish under such warm water and air temperatures. Vessel owners and fishermen are enthused and predict a great future for the system, and as of April 1958 two other purse seiners installed similar systems and one seiner installed it partially.

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* * * * *

YELLOWFIN, SKIPJACK, AND BIG-EYED TUNA FISHERIES TRENDS: Trends in the domestic yellowfin, skipjack, and big-eyed tuna fisheries is the subject of a report submitted to the President and the Congress on May 22 by the Secretary of the Interior Fred A. Seaton.

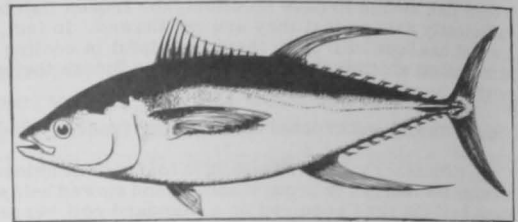
The report was made under provisions of the Fish and Wildlife Act of 1956. Section 9(b) of that Act authorizes the Secretary of the Interior, upon specific request, to determine whether or not there has been an adverse trend in a domestic fishery, and whether or not there has been an increase in imports of a directly competitive product.

The tuna industry, the report points out, is composed of many segments--large canners, small canners, importers, fishermen, and operators of such large vessels

as bait boats and purse seiners and of such smaller craft as albacore trollers. Each group is confronted with different problems, mainly associated with the species involved or the stage at which it handles the tuna.

The report, which presents findings and not recommendations, shows that:

The United States landings of yellowfin and skipjack in 1957 were 237,113,000 pounds, 27 percent below the 1950 peak of 324,711,000 pounds.



Yellowfin Tuna
(*Netothonnus macropterus*)

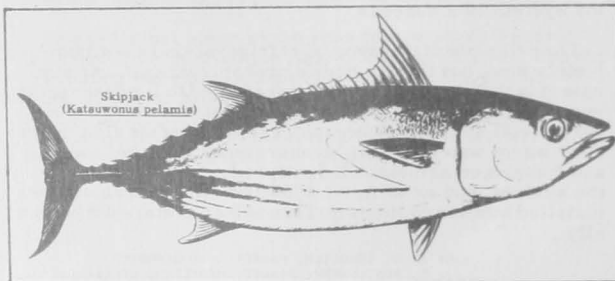
The number of bait boats over 50 gross tons participating in this fishery declined from 210 in 1951 to 146 in 1957, and the carrying capacity dropped from 44,300 tons to 33,875 tons.

The average ex-vessel price for yellowfin declined 25 percent from \$345 per ton in 1954 to a low of \$258 per ton in 1957; that the skipjack price declined 28 percent from \$304 to \$220 a ton in the same period.

The number of employees on bait boats dropped from 2,730 in 1951 to 1,989 in 1956; on purse seiners from 1,661 in 1949 to 827 in 1956.

Imports of all types of tuna (adjusted to whole-weight equivalents) accounted for 6 percent of the available supply of tuna in the United States in 1948, 39 percent in 1956, and 46 percent in 1957.

Imports of all tuna (adjusted to whole-weight equivalents) averaged less than 20 million pounds annually in the 1940's, jumped to 117,100,000 pounds in 1950, and to an estimated 259,600,000 in 1957.



Skipjack
(*Katsuwonus pelamis*)

According to the report, such adverse trends as declining landings and lower prices for domestic tuna have been intensified by the general upturn in costs, which has increased the cost of operations for the United States tuna producers. The American fishery must compete with foreign fisheries having lower vessel construction costs, long-term loans at low interest rates, and government subsidies which have facilitated the construction, rebuilding, and insuring of vessels.

While the Japanese high-seas tuna fleet has practically doubled its capacity since 1951, vessel construction in the California yellowfin and skipjack fishery has stagnated and only nine new large vessels have been added to the bait-boat fleet since 1951. As of November 1957, most of the 146 vessels in that fleet were about 13 years old, and owners have had little incentive to make replacements or additions to the fleet.

The tariff rates established by the Tariff Act of 1930 and since modified by trade agreement, are based mainly on the import pattern at that time. The present duty on canned tuna in oil is 35 percent ad valorem; on canned tuna in brine, 12½ percent; on frozen cooked loins and discs, one cent a pound; fresh or frozen raw tuna, no duty. The duty on cooked tuna is equivalent to about 3.3 percent ad valorem.

The report, including several pages of tables and charts, covers such items as the world tuna fisheries, United States tuna fisheries, the Eastern Pacific fishery for yellowfin and skipjack, trends in vessel operations, trends in employment in the fisheries, price trends, effect of imports on domestic prices and operating costs, Japanese production, and the import situation.

United States Fishing Fleet^{1/} Additions

MARCH 1958: A total of 51 vessels of 5 net tons and over were issued first documents as fishing craft during March 1958--10 more than during March 1957.

Area	March		Jan.-March		Total
	1958	1957	1958	1957	
	(Number)				
New England . . .	1	-	3	3	19
Middle Atlantic . .	-	5	3	10	23
Chesapeake	7	5	24	22	104
South Atlantic . .	9	8	32	19	130
Gulf	26	12	61	22	166
Pacific	5	9	18	14	102
Great Lakes . . .	-	-	2	-	8
Alaska	3	2	3	8	48
Puerto Rico . . .	-	-	-	-	1
Virgin Islands . .	-	-	1	-	-
Total	51	41	147	98	601

NOTE: VESSELS ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORTS.

Net Tons	Number
5 to 9	18
10 to 19	4
20 to 29	3
30 to 39	14
40 to 49	12
Total	51

The Gulf led all other areas with 26 vessels, followed by the South Atlantic area with 9, the Chesapeake area with 7, the Pacific with 5, Alaska with 3 and the New England area with 1 vessel.

^{1/}INCLUDES BOTH COMMERCIAL FISHING AND SPORT FISHING CRAFT.



U. S. Foreign Trade

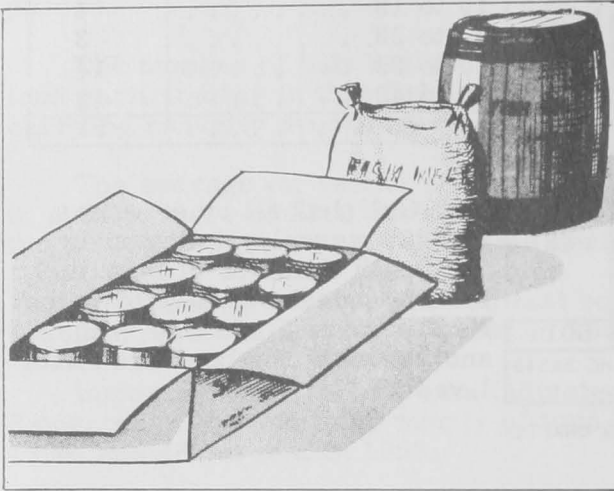
GROUND FISH FILLET IMPORTS, MAY 1958: During May 1958, imports of groundfish and ocean perch fillets and blocks amounted to 11.0 million pounds. Compared with the corresponding month of last year, this was an increase of 2.3 million pounds (26 percent) according to data obtained from the U. S. Bureau of Customs and published by the Bureau of Commercial Fisheries. Gains of 1.1 million pounds from Iceland and 854,000 pounds from Denmark were mainly responsible for the over-all increase.

Canada continued to lead all other countries exporting groundfish and ocean perch fillets to the United States with 7.6 million pounds during May 1958. Denmark was next with nearly 1.3 million pounds, followed by Iceland with 1.2 million pounds. The remaining 908,000 pounds were accounted for by West Germany, Norway, France, the Netherlands, and the United Kingdom.

Imports of groundfish and ocean perch fillets and blocks into the United States during the first five months of 1958 totaled 56.4 million pounds. Compared with the same period of last year, this was an increase of only 77,000 pounds (less than 1 percent). Shipments originating in Canada comprised 67 percent during the 1958 period, while Iceland made up 19 percent of the total, and Denmark accounted for 9 percent. The remaining 5 percent was represented by West Germany, Norway, Miquelon and St. Pierre, the Netherlands, the Union of South Africa, and the United Kingdom.

NOTE: SEE CHART 7 IN THIS ISSUE.

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-FEBRUARY 1958: In the first two months of 1958, imports of many of the major edible fishery products were slightly behind the same period of 1957. In the two-month period, imports of groundfish fillets (excluding blocks) were down 20 percent, frozen tuna 6 percent, canned bonito 31 percent, and lobster 31 percent. Commodities imported in larger amounts during January and February were canned tuna, canned sardines, tuna loins and discs, swordfish, and canned crab meat. Groundfish blocks, shrimp, and canned salmon imports were about the same. Imports of fish meal were about double for the two-month period of 1958 as compared to 1957.



Exports of all major fishery products decreased during the first two months of 1958 as compared with the same period of 1957.

Imports: FROZEN TUNA: During the first two months of 1958, imports were 23.0 million pounds, 6 percent less than in the same period of 1957; most of the decrease was in albacore, "other tuna" increased slightly. Imports from Japan were almost double those of the first two months in 1957, but imports from Peru were 74 percent less.

Tuna loins and discs: Imports for the first two months of 1958 were 2.0 million pounds, or 74 percent more than in the similar period last year. Japan, Peru, and Cuba were the principal sources.

CANNED TUNA: In the first two months this year, 4.5 million pounds were imported, 13 percent more than in the same 1957 period; albacore was down 24 percent and other tuna was up 42 percent.

GROUND FISH: Imports of groundfish (including ocean-perch) fillets for January and February 1958 were 13.0 million pounds, 20 percent less than for the comparable period of 1957; blocks were about the same.

SHRIMP: Imports during the first two months of 1958 were 10.2 million pounds, an increase of 2 percent over the similar period of 1957.

CANNED SALMON: For the first two months of 1958, imports of 5.2 million pounds were about equal to those for the same period in 1957.

FRESH AND FROZEN LOBSTER: The January and February imports this year were 6.1 million pounds, a 31-percent decrease as compared with the same months last year. Imports decreased from all major suppliers except the Union of South Africa.

CANNED SARDINES: Total imports for the first two months in 1958 were 5.8 million pounds, an increase of 59 percent as compared with the same period in 1957. The increase was largely of sardines not in oil from the Union of South Africa.

CANNED BONITO: The January and February 1958 imports totaled 2.0 million pounds, 31 percent less than for those months last year.

SWORDFISH: At the end of the first two months of 1958, imports were 16 percent more than at the same time in 1957.

CANNED CRABMEAT: In January and February this year 709,000 pounds were imported, 36 percent more than for the same months last year.

FISH MEAL: Imports the first two months of 1958 were 18,915 tons, 103 percent ahead of the similar 1957 period. Imports from Peru and Angola accounted for the increase.

Exports: CANNED SARDINES: Exports during the first two months of 1958 of 1.7 million pounds were 64 percent less than in that period of 1957. Exports were down to all principal countries of destination, due to the small California sardine pack during the past year.

CANNED MACKEREL: Exports during January and February 1958 were 76 percent less than in 1957, due also to a light pack in California. The principal decline was in exports to the Philippines.

CANNED SALMON: For January and February 1958, exports were 222,000 pounds, 65 percent below that period in 1957.

FISH OIL: For the first two months of 1958, exports were only 14.0 million pounds, 31 percent less than in that period last year. Although exports were less to most markets the first two months of 1958, exports to Canada exceeded those for the entire year of 1957.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA PROVISIO, JANUARY 1-MAY 3, 1958: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1958 at the 12½-percent rate of duty has been established as 44,693,374 pounds. Any imports in excess of this established quota will be dutiable at 25 percent ad valorem.

Imports from January 1-May 3, 1958, amounted to 12,490,111 pounds, according to data compiled by the Bureau of Customs.



Virginia

ABUNDANCE OF MENHADEN IN 1959 PREDICTED: Menhaden or bunkers, scarcer in recent years than in the banner year of 1955, may come back in tremendous numbers in 1959, say biologists of the Virginia Fisheries Laboratory, Gloucester Point. They base their opinion on the tremendous abundance of tiny menhaden in Chesapeake Bay and its tributaries this spring.

On a recent survey with experimental trawls, the research vessel Pathfinder of the Virginia Laboratory caught large numbers of tiny menhaden, about 1.5-inch long, in the lower part of Chesapeake Bay off the mouth of the York River, and in the York River itself. Baby menhaden also have been observed in tremendous numbers well up the James River.

This trawl catch is quite remarkable, for the meshes of the net are large enough to allow much bigger fish to escape. Small fish are brought on deck with this net only when they are very abundant.

By late summer these young fish, born last fall and winter, will be about 5 inches long. They will begin to appear in pound-net catches in August or September, but will not be caught in any quantity by the menhaden purse-seine fleet until 1959. If present indications are reliable, the early 1960's may rival the mid-1950's in numbers of menhaden caught. In 1955 more than 300 million pounds of these herring-like fish were landed in Virginia--71 percent by weight of the entire Virginia catch of fish and shellfish.

The biologists are careful to point out that the accuracy of this forecast may be affected by many things. "Survival of the fish to commercial size may be poor, or their migrations may carry them to regions inaccessible to the fishing fleet. Nevertheless, in 1951 we predicted good catches ahead on the basis of similar evidence, and this forecast was amply confirmed a few years later."

Virginia and U. S. Bureau of Commercial Fisheries biologists, who are conducting a major investigation of this important fishery, will follow the progress of this new brood of menhaden with great interest. Within a year they should have good evidence as to how abundant these new fish really are.

* * * * *

FRESH-WATER FISH FROM RIVERS TRIBUTARY TO CHESAPEAKE BAY INVADE SALT WATER: Virginia fishermen have seen unusual numbers of carp in the York, Rappahannock, and other Chesapeake Bay tidal waters of Virginia during the spring months of 1958. Biologists of the Virginia Fisheries Laboratory, Gloucester Point, report blue gills, white catfish, and gar caught in traps near the mouth of the York and Rappahannock Rivers.

One of the fishery biologists attached to the Laboratory states, "I do not recall seeing such numbers of fresh-water fish in salt-water areas any time during the past ten years. Fresh-water fish caught in the York River and held in tanks filled with York River water never survive more than two weeks. Under natural conditions these fish must return to fresh water within a relatively short period or die. On the other hand, some common salt-water fishes invade fresh water and live there successfully for weeks or months. Young croakers, spot, and hogchokers are found in the Mattaponi and Paumunkey Rivers and occasionally bluefish and flounder stray into fresh water. Salt-water fish can tolerate a longer stay in fresh water than fresh-water fish in salt water. Heavy rains of the past few weeks undoubtedly are responsible for this unusual situation."

* * * * *

UPPER SEED AREA IN JAMES RIVER SUSTAINS HEAVY OYSTER MORTALITY: Unusually heavy spring rains have aroused considerable concern for the seed oyster beds in James River. Oysters are unable to feed in water containing less than one-seventh as much salt as found in ocean water, say biologists at the Virginia Fisheries Laboratory at Gloucester Point. They believe that many oysters above Wreck Shoal Bar in the James River have been deprived of salt water since mid-April. Wreck Shoal is in the middle of the seed area.

The over-all picture at present is one of minor losses in the lower half of the seed area from Wreck Shoal downriver but increasing losses of oysters with distance upriver, report the biologists. Deep Water Shoal, the important last bar upriver, has experienced a mortality well over 50 percent.

Frequent examinations in James River since mid-April have shed new light on the ability of oysters to withstand unfavorable conditions. Oysters tonged from fresh water had no heartbeat when opened and showed no sensitivity.

When placed in salt water, oysters long closed by fresh waters, though seemingly dead, revived quickly. The fine hairs used for pumping water began working within minutes, and feeble heartbeats were detected in ten minutes.

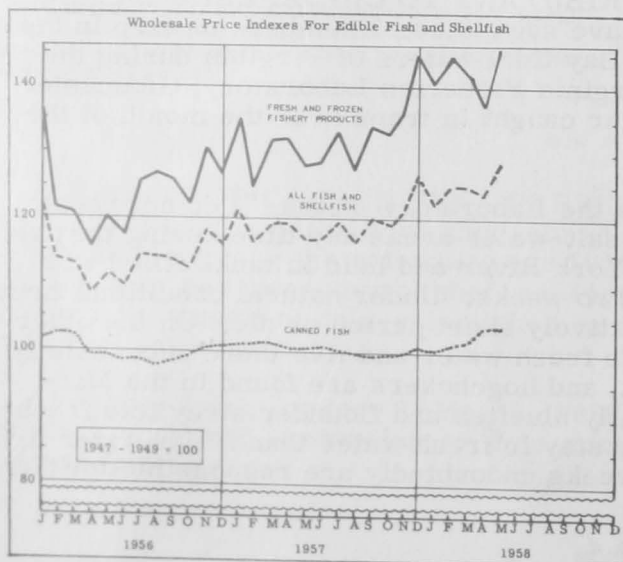
By remaining closed, oysters are able to tolerate fresh water for weeks--if temperatures are not too high and if oysters are slowly acclimated to these conditions, say the biologists. They believe that fat oysters are more likely to survive than poor ones.

Boxes or hinged empty shells appear to be breaking apart rather rapidly thereby destroying the evidence of oyster deaths, but tongers will probably note a scarcity of oysters in the upper seed area next fall.



Wholesale Prices, May 1958

WHOLESALE PRICES, MAY 1958: Because landings were lighter than seasonally expected and because stocks of most frozen products were depleted, the amount of fish and shellfish available was not adequate to meet the needs of the fresh fish market and the processors. The edible fish and shellfish (fresh, frozen, and canned) wholesale



price index (128.6 percent of the 1947-49 average) in May rose 4.6 percent over that for April and was 9.9 percent higher than in the same month of 1957.

All products under the drawn, dressed, and whole fish subgroup were higher in May than in April. The index for the subgroup rose 20.0 percent from April to May and was 37.4 percent higher than a year earlier. From April to May, prices rose for fresh large offshore haddock at Boston by 25.7 percent, fresh and frozen king salmon at New York City by 20.5 percent, and substantially also for frozen halibut, whitefish at New York City and Chicago, and yellow pike at New York City. Compared with May 1957, prices this May were higher for fresh large offshore haddock by 31.4 percent, for frozen halibut by 19.9 percent, for fresh and frozen king salmon by 23.8 percent, and also for all the fresh-water fish included in the subgroup.

Since the active selling season for oysters ended in April, shucked oyster prices dropped in May and almost offset the increase in the prices for fresh haddock fillets (up 14.5 percent) and shrimp (up 1.1 percent). Prices this May as compared with May of 1957 were lower for fresh shrimp at New York City and shucked oysters, but substantially higher (up 12.5 percent) for fresh haddock fillets at Boston. The subgroup index for fresh processed fish and shellfish was up 0.5 percent from April to May, but was 0.3 percent lower than in May 1957.

Higher frozen shrimp prices at Chicago this May were only slightly offset by lower prices for frozen haddock fillets, while prices for frozen flounder and ocean perch fillets remained steady at April levels. Compared with May 1957, prices this May were higher for frozen ocean perch and haddock fillets, unchanged for frozen flounder

fillets, and lower for frozen shrimp at Chicago. The May 1958 index for the processed frozen fish and shellfish subgroup index was up 1.3 percent from April to May, but down 2.4 percent from a year earlier because the drop in shrimp prices more than offset the rise in ocean perch and haddock fillet prices.

There were no changes in the prices for canned fishery products from April to May, but prices were 3.1 percent

higher than a year earlier more because of a shift in pricing specifications rather than an actual price increase. Compared with May 1957, prices this May were higher for canned tuna, the same for canned pink salmon, but slightly lower for canned Maine sardines. The higher prices for canned California sardines were principally due to a shift in pricing specifications from 48 15-oz. cans per case to 24 15-oz. cans per case.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1958 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)			
			May 1958	Apr. 1958	May 1958	Apr. 1958	Mar. 1958	May 1957
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					128.6	3/122.9	124.8	117.0
Fresh & Frozen Fishery Products: 2/					146.0	136.4	141.1	128.2
Drawn, Dressed, or Whole Finfish:					148.3	123.6	126.4	107.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.08	101.7	80.9	91.2	77.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.34	106.7	104.7	99.0	89.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.80	.66	179.8	149.2	142.4	145.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.77	.74	190.9	183.4	185.9	166.1
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	1.00	.68	202.2	136.5	161.8	161.8
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.48	.31	111.4	72.7	158.3	82.1
Processed, Fresh (Fish & Shellfish):					142.7	142.0	144.6	143.2
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.36	.32	122.5	107.2	119.1	108.9
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.95	.94	150.1	148.5	151.7	151.7
Oysters, shucked, standards	Norfolk	gal.	5.50	5.63	136.1	139.2	139.2	142.3
Processed, Frozen (Fish & Shellfish):					134.1	132.4	140.9	130.9
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	103.4	103.4	106.0	103.4
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.34	.35	106.7	109.9	125.6	92.6
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.30	.30	118.8	118.8	118.8	114.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.91	.88	140.0	135.8	144.3	145.8
Canned Fishery Products:					104.3	104.3	101.8	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	23.00	23.00	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.),	Los Angeles	cs.	11.65	11.65	84.0	84.0	82.9	80.8
48 cans/cs.								
Sardines, Calif., tom. pack, No. 1 oval (15 oz.),	Los Angeles	cs.	5.68	5.68	4/132.4	4/132.4	113.8	105.0
48 cans/cs.								
Sardines, Maine, keyless oil, No. 1/4 drawn	New York	cs.	7.50	7.50	79.8	79.8	74.3	81.9
(3-3/4 oz.), 100 cans/cs.								

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs.

These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

^{2/}The index for fresh and frozen fishery products for January 1958 was revised from 137.4 to 140.3 and for February 1958 from 141.4 to 144.9.

^{3/}Revised.

^{4/}Revised to take care of a shift in specifications from 48 15-oz. cans per case to 24 15-oz. cans per case.

