Alaska

CANNED FISHERY PRODUCTS PACK, 1962:

Preliminary data compiled by the Alaska Statistical Office indicates that the Alaska canned fishery products pack in 1962 amounted to 3,802,700 standard cases valued at $101,380,000 as compared with 3,514,300 cases valued at $105,411,000 in 1961. The explanation for the lower value in 1962 is that in 1961, high priced red (sockeye) salmon dominated the pack, while in 1962 the pack shifted to the less expensive pink salmon.

The canned salmon pack in 1962 was 3,511,100 cases (48 1-lb. cans) valued at $93,710,000, up 299,000 cases and down $4,586,000 when compared with 1961. In 1962, the pack of smoked salmon was 382 cases valued at $47,100, up 82 cases and $16,300. The pack of king crab was 178,700 cases valued at $5,519,600, up 28,200 cases and $947,700 in 1962. The pack of Dungeness crab was 16,300 cases valued at $504,400 in 1962, down 1,000 cases and $25,900. The shrimp pack in 1962 was 86,200 cases valued at $1,378,900, down 26,600 cases and $189,500. The 1962 clam pack of 10,200 cases valued at $220,400 was down 9,000 cases and $189,000 from the previous year.

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HERRING BAIT FISHERY:

As of May 1, 1963, an Auke Bay firm had taken 1,300 barrels of 325,000 pounds of bait herring from the Indian Point herring pound. About 1,000 barrels of the herring were taken to Juneau and frozen, to be sold to halibut fishermen. Also, 300 barrels were delivered to Petersburg for freezing and storage. The smaller herring were separated and frozen for use by the troll fishermen.

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GILL-NET SEASON OPENS AT TAKU INLET:

The gill-net fishing season for Taku R king salmon opened on April 29. From th date until June 14, the weekly fishing per lasted just 24 hours, starting on Monday 12:01 p. m. and ending on Tuesday at 12:01 According to several of the fishermen co tacted the fishing was poor. Low tides an cold weather were the most common fact blamed for the slow fishing. All of the fis caught were taken close to the "lead line bottom of the net. The fish were generall smaller than expected at that time of yea About half of those seen at the cold-stora warehouse in Juneau were feeders averag about 8 or 9 pounds. The few mature fish caught averaged around 22 pounds each.

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COLD-STORAGE PLANT INSTALLS PNEUMATIC HEADER FOR HALIBUT:

The installation of an air-driven halib heading machine at the cold-storage plan Juneau will speed up the processing of ha this year, according to the Juneau mana of the Halibut Producers Co-op. Fisher are paid on a headless basis and it is th fore necessary that accurate figures be for converting the fish to headless weigh Experience gained at another Alaskan co storage plant, where an air-driven headi machine has been used for the last two y indicated deductions for heads of 12 per for chickens, 11 percent for medium, an percent for large fish. In addition, a $2\frac{1}{2}$-p cent deduction is made for ice and slime.

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HALIBUT LANDINGS AT KETCHIKAN:

The first three vessels of the 1963 Pa halibut fishing season arrived in Ketchik on April 12, with their catches of halibut

rom the eastern Bering Sea. The prices offered by two cold-storage firms were 21 cents or large, 23 cents for medium, and 12 cents or chickens. Because those prices were at east 10 cents lower than last year, one of the essels refused to sell and immediately left or Seattle. The other two vessels sold in etchikan later in the day for ½ cent more an the morning offer. A fourth vessel sold Ketchikan on the following day, but only 1 or 2 additional vessels landed fish in Ketchan during April.

* * * * *

ING CRAB FISHERY AT ODIAK SLOWS DOWN:

Information received from Kodiak in April ndicated that the king crab fishery to westward had slowed down for the annual molt eason. Catches were expected to be small rom then until mid-July.

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AXMAN TO PRINCE RUPERT AIL-BARGE IN OPERATION:

The first large load of rail cars arrived t the Ketchikan and Northern Terminal Company at Saxman, near Ketchikan, on April 20. hose first rail cars carried boats, an electric utility substation, and general merchandise to Ketchikan from midwest suppliers ia the Canadian National Railroad to its rince Rupert railhead and then by barge to he new terminal. The new rail-barge facility was financed by an Area Redevelopment dministration (ARA) loan, and offers promse of lowering the high cost of freight from he central and eastern United States to southastern Alaska. It will also permit Alaska hippers to enter the midwest and eastern arket at transportation rates competitive ith those of Seattle. In addition, handling nd shipping time can be reduced on fishery roducts which could result in improved uality to the consumer.

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RA LOAN AND GRANT FOR SELDOVIA:

A $272,000 public facility loan and grant o help rebuild and expand water facilities n Seldovia has been approved by the Area edevelopment Administration (ARA). Seldovia canneries have experienced water problems in past years, and expanding operations rocessing king crab, shrimp, and Dungeness rab as well as salmon require more adequate water facilities. ARA funds will permit Seldovia to enlarge its water supply reservoir; replace supply lines, pressure station, gas chlorinator house, and distribution mains; and to add new distribution mains.

Alaska Fisheries Investigations

GOOD OVERWINTER SURVIVAL OF PINK AND CHUM SALMON AT OLSEN BAY:

The Olsen Bay intertidal spawning area was sampled during March 8-19, 1963, for preemergent fry to determine overwinter survival, and analysis of the data was completed in April. Mean densities of live pink salmon fry ranged from none per square meter at the 3- to 4-foot tide level to 678 per square meter at the 10- to 11-foot level. Within the productive 4- to 11-foot portion of the intertidal zone, the intermediate 8- to 9-foot level had the lowest density of live fry (99 per square meter) and the highest density of dead eggs (1,168 per square meter).

Live fry densities during the spring of 1963 were similar to those in the spring of 1961 when a maximum of 786 pink salmon fry per square meter were present at the 10- to 11-foot tide level. Overwinter survival based on live egg densities in October 1962, and live fry densities this spring ranged from 0.0 to 9.0 percent in four strata tested below the 10-foot level. Maximum survivals of 20.2 percent for pink salmon and 38.6 percent for chum salmon occurred within the 10- to 11-foot tide level. High overwinter mortalities of more than 98 percent occurred within the low gradient 8- to 10-foot stratum. Survival of pink salmon from a potential egg deposition of 8,426 per square meter was 8.0 percent at the 10- to 11-foot level. The potential deposition of 4,702 chum salmon eggs per square meter survived at the rate of 9.9 percent in the same area.

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RESEARCH VESSEL "MURRE II" REPAIRED AND CONVERTED FOR OCEANOGRAPHIC RESEARCH:

In April, the 88-foot Murre II oceanography research power barge was put on the ways of a local Juneau firm, where a new drive shaft was installed for the starboard engine and repairs made to the bottom shaft bearings and housing. By mid-May the vessel was expected

to be in first class shape and installation of instruments completed so it could begin a full season of cruise patterns to gather data needed for salmon and oceanographic programs in Southeast Alaska.

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CAROTENOID STUDY AT KETCHIKAN TECHNOLOGICAL RESEARCH LABORATORY:

One attribute of major importance in consumer acceptance of Alaska salmon and shellfish products is the natural red color due primarily to the polyene pigment astaxanthin or its derivatives. Stability of the pigments is dependent upon several factors: species, season, methods of processing and preservation, physiological state of the animal at the time of capture, etc.

A notable example of the effect of species differences is illustrated by different reactions to canning shown by salmon species commercially important to Alaska. The color of king crab meat although not severely affected by the freezing process followed by reasonable lengths of storage, is altered to a greater extent when the product is canned. In addition, the method of cooking king crab has a marked effect on color. In shrimp, the delicate pink color is almost entirely lost in machine peeling. This color change is more severe in the larger shrimp species. Since alteration of these pigments is markedly accelerated by exposure to heat and light and by the process of oxidation, carotenoids will be studied to assist in the solution of the problem of color change in fish and shellfish.

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FOREIGN FISHING ACTIVITIES IN THE BERING SEA AND GULF OF ALASKA:

The foreign fishing fleet build-up continued apace in April and by the end of that month there were nearly 200 Soviet Union and 35-40 Japanese fishing vessels in the Bering Sea and Gulf of Alaska.

U. S. S. R.: More than 100 Soviet Union fishing vessels were identified off Chirikof Island (SW. of Kodiak Island). This already exceeds the total number of Russian vessels identified with the fleet in the Gulf of Alaska during peak strength last year in July and August. The fleet was sighted on April 17 moving eastward from Unimak Pass. All uni had dry decks and stowed gear and all were heading in the same direction into the Gulf Alaska. It is believed that the fleet now consists of 100 SRT trawlers, 15-18 refrigerat vessels, 5-6 stern trawlers, and various su port vessels. The fleet was operating 12 to 30 miles off Chirikof Island presumably for Pacific ocean perch.

The Soviet whale factoryship Vladivostok of 17,600 gross tons was reported operatin in the Western Aleutians. This is a new ult modern vessel with processing facilities fo fish as well as whales and is an example of the Russian trend toward versatility. This vessel is presumed to be a replacement for the outdated Aleut, a converted ancient carr vessel, which had operated in the area for several years. At the present time it is not clear whether the Vladivostok is a replacement of, or in addition to, the Aleut for the 1963 whaling season. It is reported that at least one more vessel of the same type as Vladivostok is scheduled to join the Soviet Union Far Eastern Fleet at an early date.

The Russian fishery research vessel Vitiaz was reported studying the distributi and migration of fish in the eastern Bering Sea during February. This 2,975-gross ton vessel is the flagship of the oceanographic fleet and is affiliated with the Institute of Oceanology, Academy of Sciences, U. S. S. R. She is unusually well equipped with extensi modern scientific equipment, and carries a staff of 73 scientists.

Increasing research cruises by Russian scientific vessels indicate the intensive int est of the Russians in waters adjacent to Alas and may well forecast even greater expans of their efforts in exploiting the marine re sources in these waters.

Japan: The Akebono Maru No. 51 retur to the Gulf of Alaska early in the month fo second exploratory effort, and is to be follow by the Seiji Maru, Taiyo Maru, and Teny Maru at close intervals. These vessels we dispatched as part of an agreement made a the November meeting of the Internationa North Pacific Fisheries Commission with stipulation that observers from the other Party governments would be aboard. Three men from the Seattle Bureau of Commerci Fisheries Laboratories and a member of t Canada Board of Fisheries will serve as o servers.

The total Japanese factoryship fleet to engage in the bottom fishery in the Bering Sea for 1963 was reported by usually reliable sources to be 19 factoryships and 262 catcher vessels. Many of those had already been dispatched and were on the grounds by the end of April.

Also reported was a fleet of nine catcher vessels which recently sailed from Japan for king crab fishing in Bristol Bay. Five belonged to the Dainichi Maru fleet and 4 to the Tokei Maru fleet; they are reportedly scheduled to operate until the end of November.

The Chichibu Maru accompanied by 12 trawlers and the Chichibu Maru No. 2 accompanied by 6 catcher vessels were fishing in the eastern Bering Sea throughout April. The catcher fleets of Akebono Maru Nos. 1, 2, 5, 3, and 9 were augmented during April.

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PROCESSED SEA LION PUP SKINS MAY HAVE COMMERCIAL VALUE:

A seal-processing company located in British Columbia, Canada, has advised the Alaska Department of Fish and Game that the skins of newborn sea lion pups appear to have a market value of $6 or perhaps more. This resulted from the experimental processing of a sea lion pup skin which was furnished by the Department. The skin was processed in Europe by methods normally used for hair seal skins.

The present population of sea lions in Alaska numbers between 150,000 and 200,000 animals according to the Commissioner of the Department. The evidence of commercial value for these suggests that Alaska's sea lion resource may be developed into a new, though limited, industry. The Commissioner pointed out that sea lions give birth to their pups during the month of June and that the skins of pups would have to be harvested during that time.

California

MIDWATER TRAWLING FOR SALMON FINGERLINGS RESUMED:

M/V "Nautilus" Cruise 63N-Salmon (January 13, February 10, and March 10-11, 1963): The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued in the San Francisco Bay area to collect juvenile king salmon for scale development analysis, and to obtain data concerning the life history of king salmon in the area. A nylon midwater trawl with a 25-foot square opening was used.

M/V Nautilus Cruise 63N-Salmon (January 13, February 10, and March 10-11, 1963).

Only 1 king salmon (Oncorhynchus tshawytscha) was found in the catch from the 24 surface tows of 20 minutes duration which were completed. The salmon was not marked.

Other species appearing in the catch consisted mostly of Pacific herring (Clupea pallasi)--2,730 fish, jack smelt (Atherinopsis californiensis)--272 fish, and northern anchovy (Engraulis mordax)--122 fish.

Note: See Commercial Fisheries Review, November 1962 p. 21.

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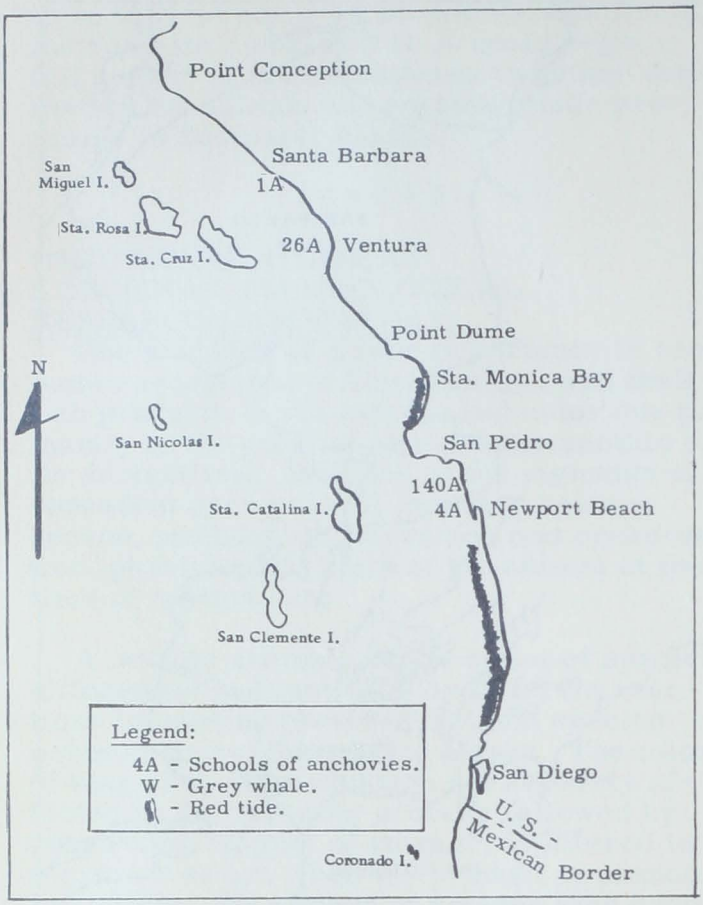
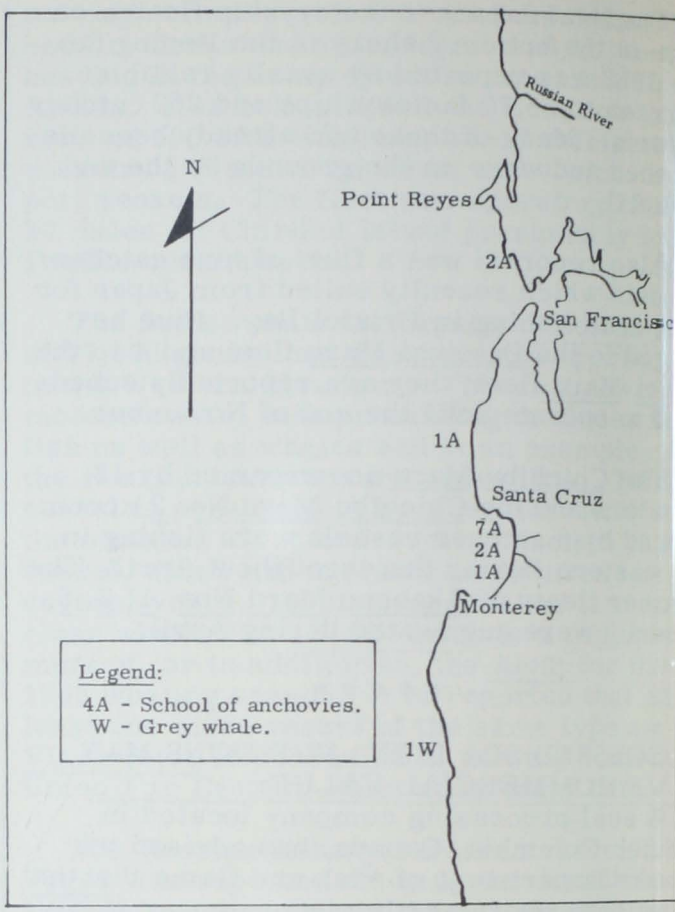
PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 63-4-Pelagic Fish (April 22, 23, and 24, 1963): To determine





Airplane Spotting Flight 63-4-Pelagic Fish (April 22, 23, and 24, 1963).

the inshore distribution and abundance of pelagic schools and to survey the extent of red tide along the southern California coastline, the area from the United States-Mexican Border to Point Arena was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

Weather conditions were excellent during the first 2 days of the survey when visibility exceeded 40 miles except in the Santa Monica and San Pedro harbor areas, where ground haze prevailed. But on the last day, low clouds and fog hampered visibility between Point Dume and Ventura and from west of Gaviota to Point Conception.

Anchovies were spotted in the San Francisco, Monterey Bay, Ventura, Los Angeles harbor, and Newport Beach areas. A total of 184 anchovy schools comprising nine school groups were seen. One California grey whale was sighted off Point Lopez. Red tide had diminished greatly since March 1963. It was still quite extensive in Santa Monica Bay, but had disappeared from the area between Point Vicente and Newport Beach. South of Newport Beach, red tide occurred a mile or so offshore to La Jolla, but most of the inshore area was clear.

Along the northern California coast, rive were discharging a great deal of suspended soil and discoloring the inshore waters. In these areas, water clarity was poor, makin it difficult to spot fish schools. The Morro Bay area was checked on successive days, but both times the water was turbid and no schools were seen.

In numbers of fish schools seen, the flig was the most productive made in January-April 1963.

Note: See Commercial Fisheries Review, May 1963 p. 19.

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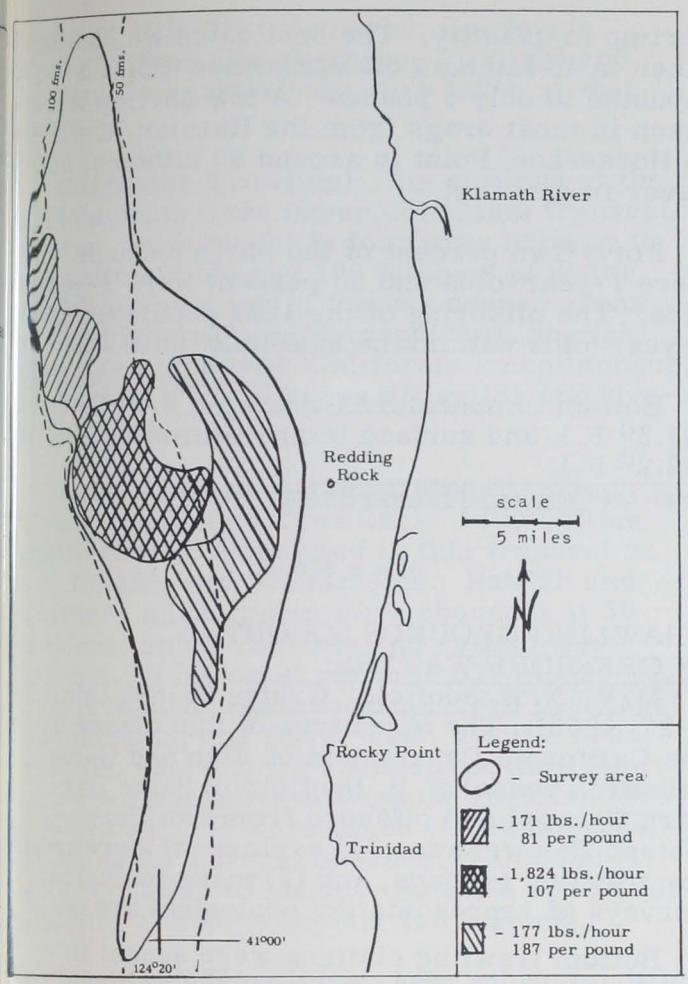
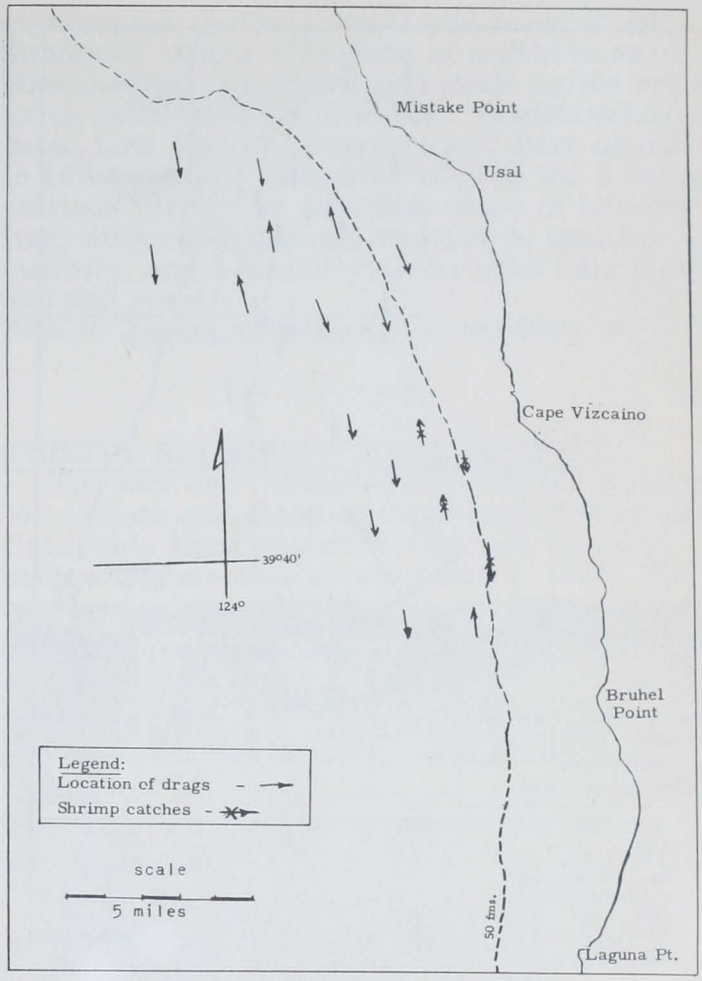
SHRIMP RESOURCES IN NORTHERN AND CENTRAL COASTAL WATERS SURVEYED

M/V "Alaska" Cruise 63-A-2 (March 22 April 24, 1963): The main objectives of thi cruise by the California Department of Fish and Game research vessel Alaska off north



M/V Alaska Cruise 63-A-2, Area A.



M/V Alaska Cruise 63-A-2, Area B-1.

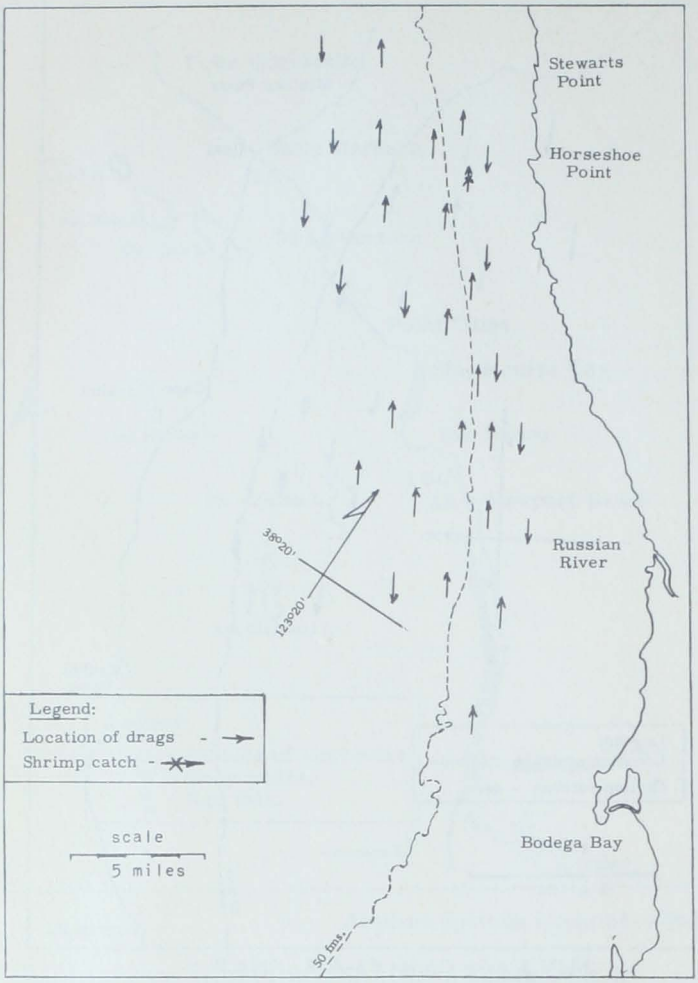
and central California from about Crescent City to Bodega Bay were to: (1) locate concentrations of pink shrimp (Pandalus jordani) for population estimates in Areas A, B-1, and B-2 (see charts); (2) determine sizes, sex ratios, and weights of shrimp in each area; (3) make bathythermograph and Nansen bottle casts for bottom temperatures and water samples in productive shrimp areas; and (4) count and weigh incidentally caught fish. Bad weather during the cruise limited some of the planned activities.

AREA A: A total of 48 tows with a 41-foot head rope Gulf otter trawl was made from the Klamath River to Trinidad Head in 30 to 105 fathoms of water. Shrimp were concentrated in a 47-square-mile area between Big Lagoon and the Klamath River in 40-100 fathom depth. In that area, the shrimp population was estimated at 4,240,000 pounds. Even considering sampling error (the estimate was based on the yield from 16 tows) the population was expected to comprise between 3,500,000 to 5,000,000 pounds. Shrimp were caught at an average rate of 793 pounds-per-hour, with a range of 75 to 2,400 pounds-per-hour. Heads-on counts ranged from 61 to 199 per pound with an average of 104.

The 1962 year-class was considerably smaller than those of preceding years. As was expected, the 1961 year class was predominant. The 1962 class made up 10 percent of the catch; the 1961 class, 62 percent; and the 1960 class, 28 percent. Most female shrimp had completed spawning and only 16 percent were gravid.

The fish catch was generally light. Slender sole (Lyopsetta exilis), rex sole (Glyptocephalus zachirus), and sand dabs (Citharichthys sordidus) were taken at most stations. The absence of hake (Merluccius productus) from all but four stations was notable.

Bottom water samples were obtained at 16 stations for salinity determinations. A total of 41 bathythermograph casts were made. Bottom temperatures for the area averaged



M/V Alaska Cruise 63-A-2, Area B-2.

9.2° C. (48.6° F.). Surface temperatures averaged 11.1° C. (52.0° F.).

AREA B-1: A total of 18 tows were made from Bruhel Point to Mistake Point in 40 to 90 fathoms without locating shrimp in commercial quantities. The only shrimp concentration found was off Cape Vizcaino in 57 fathoms. The best tow in that area yielded barely 100 pounds-per-hour.

Heads-on counts ranged from 246 to 108 per pound, averaging 140. About 45 percent of the catch consisted of 1-year-old shrimp; the remainder was made up of 2-year-olds. This year's school is smaller than that found in 1962, which also was not of commercial size.

Bottom temperatures averaged 8.2° C. (46.8° F.) and surface temperatures 11.8° C. (53.2° F.).

AREA B-2: Thirty 20-minute tows in the area between Bodega Head and Stewarts Point in 41 to 75 fathoms failed to locate shrimp in quantity. The best catch which was taken in 48 fathoms off Horseshoe Point amounted to only 6 pounds. A few shrimp were taken in most drags from the Russian River to Horseshoe Point in around 50 fathoms, but never in quantity.

Forty-two percent of the shrimp caught were 1-year-olds and 58 percent were 2-year olds. The offspring of the 1962 population of 1-year-olds will not be available until 1964.

Bottom temperatures averaged 8.6° C. (47.5° F.), and surface temperatures 11.2° C. (52.2° F.).

Note: See Commercial Fisheries Review, May 1963 p. 20.

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TRAWLING GROUNDS SOUGHT IN OFFSHORE WATERS:

M/V "N. B. Scofield" Cruise 63-S-2 (March 8-27, 1963): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in Santa Barbara Channel and offshore from San Luis Obispo Bay were to: (1) explore offshore area for trawling grounds, and (2) make biological surveys of representative ecological areas.

Bottom trawling stations were sought in depths of 20, 50, 100, 250, and 500 fathoms. Midwater trawling was also planned at each stations. All tows were for 30 minutes. During the cruise, fish and invertebrates were identified, enumerated, and measured. Samples of unidentified or unusual specimens were saved for scientists.

SANTA BARBARA CHANNEL: In this area trawling stations were located on the following two transects:

Gaviota to Santa Rosa Island Transect (Bottom Trawling): Eight bottom stations were occupied at depths of about 50, 100, 230, and 300 fathoms. At the 50-fathom depth, Pacific sanddabs (Citharichthys sordidus), English sole (Parophrys vetulus), ratfish (Hydrolagus colliei), and northern midshipmen (Porichthys notatus) were most abundant. Small stripe-tail rockfish (Sebastodes saxicola), a small splitnose rockfish (Sebastodes diploproa), Pacific hake (Merluccius productus), and a slender sole (Lyopsetta exilis) were taken at 100 fathoms. Dover sole (Microstomus pacificus), Pacific hake, filetail cat shark (Parmaturus xaniurus), and rattails (Coryphaenoididae) were caught in the 230-fathom tow. Extremely soft mud was found at 310 fathoms

however, filetail cat sharks, California smoothtongue (Leuroglossus stilbius) and unidentified gastropods were taken at that depth.

(Midwater Trawling): Six stations at the middle depth were occupied on this transect. No fish were caught in four tows halfway to the bottom in 50 and 100 fathoms of water. Midwater trawling in the two deeper areas yielded lanternfish (Myctophidae), dogfish (Squalus acanthias), California smoothtongue, ribbonfish (Trachipterus altivelis), and juvenile rockfish.

Point Conception to San Miguel Island Transect (Bottom Trawling): Five bottom stations were completed in this transect at 50, 70, 120, and 250 fathoms. Ratfish and northern midshipmen were abundant at 50 fathoms; small rockfish and ratfish were taken at 70 fathoms; rex sole (Glyptocephalus zachirus) and small rockfish were present at 120 fathoms; and Dover sole, Pacific hake, rattails, shortspined channel rockfish (Sebastodes alascanus), and aurora rockfish (Sebastodes aurora) were taken at 250 fathoms. Scouting for several hours with an echosounder failed to indicate suitable bottom for trawling at depths beyond 250 fathoms.

(Midwater Trawling): Five midwater hauls were made at approximately the same locations as the bottom-trawl stations. Postlarval Pacific sanddabs, speckled sanddabs (Citharichthys stigmaeus), and Dover sole were taken in quantity in the midwater tows in 50 and 100 fathoms of water. At the deeper levels lanternfish and argentinids predominated in the midwater catch.

SAN LUIS OBISPO BAY (Bottom Trawling): Five bottom tows were made in this area at depths of 20, 50, 230 and 300 fathoms. Sand sole (Psettichthys melanostictus) and English sole predominated in the catch at 20 fathoms; Pacific sanddabs, stripetail rockfish and northern midshipmen were abundant at 50 fathoms; dogfish, stripetail rockfish and splitnose rockfish were taken at 100 fathoms; and Dover sole, shortspine channel rockfish and sablefish were abundant at both 230 and 300 fathoms. Considerable good trawling bottom was found at 300 fathoms, but shallower levels lying as a ridge farther offshore were rough. More exploratory work needs to be done in this area.

(Midwater Trawling): Four midwater tows were made to coincide with the deeper bottom stations (no midwater haul was made at 20 fathoms). About 10 pounds of northern anchovies (Engraulis mordax) made up the entire catch in 50 fathoms of water. Postlarval sanddabs, both Pacific and speckled, were abundant in 100 fathoms. Midwater tows at the 2 deeper stations yielded an abundant catch of lanternfish, other bathypelagic species in smaller quantity, and 3 female Pacific hake (one ripe and two spent).

Note: See Commercial Fisheries Review, May 1963 p. 23.

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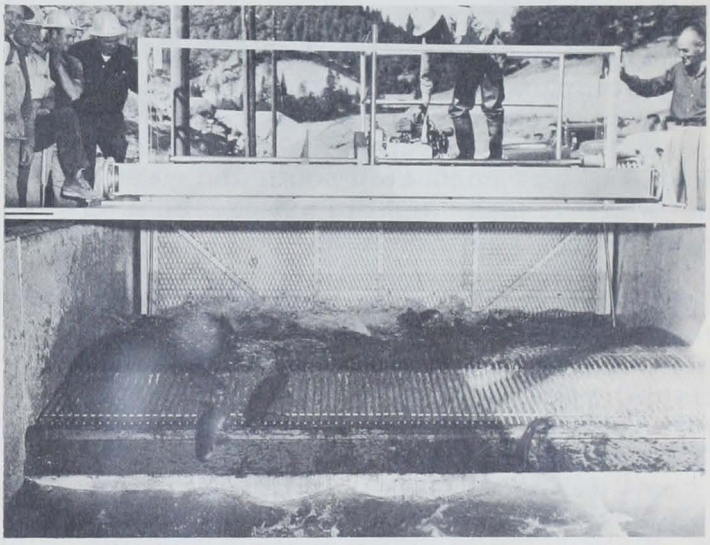
TRINITY RIVER HATCHERY OPENED:

The new and modern Trinity River Hatchery for salmon and steelhead was accepted by the California Department of Fish and Game at dedication ceremonies on June 15, 1963. The

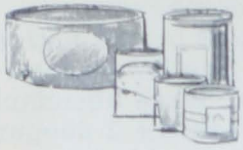


Scene at Lewiston Dam Fish Facilities as the salmon rise from the fish sweep and come over the waterfall into a special tank.

hatchery was built by the U. S. Bureau of Reclamation in order to compensate for the loss of the spawning areas which were cut off by the construction of Trinity and Lewiston Dams. The U. S. Bureau of Reclamation will also provide funds to operate the new California hatchery. (News Release, California Department of Fish and Game.)

Cans--Shipments for Fishery Products, January-March 1963

A total of 558,588 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-March 1963, a decline of 4.7 percent



from the 586,196 base boxes used during the same period in 1962. Most of the decline was due to a smaller pack of tuna in the first part of 1963.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.

Central Pacific Fisheries Investigations

TUNA STUDIES:

M/V "Charles H. Gilbert" Cruise 65 (April 17-23 and May 6-20, 1963): This multipurpose cruise by the Charles H. Gilbert, research vessel of the U.S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, was conducted south and west of the Island of Oahu and did not exceed a 45-mile radius from Honolulu.

One of the main objectives of the cruise was to compare the feeding behavior of skipjack when (1) two different species (nehu and tilapia) were used as bait and (2) surface water sprays were used with tilapia as bait. The experiment alternating nehu and tilapia as bait was tried on four different schools of skipjack. None of the skipjack schools were "fast-biting" in their response to the live bait. The results were preserved on movie film and on an event recorder for further analysis.

In other phases of the cruise, 221 blood samples were collected from 6 schools of skipjack for use in subpopulation studies. A total of 69 live tuna (55 skipjack, 7 yellowfin, and 7 little tunny) were captured and delivered ashore for behavior experiments. In addition, methods of using the stern bait tank for transporting live tuna were tested in an attempt to reduce operational costs. Tuna were placed in the stern bait tank on three occasions. Survival from the fishing site to the dock was 93 percent. But problems arose in transferring the fish to the shore holding pools. It seems that the best way to make the transfer is to dipnet the fish out of the bait tank into a transfer tank which can then be immersed in the holding pool to release the fish.

The watch for bird flocks resulted in 39 sightings of which 11 were associated with skipjack schools, 2 with skipjack-yellowfin schools, and 1 with a skipjack-yellowfin-little tunny school. It was not possible to identify the species of fish in the other schools associated with the bird flocks.

The first gill arches of three dolphin (Coryphaena hippurus) were frozen for the behavior program.

The thermograph and barograph were operated continuously whenever the ship was at sea.

Note: See Commercial Fisheries Review, February 1963 p. 22.

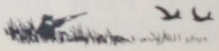
Federal Aid for Sport Fish and Wildlife Restoration

INTERIOR APPORTIONS FUNDS TO STATES:

A preliminary distribution of $12,600,000 in Federal-aid funds was made available to the States July 1, 1963, for fish and wildlife restoration projects, Secretary of the Interior Stewart L. Udall announced on May 23. The Secretary said that early distribution was made again this year so as to help the States in better programming of their Federal-aid activities. The balance of the Federal-aid funds will be apportioned during the fall of 1963. For the past five years, wildlife restoration funds have averaged $14.8 million annually and fish restoration funds approximately $5.3 million each year.

Of the $12,600,000 allocated so far this year, $10,200,000 is for wildlife restoration and $2,400,000 for fish projects. Under the Federal-aid programs for restoring fish and wildlife, the States spend their own funds on approved projects and are then reimbursed up to 75 percent of the cost.

Federal-aid funds come from an excise tax on sporting arms and ammunition and on fishing rods, reels, creels, and artificial lures. Distribution of the two funds is made on formulas based upon the number of paid license holders in a State and on the State area, as prescribed by law. The Federal Fish and Wildlife Restoration programs are administered by the Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service.



Great Lakes Fisheries Exploration and Gear Research

EXPLORATORY FISHING IN LAKE ERIE:

The U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel Kaho departed Saugatuck, Mich., May 7, 1963, on a cruise to conduct exploratory fishing operations in the United States waters of Lake Erie. The vessel was also scheduled to carry out environmental studies in Lake Erie in cooperation with the Public Health Service of the U. S. Department of Health, Education, and Welfare.

The Bureau's exploratory fishing and gear research vessel, Kaho.

The primary purpose of the cruise was to extend seasonal knowledge regarding the geographic location, bathymetric distribution, relative abundance, and availability of various species of fish to standard otter-trawl fishing gear.

Echo-sounding equipment was to be used to survey bottom conditions and record fish concentrations. Bathythermograph casts and bottom samples were to be taken at each fishing station. The Kaho carried a 52-foot (headrope) Gulf of Mexico-type otter trawl to assess the commercial trawling potential at standard stations. The crew of the Kaho also planned to test a 61-foot (headrope) No. 35 Yankee trawl (top half constructed of polypropylene) for its effectiveness in Lake Erie. Mesh-size selectivity tests on trawl nets were to be continued in areas of yellow perch concentration.

Great Lakes Fishery Investigations

LAKE MICHIGAN FISH POPULATION SURVEY:

M/V "Cisco" Cruise 2 (April 30-May 14, 1963): To study fish distribution in southeastern Lake Michigan prior to thermal stratification was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Operations were conducted off Saugatuck and Holland, Mich. At the beginning of the cruise, the surface water temperature near shore ranged up to 8° C. (46.4° F.). Surface water became steadily colder as the distance from shore increase and at distances more than 5 miles offshore was mostly about 2° C. (35.6° F.). Bathythermograph tracings showed slight temperature inversions in some areas. By the end of the cruise, surface water temperatures were 1° to 2° C. (1.8° to 3.6° F.) warmer, but thermal stratification was still not pronounced.

Standard tows (10-minute drags of a $\frac{3}{4}$-size North Atlantic whiting trawl with a $\frac{1}{2}$-inch mesh cod end) were made at 5-fathom interval from 5 to 50 fathoms and at 7 and 12 fathoms. From 2 to 7 tows were made at each depth except 45 and 50 fathoms, where single tows were made. No especially large catches were made. A brief summary of the distribution of the species of fish taken follows:

Bloaters--none shallower than 10 fathoms, few under 20 fathoms; fairly even distribution from 20 to 50 fathoms. The size distribution was similar at different depths, except for a somewhat larger percentage of very large bloaters at 20 and 25 fathoms. Catches at depths less than 30 fathoms were larger near the end of the cruise than at the beginning.

Chubs (Coregonus reighardi, C. alpenae, C. zenithicus, and C. kiyi)--too few caught to indicate distribution.

Lake herring--apparently uniformly distributed between 5 and 45 fathoms, but average catch only about 2 per tow.

Yellow perch--mostly between 5 and 15 fathoms, but a few (1 to 3) in almost every deeper tow out to 45 fathoms. The largest catch was made at 12 fathoms.

Alewives--taken at all depths sampled, but generally more abundant in shallower water. They were moving into shallower water as the cruise progressed, and large numbers were found at the mouth of the Kalamazoo River.

Smelt--caught at all depths between 5 and 35 fathoms, but were more common at depths shallower than 20 fathoms.

Spottail shiners--taken at all shallow depths up to 20 fathoms, but the largest concentrations were at 12 fathoms.

Slimy sculpins--at all depths, but abundant only between 20 and 45 fathoms.

Deepwater sculpins--mostly at 45 and 50 fathoms, although a few as shallow as 20 fathoms.

Other species--small numbers of trout-perch were caught at 5 to 20 fathoms. A 5.4-inch lake trout was caught at 7 fathoms, and another (10.5 inches long) was taken at 15 fathoms. Both were believed to have been planted in 1962. A total of 5 whitefish were caught between 10 and 15 fathoms; 3 were only about 9 inches long, but 2 were mature. The most unusual catch was a northern creek chub at 25 fathoms.

Blood, eye lenses, and muscle tissue were collected from many of the livelier chubs in the trawl samples for use in electrophoretic and serological studies designed to develop methods to aid in the identification of the various chub species.

Half-meter and meter plankton nets of rather large mesh were towed for fish fry at various levels between surface and bottom where water depth ranged from 5 to 50 fathoms. Tentative identification indicated that few fry other than deepwater sculpins were caught. Those fry (not common at any depth) were scattered at all levels over bottoms of 15 to 50 fathoms, but were somewhat more numerous over bottoms of 40 to 50 fathoms than at other depths. Several deepwater amphipods (Pontoporeia affinis) and a few opossum shrimp (Mysis relicta)--some of the latter extremely small--were taken well off the bottom in bright daylight, in water deeper than 20 fathoms.

During Cruise I (April 9-23, 1963), the Cisco carried out current studies in southern Lake Michigan, under contract to the U. S. Public Health Service.

* * * * *

SEA LAMPREY CONTROL IN LAKE MICHIGAN AND LAKE SUPERIOR:

A total of 1,530 spawning sea lampreys h been taken by May 17, 1963, at the 26 electr cal barriers on United States streams of Lake Superior--a decline of 27 percent fro

Electromechanical sea lamprey control device.

the count at the same barriers on the comparable date of the previous year. During the past 6 years, from 16 to 41 percent of t annual Lake Superior lamprey escapement was recorded by late May.

The lamprey count at the 3 electrical ba riers on Lake Michigan streams was 3,207 as of May 17. That number represents a 3 percent drop from the count during the com parable period in 1961.

Gulf Exploratory Fishery Program

MOTION PICTURE STUDY OF DEEP-WATER SHRIMP BEHAVIOR:

A study on the behavior of deep-water royal-red shrimp as it may bear on their capture by commercial trawling gear was

started in the Gulf of Mexico on May 15, 1963, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. The primary tool used in the study was an underwater motion picture camera system designed at the Bureau's Exploratory Fishing and Gear Research Base, Pascagoula, Miss. The camera and its lights were fitted to the headrope of a conventional shrimp trawl.

The cruise was expected to help answer questions such as: (1) Do the royal-red shrimp burrow much of the time or are they free-swimming above the bottom? (2) Are the shrimp more-or-less evenly distributed on known grounds or concentrated in "pockets"? (3) Can the deep-water shrimp escape fishing trawls more readily than their shallow-water counterparts?

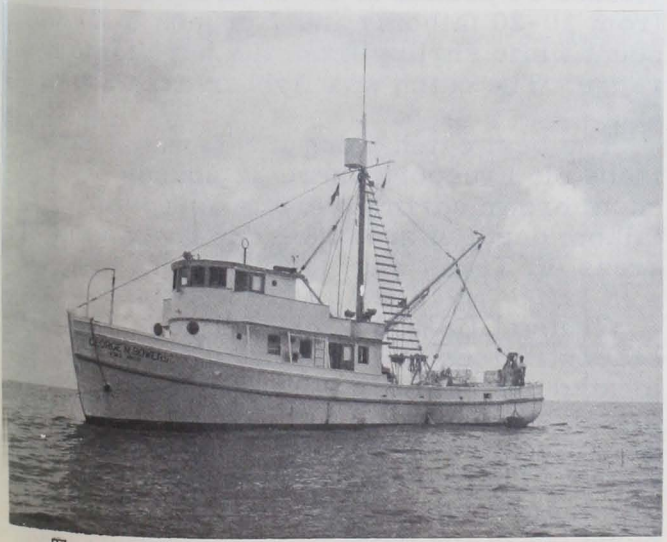
Incentive for the study came primarily from observations of large balls of shrimp antennae in trawls containing few shrimp--an indication that conventional trawls were not effective.

The study took place on grounds off the Mississippi Delta in 200-250 fathoms. The availability of shrimp on those grounds was first discovered in the early 1950's.

* * * * *

SHRIMP GEAR STUDIES:

M/V "George M. Bowers" Cruise 43 (January 9-24, 1963), Cruise 44 (February 5-22, 1963), and Cruise 45 (March 25-May 16, 1963): The objectives of these cruises by the U. S. Bureau of Commercial Fisheries gear research vessel George M. Bowers were to: (1) field test instruments developed for shrimp-trawl mechanics studies, (2) initiate mechanical studies of standard shrimp trawls, and (3) conduct a preliminary mechanical evaluation of an experimental shrimp-trawl door design. The George M. Bowers operates from the Gulf and South Atlantic Exploration and Gear Research base at Pascagoula, Miss.



The Bureau's gear research vessel, George M. Bowers.

INSTRUMENTATION: The new measuring devices used included: (1) a sonic distance measuring system employing a wire link between gear and vessel, (2) a bottom-speed indicator, also with wire telemetry, and (3) an angle indicator which records, at the door, the angle of attack and door-leg angle.

The sonic distance measuring system utilizes transducers mounted immediately behind each trawl door to meaure spread and a pair of transducers mounted adjacent to each other at the center of the headrope to measure vertical opening. The sonic signals between transducers are read as time differences on an oscilloscope.

The bottom-speed indicator is a cogged wheel, 24 inches in circumference. Two magnets, mounted on the wheel, activate a switch adjacent to the wheel. The electrical pulses produced are recorded aboard the vessel as a function of time (feet per minute). The unit is secured to the door in a manner that permits it to track in the towing direction, and remain unaffected by door tilt. It serves also as an on-bottom indicator.

Performance of the underwater units and telemetry cable at the trawl was observed directly by SCUBA divers. Observations showed that the instrumentation was not affecting the normal performance of the gear.

GEAR: For the initial tests a 40-foot flat net and 150-pound trawl doors (6 feet by 38 inches) were used. The gear was fished with a single cable and a 20-fathom bridle.

MEASUREMENT DATA: Measurements were obtained using 3 scope ratios (5:1, 10:1 and 15:1) and 3 towing speeds (2.0, 3.0 and 4.0 knots). Those were water speeds measured at the vessel. To minimize the effect of water currents, measurements of each variable were made in opposite directions. All work was conducted off Panama City Beach, Fla., in a depth of 5 fathoms.

The results were as follows:

1. The spread of the gear varied from average of 20 feet to 29.1 feet.

2. The vertical opening ranged from 4 feet to 7 feet and was inversely related to horizontal spread, i.e., as horizontal spread increased, the vertical opening decreased.

3. Total towing load, measured aboard the vessel, ranged from averages of 812 pounds at $1\frac{1}{2}$ knots (ground speed) to 1,816 pounds at 2.5 knots.

4. Abnormal current conditions were occasionally encountered where ground speed was greatly reduced (to 0.5 knot) although water speed measured at the vessel was normal (2.0 knots). Under those conditions, the horizontal spread was reduced to less than 15 feet, the vertical opening increased to $9\frac{1}{4}$ feet, and the total load was reduced to 382 pounds. Data obtained under such conditions were not used in computing the averages reported above.

Acquisition of mechanics data on standard shrimp trawling gear will continue through the summer of 1963.

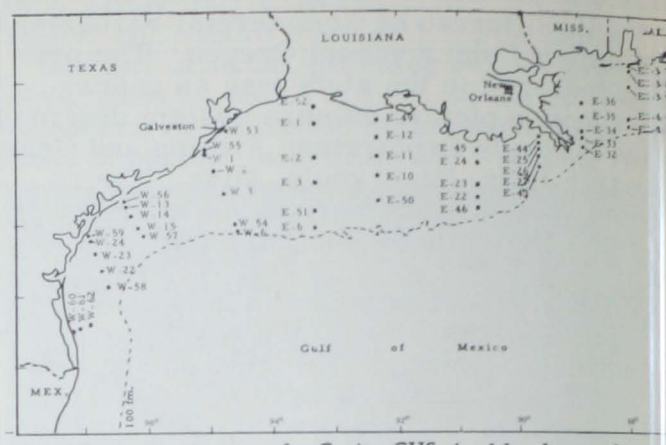
EXPERIMENTAL TRAWL DOORS: Preliminary trials were conducted with a pair of experimental V-design shrimp trawl doors to determine optimum towing point and flotation-ballast balance. It has been claimed that the V-design results in (1) greater spreading-drag force ratio, (2) greater stability in setting and towing, and (3) smaller scope ratio requirements. Upon construction of a prototype production model, experiments will be conducted to determine mechanical performance as compared to standard flat doors.

Note: See Commercial Fisheries Review, December 1962 p. 33

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-4 (April 21-May 7, 1963): Catches ranged from poor to only fair during this cruise off the coast of Alabama, Mississippi, Louisiana, and Texas by the chartered vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing stu of the distribution of shrimp in the Gulf of Mexico.



Shows the station pattern for Cruise GUS-4 of the chartered rese vessel Gus III, April 21-May 7, 1963.

Nine statistical areas (10, 11, 13, 14, 16 17, 18, 19, and 20) were covered. One 3-ho tow with a 45-foot shrimp trawl was made i each of 3 depth ranges (0-10, 10-20, and ov 20 fathoms) in all areas, with brown shrim predominating in the catch from most areas White shrimp were scattered and the catch pink shrimp was very light.

Tows off Alabama and Mississippi yielde insignificant results except in the over 20-fathom depth of area 11 where 18 pounds of 15-20 count brown shrimp were taken.

The best catches off the Louisiana coast consisted of 14 pounds of 15-20 count brow shrimp from over 20 fathoms in area 13, a 14 pounds of 21-25 count white shrimp fro the 0-10 fathom range in area 14. Area 16 yielded 10 pounds of 15-20 count brown shr from 10-20 fathoms and 7 pounds of 21-25 count white shrimp from the 0-10 fathom range. The catch was light in area 17.

The best catch along the Texas coast wa made off Freeport where 22 pounds of 31-4 count brown shrimp were taken in the 10-2 fathom depth of area 18. The catch in othe areas off Texas was light.

Cruise GUS-5 (May 13-22, 1963): No la concentrations of commercial shrimp were located during this cruise by the Gus III, al though catches of large brown shrimp were better at 20 fathoms than in the previous month. There were indications that small brown and white shrimp were beginning to move out of the bays.

A total of 7 statistical areas (13, 14, 16, 17, 18, 19, and 20) were covered, although 8 stations in the western transects were not fished because of lost trawling gear. At all other stations, one 3-hour tow with a 45-foot shrimp trawl was made. Depths of 0-10, 10-20, and over 20 fathoms were sampled.

Area 14 was the most productive, yielding 19 pounds of 15-20 count brown shrimp from over 20 fathoms, 12 pounds of 15-20 count brown shrimp from the 10-20 fathom depth, and 5 pounds of over 68 count brown shrimp from the 0-10 fathom range.

In area 18, a catch of 18 pounds of 21-25 count brown shrimp was taken in 10-20 fathoms, and 10 pounds of 21-25 count white shrimp were caught in the 0-10 fathom depth.

Catches in other areas were light and consisted mainly of large brown shrimp, although area 17 yielded 10 pounds of over 68 count white shrimp from under 10 fathoms.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, June 1963 p. 31.

Industrial Fishery Products

U.S. FISH MEAL AND SOLUBLES:

Production and Imports, January-March 1963: Based on domestic production and imports, the United States available supply of fish meal for January-March 1963 amounted to 114,276 short tons--40,700 tons (or 55.3 percent) more than during the same period in 1962. Domestic production was 3,002 tons (or 27.8 percent) less, but imports were 43,702 tons (or 69.6 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 87,751 tons.

U. S. Supply of Fish Meal and Solubles, January-March 1963 with Comparisons

Item	Jan.-Mar. 1/1963	Jan.-Mar. 1962	Total 1962
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	-	207	238,680
Tuna and mackerel	5,739	6,524	26,559
Herring	2/	249	5,095
Other	2,061	3,822	27,999
Total production	7,800	10,802	298,333
Imports:			
Canada	9,454	9,831	42,806
Peru	87,751	49,082	186,249
Chile	6,835	1,157	9,247
Norway	331	-	1,599
So. Africa Republic	1,450	2,603	10,084
Other countries	655	101	2,322
Total imports	106,476	62,774	252,307

(Table continued on next column)

Item	Jan.-Mar. 1/1963	Jan.-Mar. 1962	Total 1962
	(Short Tons)		
Available fish meal supply	114,276	73,576	550,640
Fish Solubles:			
Domestic production 3/	4,479	5,671	124,334
Imports:			
Canada	563	492	1,335
Iceland	-	2,205	2,332
So. Africa Republic	-	-	1,717
Other countries	897	133	924
Total imports	1,460	2,830	6,308
Available fish solubles supply	5,939	8,501	130,642

1/Preliminary.
2/Included with "other."
3/50-percent solids. Includes production of homogenized condensed fish.

The United States supply of fish solubles (including homogenized fish) during January-March 1963 amounted to 5,939 tons--a decrease of 2,562 tons as compared with the same period in 1962. Domestic production and imports dropped 21.0 percent and 48.4 percent, respectively.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, March 1963: During March 1963, a total of 2,668 tons of fish meal and scrap and 412,000 pounds of marine-animal oils was produced in the United States. Compared with March 1962, this was a decrease of 1,577 tons or 37 percent in meal and scrap production, and a decrease of 25,000 pounds or 6 percent in oil.

Tuna and mackerel meal (1,809 tons) accounted for 68 percent of the March 1963 meal and scrap production--a decrease of 787 tons. Oil from tuna and mackerel (337,000 pounds) comprised 82 percent of the March 1963 oil production.

A total of 1,490 tons of fish solubles was produced in March 1963--a decrease of 547

Table 1 - U.S. Production of Fish Meal, Oil, and Solubles, March 1963 1/ with Comparisons

Product	Mar. 1/1963	Mar. 1962	Jan.-Mar. 1/1963	Jan.-Mar. 1962	Total 1962
	(Short Tons)				
Fish Meal and Scrap:					
Herring	-	98	2/	249	5,095
Menhaden 3/	-	-	-	207	238,680
Sardine, Pacific	-	-	9	648	702
Tuna and mackerel	1,809	2,596	5,739	6,524	26,559
Unclassified	859	1,551	2,052	3,174	27,297
Total	2,668	4,245	7,800	10,802	298,333
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	12,899
Grand total meal and scrap	4/	4/	4/	4/	311,232
Fish solubles	1,490	2,037	4,179	5,486	113,238
Homogenized condensed fish	250	100	300	185	11,096
	(1,000 Pounds)				
Oil, body:					
Herring	-	8	2/	54	5,255
Menhaden 3/	-	-	-	194	237,815
Sardine, Pacific	-	-	-	148	167
Tuna and mackerel	337	335	881	909	5,175
Other (including whale)	75	94	287	303	7,396
Total oil	412	437	1,168	1,608	255,808

1/Preliminary data.
2/Included in "other" or "unclassified."
3/Includes a small quantity of thread herring.
4/Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

tons or 27 percent as compared with March 1962. The production of homogenized condensed fish amounted to 250 tons--an increase of 150 tons.

* * * * *

Production, April 1963: During April 1963, a total of 6,589,000 pounds of marine-animal oils and 8,102 tons of fish meal and scrap was produced in the United States. Compared with April 1962, this was an increase of 945,000 pounds or 17 percent in oil, and a decrease of 1,257 tons or 13 percent in meal and scrap production.

Menhaden oil, amounting to 5,832,000 pounds, accounted for 89 percent of the April 1963 oil production. Compared with April 1962, this was an increase of 1,510,000 pounds. Menhaden meal, amounting to 4,991 tons, accounted for 61 percent of the April meal production--an increase of 933 tons, compared with the same month last year.

A total of 2,839 tons of fish solubles was produced in April 1963--a decrease of 416 tons or 13 percent as compared with April 1962. The production of homogenized condensed fish amounted to 950 tons--a decrease of 100 tons as compared with April 1962.

The quantity of fish meal processed during the first 4 months of 1963 amounted to 15,902 tons--4,259 tons less than the same period of the previous year. Marine-animal oil amounted to 7,757,000 pounds--505,000 pounds greater than the same period of 1962.

Table 1 - U.S. Production of Fish Meal, Oil, and Solubles, April 1963 1/ with Comparisons

Product	Apr.		Jan.-Apr.		Total
	1/1963	1962	1/1963	1962	1962
	(Short Tons)				
Fish Meal and Scrap:					
Herring	-	46	2/	295	5,095
Menhaden 3/	4,991	4,058	4,991	4,265	238,680
Sardine, Pacific	-	-	9	648	702
Tuna and mackerel	1,428	2,771	7,167	9,295	26,559
Unclassified	1,683	2,484	3,735	5,658	27,297
Total	8,102	9,359	15,902	20,161	298,333
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	12,899
Grand total meal and scrap	4/	4/	4/	4/	311,232
Fish solubles:					
Menhaden	1,836	932	1,836	1,020	84,885
Other	1,003	2,323	5,182	7,721	28,353
Total	2,839	3,255	7,018	8,741	113,238
Homogenized condensed fish	950	1,050	1,250	1,235	11,096
	(1,000 Pounds)				
Oil, body:					
Herring	-	-	2/	54	5,255
Menhaden 3/	5,832	4,322	5,832	4,516	237,815
Sardine, Pacific	-	-	-	148	167
Tuna and mackerel	300	451	1,181	1,360	5,175
Other (including whale)	457	871	744	1,174	7,396
Total oil	6,589	5,644	7,757	7,252	255,808

1/ Preliminary data.
2/ Included in "other" or "unclassified."
3/ Includes a small quantity of thread herring.
4/ Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Major Indicators for U. S. Supply, April 1963: United States production of fish meal and fish oil in April 1963 was higher by 28.8 percent and 12.1 percent, respectively, as compared with April 1962. Fish solubles production increased by 32.3 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, April 1963

Item and Period	1963	1962	1961	1960	1959
	(Short Tons)				
Fish Meal:					
Production 1/:					
June	-	58,397	53,162	44,293	52,0
May	-	42,374	32,922	17,194	25,3
April	8,131	6,311	6,179	5,076	6,8
January-March	7,863	7,293	7,545	7,311	7,3
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,3
Jan.-Dec. final tot.	-	310,000	311,265	290,137	306,5
Imports:					
June	-	26,453	19,317	11,178	10,3
May	-	25,269	24,753	9,496	16,3
April	-	26,390	19,060	10,397	18,3
January-March	106,476	62,774	44,333	35,304	59,8
January-December	-	252,307	217,845	131,561	133,9
Fish Solubles:					
Production 3/:					
June	-	24,350	17,821	19,549	29,5
May	-	16,014	12,667	7,191	20,6
April	4,222	3,766	2,539	7,678	7,4
January-March	5,172	5,106	4,926	4,873	5,6
January-December	-	120,063	109,018	106,361	176,9
Jan.-Dec. totals	-	124,334	112,241	98,929	165,3
Imports:					
June	-	872	207	149	9
May	-	265	283	59	4,8
April	-	323	220	134	1,6
January-March	1,460	2,830	509	2,176	2,3
Jan.-Dec. totals	-	6,308	6,739	3,174	26,6
	(1,000 Pounds) 5/				
Fish Oils:					
Production:					
June	-	53,565	48,794	36,207	37,4
May	-	32,186	33,844	13,705	20,1
April	6,688	5,054	3,406	1,925	3,3
January-March	1,168	1,429	1,254	1,264	1,3
Jan.-Dec. prelim. totals 4/	-	257,131	259,400	206,848	189,3
Jan.-Dec. final tot.	-	255,808	266,670	215,861	193,3
Exports:					
June	-	4,922	21,036	14,630	11,7
May	-	6,491	3,192	2,427	10,2
April	-	10,270	7,351	5,711	8,3
January-March	46,922	41,323	36,549	29,053	18,7
Jan.-Dec. totals	-	123,050	122,486	143,659	144,9

1/ Does not include crab meat, shrimp, and misc. meals.
2/ Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.
3/ Includes homogenized fish.
4/ Preliminary data computed from monthly data. Represents over 95 percent of the total production.
5/ Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
Note: Data for 1962 and 1963 are preliminary.

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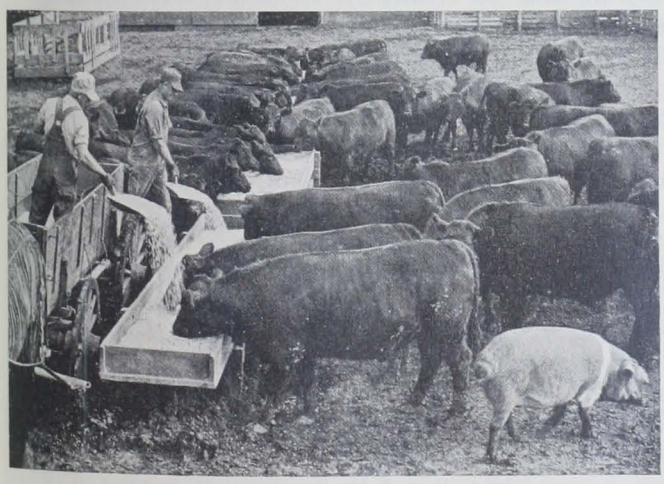
USE OF FISH MEAL AND OIL IN CATTLE RATIONS RECOMMENDED:

Seldom used in cattle rations in the United States, fish meal was for many years an important ingredient of feed fed cattle in some

European countries. During World War II, fish meal was the only protein concentrate available in Norway. In that country, fish meal as a protein source plus wood cellulose as the principal source of energy constituted the accepted ration for cattle during the war years. The results obtained with rations of this kind ordinarily have been considered satisfactory by dairymen. When the proposal was made later to export a large part of the fish meal produced in Norway and to import oil seed meals (peanut, cottonseed, linseed, coconut, and safflower meals) for cattle, the dairymen objected because they were convinced that fish meal is a necessary ingredient of cattle rations. The dairymen's objections were not at all unreasonable in the light of their own experience and some early scientific feeding trials with fish meal. More recently, however, when mixtures scientifically compounded with either fish meal or oil seed meals were compared in feeding trials, the results obtained with mixtures of both types were about equal, provided digestible protein and allowances of energy were equal in both kinds of rations.

Taste panel tests of milk from cows fed rations containing up to 30 percent fish meal revealed no off-flavors in the milk.



Evidence exists that fish oil when fed to cattle, even at relatively high levels, fails to induce off-flavors in the animal products. Butter from cows that each received 2.3 pounds, daily, of cod liver oil meal containing 0.7 pound of oil did not have any distinctly fish flavor, nor was milk quality affected. However, with this relatively large intake of oil the butter produced by the cows was reported to have become soft and oily. The fish oil in the ration is estimated to have been equal to about $2\frac{1}{2}$ percent of the total feed allowances (10 percent moisture). By contrast, most authorities recommend that poultry and swine be fed no more fish oil than the equivalent of 1 percent of the ration including fish oil contained by any fish meal mixed in the ration. Perhaps the most liberal recommendation on record is that not over $1\frac{1}{2}$ percent of the ration for broiler chickens be fish oil. Fish oil in poultry and swine rations is kept at low levels because experience has shown that too liberal fish oil allowances may result in off-flavors in the meat. But it appears that because of the activity of micro-organisms in the first stomach (rumen), of cattle and other ruminants, changes take place in the feed eaten by such animals, and the relation between ingested nutrients and body composition is not as close in cattle as it is in animals with single stomachs such as swine and poultry.

On the basis of the European research, it appears that the value of fish oil in cattle nutrition should be carefully investigated. Fats other than fish oil are now fed to many cattle to add to the palatability of the rations, to supply energy economically, and also, under certain conditions to control loss of chopped feed as a dust and to decrease wear on the chopping machinery. When solid fats are used, such fats must be heated prior to being added to the feed material, but fish oil ordinarily can be used without heating, thus contributing to the economy of the operation. In addition, fish oil prices are fully competitive with fats now being used in rations fed farm animals. The studies suggest that research on feeding fish oil to cattle, in this country, will demonstrate that such oil can be so used to very good advantage. Experiments, already begun in one of the Southern States, have demonstrated that rations containing 2.5, 5, and 7.5 percent menhaden oil are acceptable to calves; such rations have caused no digestive difficulties of any kind. (Technical Advisory Unit, U. S. Bureau of Commercial Fisheries, Boston, Mass.)

Irradiation Preservation

ARCHITECTURAL STUDIES FOR NEW FISHERY PRODUCTS IRRADIATOR BEGUN:

The Atomic Energy Commission has initiated architectural studies on a $600,000 marine products development irradiator to be completed in 1964 near the U. S. Bureau of Commercial Fisheries

Technological Laboratory in Gloucester, Mass.

The irradiator will be used in cooperation with the fishing industry to determine and demonstrate the commercial feasibility of irradiation pasteurization of fresh fishery products at the seacoast for transportation and sale in inland areas. It is planned that fish, in large plastic or metal containers passing through the irradiator at the rate of 1,000 pounds per hour, will be placed in refrigerated trucks and shipped to inland markets.

Upon arrival at a local store the grocer will open the large container and display the high quality fresh fish alongside other fresh foods such as meat and poultry. It is felt that housewives who are normally unable to purchase fresh ocean seafoods will welcome the chance to share these delicacies with their neighbors from coastal areas.

This new preservation technique has been made possible through research which has shown that fresh seafoods with a normal fresh shelf life of 10 to 12 days, can be kept in excellent condition after irradiation pasteurization for more than 30 days. This results from the fact that most of the bacteria which normally spoil fish are inactivated by low levels of irradiation, while no noticeable changes take place in the fish. Species of fish and shellfish which have been studied to date include haddock, flounder, halibut, crabs, clams, and shrimp.

Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SUMMER 1963:

The usual seasonal increase in consumption of fishery products began late in the spring of 1963. But for the current year, consumption is expected to average about the same as in the previous year. Per capita consumption of fishery products during 1962 was estimated at 10.5 pounds, down about 2 percent from 1961.

Supplies of edible fishery products during 1963 will probably be heavier than in 1962. Canned fish stocks are more plentiful this year and cold-storage holdings on April 30, 1963, were higher than in the previous year. Commercial landings, which are already on a seasonal upturn, will reach a peak during June or July. The remainder of 1963 should also see a high level of fishery imports, particularly for shrimp, tuna, canned sardines, and fish blocks.

Lower wholesale prices for certain canned fishery products during the first part of 1963 have now been reflected in retail prices. Maine sardines, pink salmon, and tuna are among the canned items affected. Canned fish prices are expected to remain steady during the summer of 1963.

This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's May 1963 issue of The National Food Situation (NFS-104).

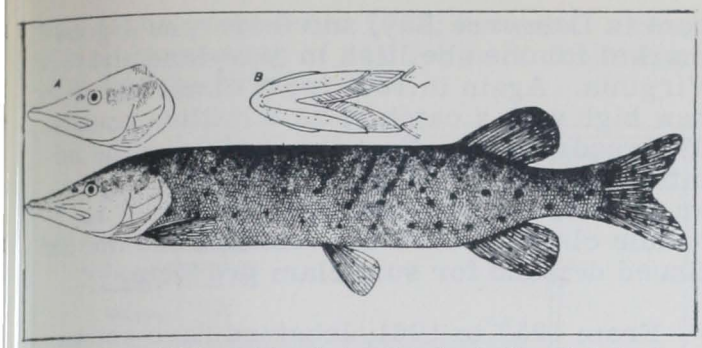
Muskellunge

POPULATION STUDY IN LAKE ST. CLAIR:

Muskellunge is a famous Midwestern game fish. The Conservation Department of Michigan State and the Department of Lands and Forests of Ontario, Canada, are making a survey to learn more about the muskellunge catch in Lake St. Clair, one of the Midwest's top "musky" fishing waters. It is estimated that upwards of 1,000 "muskies" are taken each year from Lake St. Clair's heavily-fished waters. There are no signs that the lake's muskellunge population is going down, but neither has any detailed study been made to indicate whether the jumbo-sized fish are in danger of being overharvested.

Creel-census slips were mailed to 500 members of the Michigan-Ontario Muskellunge Club who are cooperating in the Lake St. Clair catch study which began in May 1963. The club members--mostly owners of private boats who regularly fish the lake for muskies--were asked to record the length and weight of their catches, areas where fish were taken, as well as those where they had no success, and other information.

Guides and boat-rental operators are also assisting in the project. Ontario and Michigan conservation officers, in their routine patrolling, are checking on the percentage of fishermen having creel-census slips to see how much of the lake's total fishing pressure is being covered by the survey.



Muskellunge: (A) lateral head view showing half-scaled cheek and opercle; (B) ventral head view showing 18 branchiostegals on the gill-cover, and 9 sensory pores on each lower jaw.

The census study will last through early fall 1963, and may be resumed during 1964 in an attempt to come up with a better estimate of the annual muskellunge take in Lake St. Clair. Fisheries officials hope to follow through by tagging about 1,000 muskies for additional information.

National Aquarium

AQUARIUM ADVISORY BOARD RECOMMENDS HAINS POINT SITE:

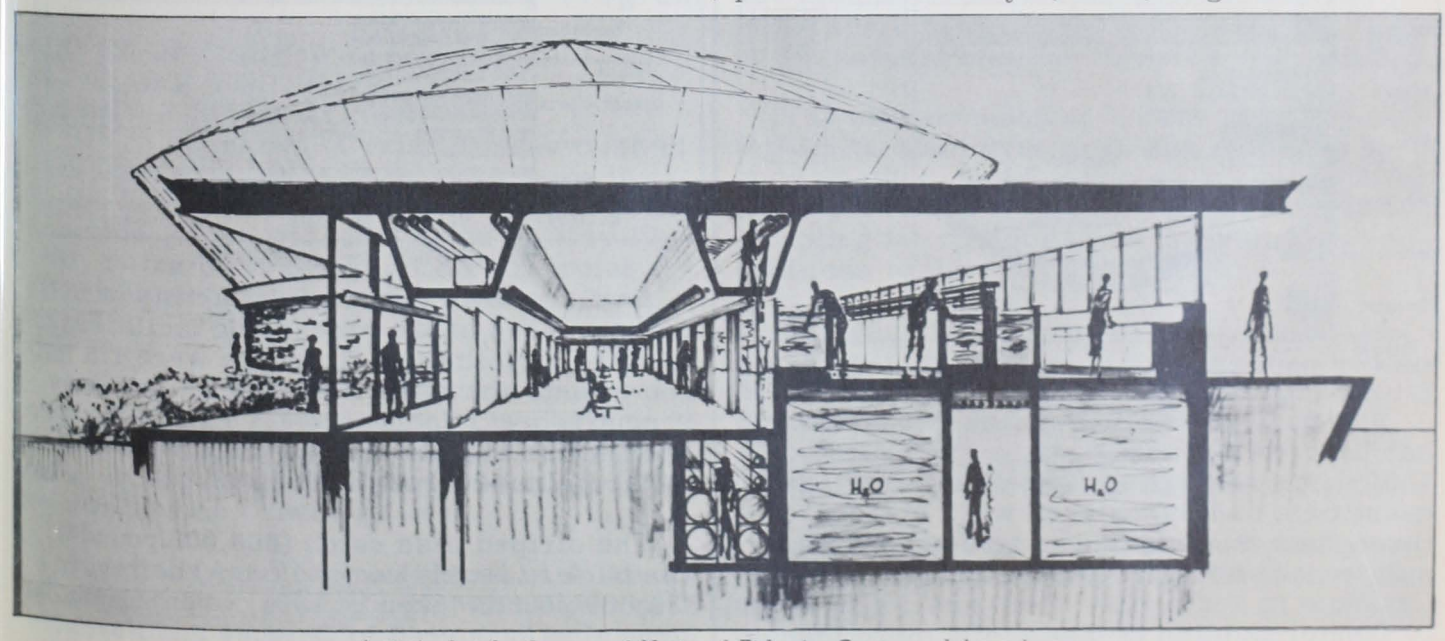
A unanimous recommendation that the National Fisheries Center and Aquarium be located at Hains Point in East Potomac Park, Washington, D. C., has been presented to Secretary Stewart L. Udall, U. S. Department of the Interior. The recommendation was made by the National Fisheries Center and Aquarium Advisory Board during their meeting on April 23, 1963.

At the meeting, Congressman Michael J. Kirwan of Ohio--whom Secretary Udall called "father of the project"--made a brief statement thanking all who helped with the project concluding with: "So we are investing $10 million in the scientific education of the youth of our country. The facility will prove to be one of the best things which has come to Washington in years. It will prove itself from every angle, educational, and recreational. And not only that, every cent the Government will spend on this aquarium will be repaid to the Government."

Secretary Udall who attended the meeting of the Advisory Board emphasized that the new project is "not an aquarium in the same old sense of the word. It will be an institution of science and education to help the people better understand the world of water. It will be an imaginative exhibit which will pay its way and help our understanding expand as the resource needs of the Nation expand. . . ."

The Dean of the Institute of Technology of the University of Minnesota, who is Chairman of the Aquarium Advisory Board, cited four reasons for preferring the Hains Point Site: accessibility to deeper water, better aesthetic surroundings, better off-loading facilities for incoming specimens, and finally that it is far removed from rail and highway traffic vibrations which might adversely affect certain research processes.

The Advisory Board also recommended that a study team be assembled as soon as possible after July 1, 1963, to go into all



Artist's sketch of proposed National Fisheries Center and Aquarium

facets of the design and made some basic recommendations relative to the design.
Note: See Commercial Fisheries Review, March 1963 p. 26.

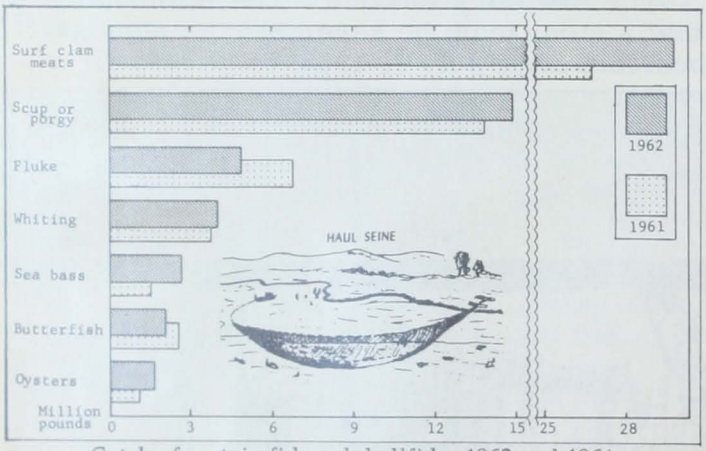
New Jersey

FISHERY LANDINGS, 1962:

Landings of fish and shellfish at New Jersey ports during 1962 totaled 415.7 million pounds with a value of $11.6 million. Compared with 1961, this was an increase of 5 percent in volume and value. The catch for industrial use was up 16.9 million pounds, and that for food increased 2.1 million pounds.

Landings of menhaden (345 million pounds), used entirely for industrial purposes, accounted for 83 percent of the 1962 New Jersey catch. Six species--surf clams, scup (porgy), fluke, whiting, sea bass, and butterfish--comprised 14 percent. The remaining 3 percent consisted principally of five species--blue crabs, oysters, cod, hard clams, and bluefish.

Scup (porgy) catches (14.7 million pounds) again surged ahead in 1962 due to the addition of six purse-seine vessels to the regular fleet and the great quantity of this species available to the inshore and offshore draggers during the spring through fall months.



Catch of certain fish and shellfish, 1962 and 1961

Sea-bass production by fish-pot operators has been on the downgrade since the mid-1950's, but the fish showed up in excellent quantities, and the catches were steady throughout the pot-fishing season. As a result, prices held fairly firm.

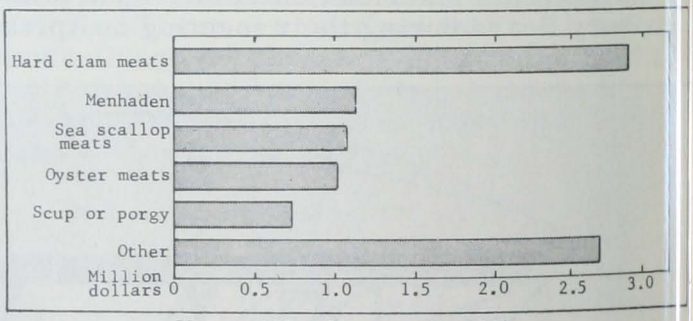
The production of blue crabs more than doubled the 1961 catch. Crabs were abundant in Delaware Bay, and there was a good market for the shellfish in Maryland and Virginia. Again in 1962, surf clams set a new high with a catch of 29.6 million pounds. The record production resulted from the addition of several vessels to the clam fleet, an increase in the number of crewmen to handle clams aboard the vessels, and the continued demand for surf clam products.

From 1957 to 1961, lobsters have shown an increase in production, with more vessels being added to the fishery each year. However, there was a significant drop in the catch during 1962. Ninety percent of the lobsters landed in Jersey was taken by otter trawls.

New York

FISHERY LANDINGS, 1962:

Total landings of fish and shellfish in the Marine District of New York during 1962, exclusive of unclassified fish for reduction, amounted to 140.3 million pounds valued at $9.7 million. Compared with 1961, this was an increase of 13 percent in quantity and 6 percent in value. The increase in volume was primarily attributed to greater landings of menhaden, particularly during the latter part of the operating season; and yellowtail flounders. Significant declines occurred in scup (porgy) and fluke.

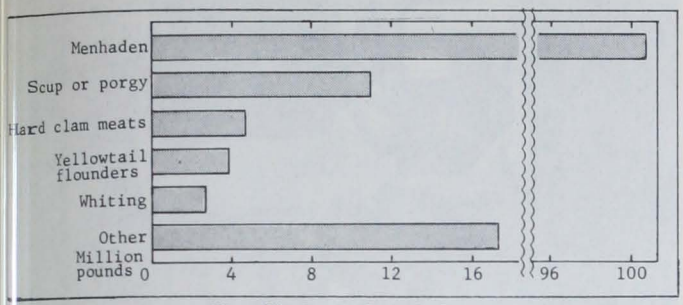


Value of New York catch, 1962.

As a result of greater availability of fish and increased shore processing facilities, landings of yellowtail flounders were 1.8 million pounds above the 1961 catch. Landings of scup (porgy) decreased 1.4 million pounds. The decline in fluke landings that began in 1960 continued through 1962.

The striped bass catch (608,000 pounds) was back to nearly normal from the record 839,000 pounds taken in 1961, when unusually large runs occurred in October and November. The production of fish for animal food

was not as great as in 1961; however, a considerable quantity of sea robins and whiting was used for this purpose.



New York catch, 1962.

New York City's Fulton Fish Market continued to be the State's major fishing port. As in past years, the major species landed was scup (porgy), taken during the fall and winter season, and sea scallops. Most of the sea scallops were landed by transient vessels from New England and ports of the Middle Atlantic area. Total landings at Fulton Market (10.9 million pounds) declined 375,000 pounds below the previous year. Species landed in reduced volume were scup, fluke, whiting, and sea scallops.

Bay-scallop production was at a high level, exceeding that of any previous year. Production was heavy from January through March, and in the fall, but dropped sharply in December.

North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER CONTINUED:

M/V "Commando" Cruise 7: The tenth in a series of cruises to survey the fauna in 50-850 fathoms southwest of the mouth of the Columbia River was completed on May 17, 1963, by the U. S. Bureau of Commercial Fisheries chartered research vessel Commando.

A standard 400-mesh eastern commercial otter trawl with a small-mesh liner was used to sample at stations to a depth of 450 fathoms. At depths greater than this, a 70-foot balloon shrimp trawl was used.

Sablefish (Anoplopoma fimbria) and Dover sole (Microstomus pacificus) were taken at stations from 50 to 450 fathoms. The largest catch of sablefish was 800 pounds per hour of trawling at a depth of 350 fathoms; for Dover sole it was 3,200 pounds per hour at the 175-fathom station. Ocean perch (Sebastodes alutus) was taken from 100 fathoms to 225 fathoms. The best catch of 3,500 pounds was made in 175 fathoms. Rex sole, Glypotecphalus zachirus, (700 pounds) were taken at 100 fathoms, while lesser amounts were caught to a depth of 250 fathoms.

At the 750- and 850-fathom stations approximately 350 and 200 pounds of fish and invertebrates, respectively, were taken in the balloon shrimp trawl. In both hauls the major portion of the catches by weight was composed of grenadiers. Several species of fish were also taken at those depths which had not been identified.

Adult tanner crabs (Chionoecetes tanneri) were caught at depths from 275 to 450 fathoms with almost complete separation of the sexes. The largest catch of males occurred at 275 fathoms where 33 crabs weighing 90 pounds were taken in an hour drag. The depth of greatest availability for females was 375 fathoms where 96 crabs weighing 50 pounds were taken in a one-hour drag. Juveniles were caught out to 850 fathoms.

A few Dungeness crabs (Cancer magister) and scallops (Patinopecten caurinus) were taken at 50 fathoms and pink shrimp (Pandalus jordani) were encountered in small numbers from 75 to 150 fathoms. Several coonstripe shrimp (Pandalopsis dispar) were caught at 150 fathoms, and 40 specimens of another large shrimp, Pandalopsis ampla, were taken at the deepest station sampled, 850 fathoms.

The effectiveness of bottom sampling with the Smith-MacIntyre grab was enhanced by good weather, and 7 grabs were successfully made out to 250 fathoms. This extension of sampling into deeper water provided several additions to the species list.

The general availability of epifauna was greatest from 100 to 300 fathoms with echinoderms (starfish, sea urchins, sea cucumbers) dominating the catches. The sea urchin, Allocentratus fragilis, again appeared in fair numbers in the catches over that range.

In addition to sampling fauna at each stations, bottom temperatures, salinities, and cores of the substrate were taken at most of the stations. The cores were taken for use

by personnel from the University of Washington College of Fisheries in their study on heterotrophic marine bacteria.

Samples of fauna collected for the Atomic Energy Commission for radiological analysis were delivered to the Laboratory of Radiation Biology, University of Washington.

Tanner crabs and English sole were collected for the Bureau's Technological and Biological Laboratories in Seattle.

Personnel from the Oregon Fish Commission were aboard during part of the cruise to continue tagging of sablefish and Dover sole along the track.

Note: See Commercial Fisheries Review, April 1963 p. 22, and January 1963 p. 42.

Oceanography

ANNUAL MEETING OF AMERICAN SOCIETY OF LIMNOLOGY AND OCEANOGRAPHY:

The American Society of Limnology and Oceanography, Inc., held its twenty-sixth annual meeting at the University of Michigan, Ann Arbor, Michigan, on June 13-15, 1963, in conjunction with the Sixth Conference on Great Lakes Research. The program theme of the meeting was to be the aquatic environment with sessions devoted to physical and chemical characteristics, geological and meteorological characteristics, biological integrators, and water resources.

* * * * *

NEW DEVICE USED IN MONTHLY TEMPERATURE SURVEY OF MID-ATLANTIC SHELF:

A monthly survey of surface water temperature fields over the continental shelf of the mid-Atlantic Bight with an airborne infrared radiometer is the beginning of an expanding program of coastal Atlantic oceanography. The routine surveys were initiated in December 1962, by the Sandy Hook (N. J.) Marine Laboratory of the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service, in cooperation with the United States Coast Guard. The survey program was made practicable by the development of an inexpensive (under $2,000) production model infrared radiometer by an engineering company in Stamford, Conn.

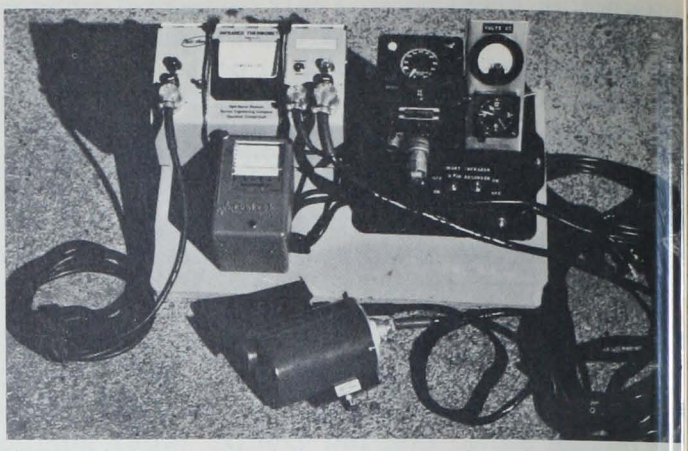


Fig. 1 - Airborne infrared thermometer and accessory equipmen lower front, infrared optical detector head; upper left, infrare electronic circuity and temperature indicator; below, strip cha recorder; upper right, intervalometer for visual readout timing clock and voltmeter.

The aerial survey is designed to provide near-simultaneous observations of tempera ture and water movement over an area of about 16,000 square miles. The temperatur data are being collected to help unravel the mysteries of the influence of environmental parameters on the distribution of migratory fishes and seasonal cycles of ocean produc tivity.

Infrared detection of ocean surface temperatures was first used by two scientists o the Woods Hole (Mass.) Oceanographic Institution in 1953. Ten years of development work produced an infrared radiometer whic is compact and completely portable. Becaus of its simplicity of design and its ruggedne s the instrument lends itself ideally to routin aerial surveys.

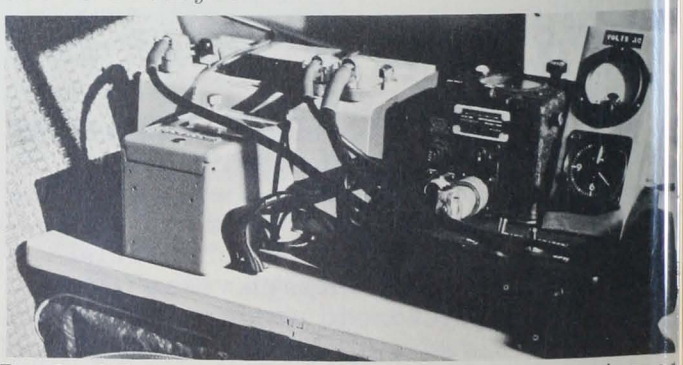


Fig. 2 - Airborne infrared thermometer and accessory equipmen positioned in the light aircraft.

The infrared radiometer operates by measuring the changes in electrical resista of a detector flake which results from heati of the flake by infrared radiation. The signa output is read out on a meter (or strip chart recorder) calibrated in Fahrenheit degrees. The optical system of the instrument is de signed to pass only wave lengths in the 8-13

nicron band. This virtually eliminates re-
lected radiation and radiation from the at-
nosphere itself which are composed mostly
f wave lengths outside the 8-13 micron band.

Precautions have been taken to minimize
r eliminate errors associated with the in-
erfering effect of infrared radiated to the
adiometer from moisture in the atmosphere.
lights are made only when coastal weather
s clear and there is no general precipitation.
eadings made in snow flurries, rain squalls,
r fog patches are not used. In light fog or
aze, flying altitude is reduced to the mini-
num--about 300 feet.

Since the infrared radiometer measures
nly the microsurface of the sea (the upper
ew millimeters), conversion factors are
orked out for each survey to equate the re-
sults with those of conventional methods
which usually give average temperatures for
bout the upper meter of water. This is done
y comparing the results with surface tem-
peratures recorded by 4 U. S. Coast Guard
ightships located on the flight track. Attempts
re being made to increase the number of
surface checkpoints by obtaining temperature
eadings from charter fishing craft in the
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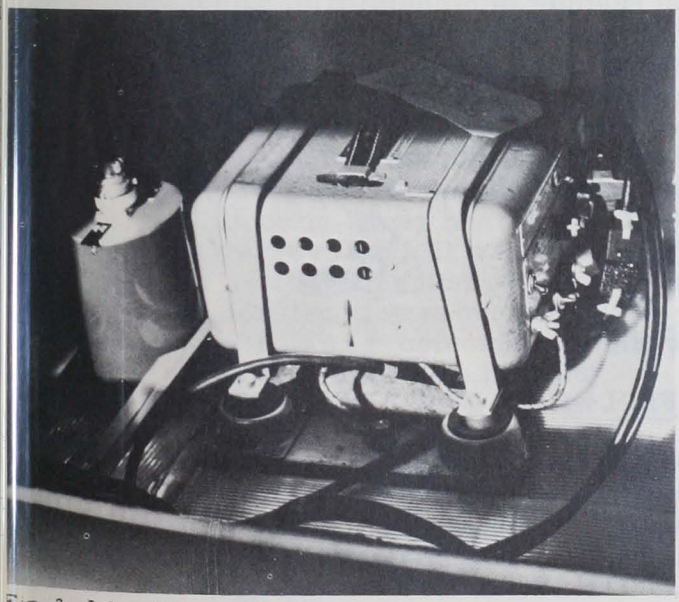


Fig. 3 - Infrared detector head and power supply convertor shock-mounted on the aircraft luggage compartment floor. Detector looks vertically through a small hole in the bottom of the fuselage at the ocean's surface.

Aircraft for the survey are operated by the U. S. Coast Guard Air Station, Floyd Bennett Field, Brooklyn, N. Y. The monthly survey is made in two 5-hour flights on consecutive days, thus providing near-synoptic coverage along the 1,200 miles of flight track.

Plans were under way to expand the temperature survey program to cover the Atlantic Continental Shelf from Cape Cod, Mass., to the Florida Keys.

Note: See Commercial Fisheries Review, February 1963 p. 44.

Oregon

RECORD YEARLING SILVER SALMON RELEASE:

Nearly 8.5 million yearling silver salmon were released in Oregon waters by the State's hatchery system during the first part of 1963. Of the total, the Columbia River received 5.7 million of the young silvers, Oregon coastal streams south of the Columbia received some 2.7 million, and for the Willamette River and its tributaries the total was 100,000 fish.

The number of yearling silver salmon planted by Oregon increased from 3.8 million in 1960 to 6.7 million in 1961, and to 7.7 million in 1962. In addition to the yearlings released, large numbers of fingerling silver salmon less than a year old have been planted in Oregon waters.

An Oregon Fish Commission representative said that much of the credit for the successful hatchery program must be given to the Oregon food pellet for hatchery fish. It has been acclaimed in Northwest fish culture circles and is being used by the Washington State Department of Fisheries and the U. S. Bureau of Sport Fisheries and Wildlife. The moist pellet is made from a combination of meals and fishery byproducts from the commercial fishing industry. (Oregon Fish Commission, May 10, 1963.)

Note: See Commercial Fisheries Review, May 1963 p. 37.

Oysters

CHLOROPHYLL VALUE TO OYSTER GROWTH STUDIED:

At the U. S. Bureau of Commercial Fisheries Biological Laboratory at Oxford, Md., seed oysters were collected from Mulberry Point in Broad Creek for the purpose of studying their growth in different environments. Strings containing a sample of the seed will be suspended from a fiberglass raft in a local natural pond. Other strings of seed will be suspended at different localities in the Tred

Avon River for growth comparisons. In conjunction with the growth studies, samples of water collected adjacent to the strings will be analyzed weekly for chlorophyll "a". The purpose of these samples will be to determine if there is a relation between the amount of chlorophyll and oyster growth.

* * * * *

OYSTER FEEDING TESTS:

Plans and preparations were made in April this year at the Bureau's Oxford Laboratory for the 1963 field and laboratory shellfish culture studies. Oysters were collected for a new feeding experiment which was to be initiated in May. These oysters (2-3 inches long) were to be divided into several groups and placed in the Laboratory's cement tanks. One group was fed continuously a supply of Phyladactilum tricornutum. The purpose of this experiment was to determine if supplementary feeding can improve the condition of tank-held oysters.

* * * * *

OYSTER MORTALITY STUDY CONTINUES:

Sampling of oysters from Marumsco Bar, Pocomoke Sound in Chesapeake Bay, was continued during April by the staff of the Bureau's Laboratory at Oxford. Ratio of gapers (dying oysters) and recently dead oysters to live oysters indicated a total March 1963 mortality of 17 percent.

Estimation of cryostat sections revealed that only 3 oysters from a total monthly sample of 60 oysters were infected with the MSX disease. This is a significant decrease in MSX incidence compared with the corresponding period of 1962. None of the 12 gapers examined were infected with MSX. However, gapers from the more recent monthly samples as examined by fresh smear, were all found to be infected with Hexamita. All thioglycollate cultures of the total monthly samples were found to be negative for Dermocystidium.

* * * * *

"CHLORELLA" AIDS GROWTH OF OYSTERS:

At the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., a test of the food value of "wild" Chlorella to oyster spat showed again that spat receiving adequate quantities of Chlorella, as a supplementary food, grow at a rate three times as fast as spat not receiving the Chlorella.

However, the three experiments conducted as of April 1963 strongly suggest that the method of supplying Chlorella to the rearing trays has a significant effect on the amount of Chlorella actually received by the tray, which is reflected in the subsequent growth of the spat. For example, when paired trays theoretically receive the same quantity of Chlorella from two different levels of a vertical feed line, the spat in the bottom tray invariably grow much faster than those in the top tray. This suggests that the Chlorella is not equally distributed within the vertical feed line but settles toward the bottom. An experiment is in progress to test this possibility.

* * * * *

STARFISH CHEMICALS SCREENED FOR TOXICITY:

At the Bureau's Laboratory at Milford, 44 compounds were screened in April this year for toxicity to starfish. Although 14 proved to be lethal at 100 parts per million (p. p. m.) none was effective at concentration levels feasible for use in the field. Secondary screening of 8 chemicals, which show promise for control of starfish, to determine possible toxicity to oysters has shown that ½-inch spat can survive exposure to 2 of the compounds at 10 p. p. m. for a period of two weeks although one compound did prevent normal feeding activity.

Pollution

FISH KILLS BY WATER POLLUTION, 1962:

More than 7 million fish were killed by water pollution in 1962, according to a report issued in May 1963 by the U. S. Public Health Service.

The 1962 total does not include a massive single kill of an estimated 37.8 million fish which took place in San Diego Harbor in August 1962, nor does it include other kills which may have taken place in nonreporting States.

Domestic sewage was listed as the most common cause of fish kills accounting for 3.3 million dead fish. Industrial wastes

These fish, including some trout, were found dead in a Pennsylvania Creek from chemical poisoning.

killed more than 1.1 million fish, mining operations accounted for 700,000, and agricultural poisons 91,000. In 1961, agricultural poisons were the chief cause of fish kills when they accounted for 5.6 million fish.

There were two exceptionally large kills reported in 1962. The 37.8 million in San Diego Harbor was the largest single fish kill reported to the U. S. Public Health Service. A large amount of oil, known to be toxic to fish, had been dumped in the coastal waters. The group of dead fish measured 1,000 by 10 feet and averaged 3 feet deep.

The other large kill occurred on September 20, 1962, when about 3.2 million fish were killed in the Anacostia River near Washington, D. C. This heavy fish kill was caused by the dumping of about 40 million gallons of raw sewage during construction around the sewage system. There was a coincidental migration of a large school of branch herring which swam into the discharged sewage.

The river mileage affected in the reports for 1962 totaled 1,500 miles. There were also 25 miles of shoreline and 2,600 acres of lakes affected by the reported kills.

Puerto Rico

NEW TUNA CANNERY ACTIVATED IN APRIL 1963:

A new Puerto Rican tuna cannery, located in Mayaguez, was dedicated in March 1963, and began canning operations early in April. The new plant has 150,000 square feet of space, three packing lines, a can fabricating unit, a fish-meal reduction plant, and a cold-storage warehouse with a capacity of 3,000 tons.

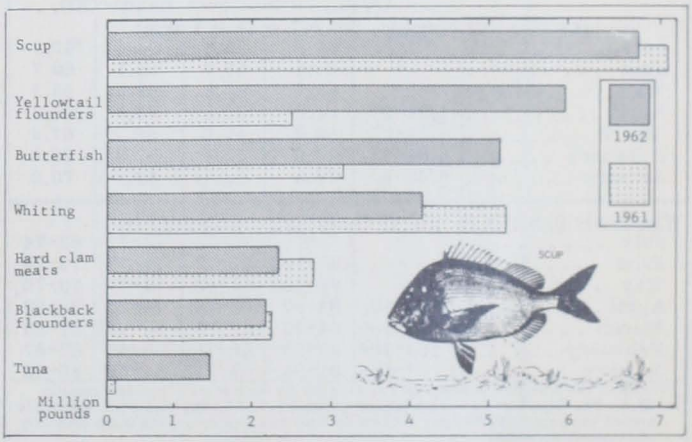
When in full production, the new plant is expected to turn out about 150 tons of canned tuna daily and employ about 450 people. The annual payroll is estimated to be about $1 million.

Rhode Island

FISHERY LANDINGS, 1962:

Landings of fish and shellfish at Rhode Island ports during 1962 amounted to 76.5 million pounds valued at $3.5 million. Compared with 1961, this was a drop of 7.6 million pounds, but a gain of $151,000. The catch used for food was up 13 percent; but that for industrial purposes, principally fish meal, dropped 20 percent.

During 1962, scup led all edible items with 6.7 million pounds, yellowtail flounders were next with 5.7 million pounds, and butterfish third with 4.9 million pounds. Whiting, hard clams, blackback flounders, and tuna followed with 4.0, 2.1, 2.0, and 1.1 million pounds, respectively. These seven items comprised 86 percent of the 1962 total edible production.



Rhode Island landings of certain species, 1962 and 1961.

The majority of the 1962 catch was taken by otter trawlers--58.5 million pounds, 77 percent of the year's total. Purse seines took 8.9 million pounds or 12 percent, floating traps were next with 6.3 million pounds or 8 percent, and various other types of gear caught 2.8 million pounds or 3 percent.

May landings of 18.7 million pounds were highest--73 percent was used for industrial purposes. June was second with 12.4 million pounds, and October third with 6.9 million pounds.

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, APRIL 1963:

Item and Period	1963	1962	1961	1960	1959
		. . . . (1,000 Lbs., Heads-Off)			
Total landings, So. Atl. and Gulf States:					
June	-	11,316	8,233	12,427	14,547
May	-	6,151	5,276	6,335	6,885
April	3,900	3,349	3,171	4,728	3,595
March	3,570	3,317	4,754	4,099	2,950
January-February	7,910	7,953	9,596	9,186	7,537
January-December	-	105,500	91,396	141,035	130,660
Quantity canned, Gulf States 1/:					
June	-	4,913	3,438	6,920	7,061
May	-	1,794	1,208	1,461	2,461
April	-	12	9	66	74
March	50	86	35	117	85
January-February	850	733	273	470	407
January-December	-	23,210	14,500	26,394	22,659
Frozen inventories (as of end of each mo.) 2/:					
June 30	-	13,796	19,416	15,338	19,283
May 31	-	13,904	24,696	17,540	21,137
April 30	3/	15,637	27,492	20,502	23,331
March 31	4/27,970	16,607	31,345	23,232	24,893
February 28	4/28,039	19,012	37,612	29,063	27,555
January 31	4/28,487	21,328	37,842	34,332	30,858
January 1	31,577	19,755	40,913	37,866	32,844
Imports 5/:					
June	-	9,397	8,065	8,932	8,300
May	-	11,221	8,278	9,902	8,264
April	3/	10,219	9,208	7,733	9,051
March	13,616	9,658	10,347	8,545	8,492
January-February	25,239	23,506	21,270	16,253	15,719
January-December	-	141,384	126,268	113,418	106,555
		. . . (¢/lb., 26-30 Count, Heads-Off). . .			
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
July	-	82.1	55.8	54.6	49.2
June	-	84.4	53.7	64.1	60.7
May	-	83.7	52.8	62.9	63.3
April	6/82-90	82.2	55.4	60.6	65.2
March	6/85-92	80.9	56.0	56.3	67.6
February	6/84-93	78.9	53.5	51.8	69.6
January	6/82-90	76.3	52.5	49.4	70.9
Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.:					
July	-	-	70-75	72-77	62-74
June	-	102-104	67-72	76-77	73-74
May	-	96-103	67-69	74-77	70-76
April	100-105	94-97	69-70	74-75	75-82
March	102-106	94-95	69-71	65-68	81-83
February	102-106	93-95	69-71	65-67	82-87
January	102-106	91-94	69-71	64-66	86-88

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Not available.
4/Inventory of Jan. 31, 1963, includes 444,000 pounds; Feb. 28, 1963, includes 957,000 pounds; and Mar. 31, 1963, includes 1,536,000 pounds for firms not reported previously.
5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
6/Range in prices at Tampa, Fla; Morgan City, La., area; Port Isabel and Brownsville, Texas, only.
Note: Data for 1963 and 1962 are preliminary. April 1963 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

South Atlantic Exploratory Fishery Program

EXPLORATORY FISHING FOR COMMERCIAL SPECIES OFF GEORGIA AND FLORIDA:

M/V "Silver Bay" Cruise 48 (May 6-19, 1963): The primary objectives of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay were to (1) demonstrate the techniques of bottomfish trawling to interested members of the shrimp fishing industry, and (2) assess the seasonal and geographic availability to otter trawls of food fish species. Fishing was conducted on the Continental Shelf from Jacksonville, Fla. to Savannah, Ga. (Map, page 53.)

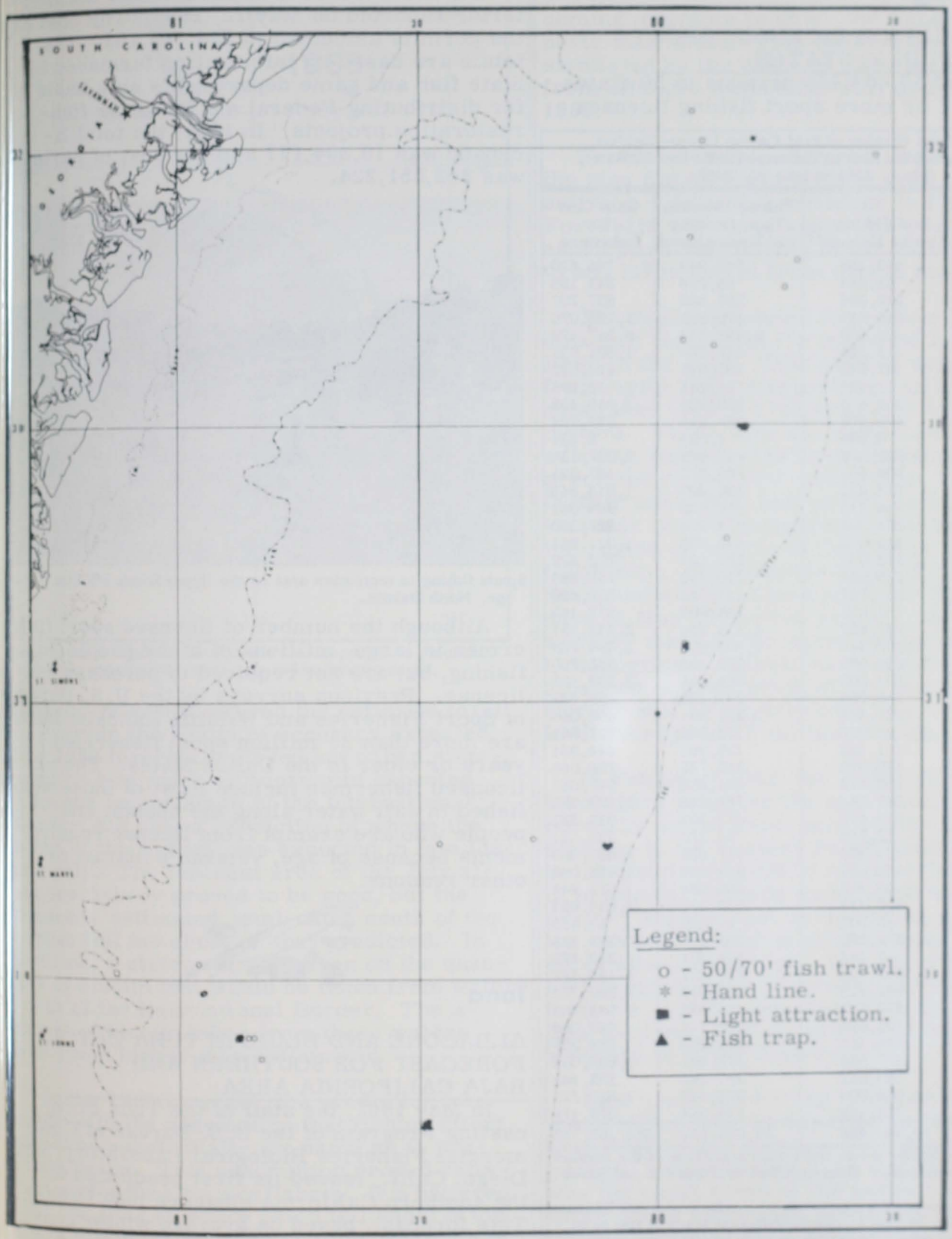
Industry members interested in rigging their vessels for fish trawling were taken on a 2-day demonstration cruise from Fernandina Beach, Florida. A 50/70-foot roller-rigged nylon fish trawl, suitable for use with modern shrimp vessels, was used. It was fished with 8-foot bracket doors, 10-fathom leglines, and standard V/D rig.

Fishing depths ranged from 15 to 40 fathoms and catches ranged up to 4,500 pounds per 60-minute drag. The largest catches per drag of the dominant species were as follows: Vermilion snapper (Rhomboplites aurorubens) 2,200 pounds, Scup (Stenotomus chrysops) 2,690 pounds, porgy (Pagrus and Calamus species) 539 pounds, grunt (Haemulon aurolineatum) 650 pounds, and black sea bass (Centropristes striatus) 110 pounds.

Approximately 4,500 pounds of Virginia croakers (Micropogon undulatus), averaging 2 to 3 pounds per fish, were taken in a 1-hour drag 68 miles east of Sapelo Island in 24 fathoms.

Hand lines used on rough bottom areas from east of Fernandina Beach, Fla., to east of St. Simons Island, Ga., took snapper and grouper in the 26 to 33 fathoms depth range. The largest catch was 910 pounds. It was taken by 5 hand lines fished for 150 minutes, and consisted of 33 red snapper (Lutjanus species) totaling 438 pounds and 21 grouper (Mycteroperca and Epinephelus species) totaling 472 pounds.

Note: See Commercial Fisheries Review, June 1963 p. 41.



Areas investigated during Cruise 48 of the M/V Silver Bay (May 6-19, 1963).

Sport Fishing

OVER 19 MILLION LICENSED SPORT FISHERMEN IN 50 STATES:

A total of 19,403,465 persons in 50 States purchased 1 or more sport fishing licenses during 1962, the U. S. Department of the Interior reported on May 12, 1963. The cost of the permits amounted to $54,163,163. The totals are based on information furnished by State fish and game departments as a basis for distributing Federal aid funds for fish-restoration projects. In 1961, the total licensed was 19,394,177 and the cost of permits was $52,851,224.

Summary of the Number of Paid Fishing License Holders, License Sales, and the Cost to Fishermen in the United States, July 1, 1961 to June 30, 1962

States	Paid Fishing License Holders 1/	Fishing Licenses, Tags, Permits, and Stamps Issued	Gross Cost To Fishermen
Alabama	413,159	545,943	$ 786,820
Alaska	53,583	56,798	343,156
Arizona	212,266	282,825	807,707
Arkansas	456,663	456,663	1,183,070
California	1,485,809	3,495,742	6,247,472
Colorado	413,525	417,184	1,501,931
Connecticut	107,545	107,545	414,522
Delaware	11,141	11,141	18,396
Florida	502,610	520,927	1,068,498
Georgia	495,882	497,281	588,994
Hawaii	4,209	4,209	8,824
Idaho	239,374	240,403	1,007,136
Illinois	700,654	705,777	1,487,023
Indiana	754,431	760,499	1,013,848
Iowa	414,215	419,528	963,041
Kansas	271,362	271,776	827,360
Kentucky	316,090	316,970	1,021,961
Louisiana	223,031	224,601	272,429
Maine	229,019	230,192	758,381
Maryland	111,741	111,741	339,390
Massachusetts	183,924	145,903	578,165
Michigan	927,627	1,115,136	2,712,551
Minnesota	1,287,947	1,308,851	2,494,789
Mississippi	285,898	292,138	542,780
Missouri	691,005	884,766	2,509,597
Montana	235,709	231,138	459,883
Nebraska	221,301	221,301	468,054
Nevada	63,098	72,082	227,801
New Hampshire	121,192	128,962	444,981
New Jersey	138,950	215,744	758,066
New Mexico	142,168	144,856	547,061
New York	727,246	727,246	2,379,985
North Carolina	319,277	477,403	933,267
North Dakota	72,719	54,270	125,411
Ohio	821,452	821,822	1,683,303
Oklahoma	462,695	465,416	1,036,088
Oregon	436,407	665,983	1,577,943
Pennsylvania	602,323	602,323	2,013,633
Rhode Island	15,207	21,820	51,555
South Carolina	272,192	303,274	599,124
South Dakota	148,443	152,301	293,822
Tennessee	649,743	888,287	1,128,527
Texas	832,913	832,913	1,790,763
Utah	172,762	185,636	572,958
Vermont	101,028	102,111	240,066
Virginia	324,165	508,395	883,209
Washington	377,546	377,621	1,639,052
West Virginia	160,051	251,148	555,862
Wisconsin	1,060,000	1,071,469	3,620,729
Wyoming	132,168	136,554	679,179
Totals	19,403,465	23,084,614	$54,163,163

1/A paid license holder is one individual regardless of the number of licenses purchased. Data certified by State fish and game departments.

Note: Some States require sportsmen to purchase separate licenses, stamps, permits, or tags to fish for different kinds of fish or to fish in different areas. Many States offer trip or short-term licenses good for from 1 to 15 days while other States issue only one license which is legal for all types of fishing. Thus, the total number of paid fishing license holders does not equal the number of total fishing licenses, tags, permits, and stamps issued.

Source: Compiled from information furnished by the State fish and game departments.

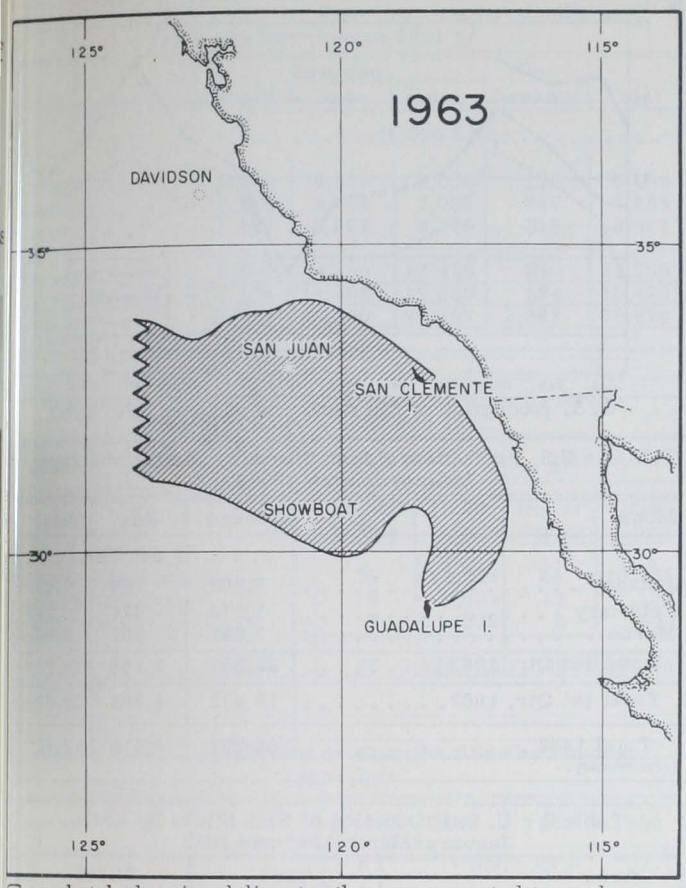
Sports fishing in recreation area on the Upper Souris Wildlife Refuge, North Dakota.

Although the number of licensed sport fishermen is large, millions of other people go fishing, but are not required to purchase a license. Previous surveys by the U. S. Bureau of Sport Fisheries and Wildlife indicate there are more than 25 million sport fishermen 12 years or older in the United States. The unlicensed fishermen include most of those who fished in salt water along the coasts, and people who are exempt from license requirements because of age, veteran's status, or other reasons.

Tuna

ALBACORE AND BLUEFIN TUNA CATCH FORECAST FOR SOUTHERN AND BAJA CALIFORNIA AREA:

In May 1961, the staff of the Tuna Forecasting Program of the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, Calif., issued its first prediction for the southern California albacore tuna fishery. This forecast, based on average winter coastal temperatures at Scripps Pier, La Jolla, and Balboa, Calif., was limited to a prediction of the total amount of albacore expected to be taken from waters south of the International Border between the United States and Mexico.



Cross-hatched region delineates the area expected to produce about two-thirds of the total July 1963 albacore catch.

Subsequent events proved the estimate to fall well within the limits of accuracy expected. The 1962 forecast included not only a statement on how much albacore was expected from the region south of the International Border, but also a prediction of where the onset of the fishery was expected in late June and July. The forecast area of the July albacore fishery proved to be good, but the season's estimated total catch south of the border fell far short of that predicted. In addition, a statement was given on the quantity of bluefin that would be taken from waters north of the International Border. The amount of bluefin taken from those waters was much higher than anticipated.

In the 1962 forecast, the prediction was made with the assumption that fishing effort would be substantially the same as in previous years. This assumption proved satisfactory for the albacore fishery. It is believed that the 1962 albacore catch fell short of the mark predicted because of rapid warming of ocean temperatures in August off Baja California and southern California. Also, an extensive warm temperature anomaly developed in California offshore waters in July and August, which appeared to cause late incoming migrants to enter the fishery farther north than usual. This observation was substantiated by the catch of Navy picket vessels from offshore waters for July and August of 1962.

Severe economic disturbances confronting the tuna fishing industry this year could result in a substantial reduction in fishing effort. Forecasts are made again this year on the assumption that fishing effort will not deviate to any large extent from that in the past.

The region expected to produce the best albacore catches in the month of July is outlined in the map. This area is determined from April 1962 temperature and salinity data taken over a wide area at a depth of 10 meters. These data are combined to produce a "catch index." The area of optimum catch predicted by the 1963 catch index is situated farther north than last year's and reflects an increase of both temperature and salinity in the region off southern California and Baja California. Sea temperatures off San Juan Seamount and Pt. Conception for the first 15 days of May 1963 were as much as 3° F. warmer than for the same period in 1962. Oceanographic conditions suggest also that albacore catches south of the International Border will be slightly less than the 1945-1960 average of 15 million pounds.

In February 1963, the Bureau's San Diego laboratory reported the occurrence of abnormally warm water temperatures at coastal stations in the eastern Pacific and that spring heating had appeared to start early. Analyses of historical records maintained by the laboratory suggest that early spring heating in the eastern Pacific is accompanied by an early albacore season. The rapid heating that began in early February did not continue, however, and the data available by late April this year was less suggestive of early commencement of the fishery.

Last year, the fishing effort on bluefin was much higher than at any time in the past (more than 3 times the average for the preceding 10 years). This appears to be a major reason why the catch north of the border was about three times more than predicted. Ocean conditions indicate that a substantial bluefin fishery could again develop in California waters as it did in 1962. On the basis of fishing effort comparable to years prior to 1962, the staff of the Bureau's Tuna Forecasting Pro-

gram predicts that 7.7 million pounds will be landed from the region north of the International Border; however, if bluefin fishing effort continues at the 1962 level, as much as 15-20 million pounds could be landed from that area.

The Bureau's research vessel Black Douglas and California Department of Fish and Game's N. B. Scofield were participating in a joint pre-season albacore-oceanography cruise beginning the latter part of May 1963. These vessels kept the fishing industry advised of the time and place of the early catches and also monitored any short-term changes in environmental conditions observed while they are at sea. (Staff, Tuna Forecasting Program, U. S. Bureau of Commercial Fisheries, Biological Laboratory, San Diego.)

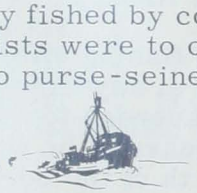
* * * * *

SCHOOLING BEHAVIOR STUDY:

To study the schooling behavior of juvenile and adult tuna was to be the main purpose of a 90-day cruise in Costa Rican waters by the chartered vessel, Red Rooster, of the U. S. Bureau of Commercial Fisheries Biological Laboratory at San Diego. The vessel arrived in Puntarenas, Costa Rica, on March 25, 1963, after completing some studies of sharks and porpoises en route from San Diego.

Costa Rican waters were chosen for the survey because they offer a dependable supply of young tuna. Bureau scientists aboard the Red Rooster planned to study juvenile tuna at sea as well as to capture specimens for study in aquariums ashore. The cruise provided an opportunity for work on experiments designed to isolate the stimuli involved in tuna schooling behavior. The mechanisms involved in the maintenance of schools of jack mackerel were also to be studied.

In addition, since the waters off Costa Rica are heavily fished by commercial tuna vessels, scientists were to observe the reaction of tuna to purse-seine nets.

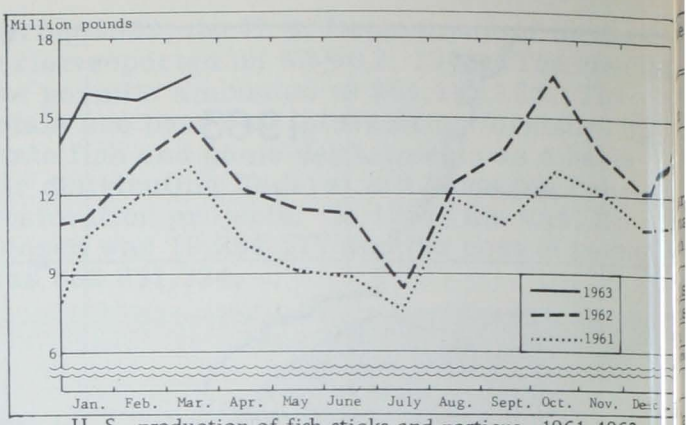


United States Fisheries

FISH STICKS AND PORTIONS PRODUCTION, JANUARY-MARCH 1963:

United States production of fish sticks amounted to about 23.7 million pounds and that of fish portions was 24.3 million pounds during the first quarter of 1963, according to preliminary data. This was a gain of nearly 15 percent in fish sticks and 31 percent in portions as compared with the same quarter of 1962. The increase was due to a greater production of raw breaded portions (up 4.6 million pounds).

Cooked fish sticks (22.6 million pounds) made up 95 percent of the fish stick total. The remaining 5 percent con-



U. S. production of fish sticks and portions, 1961-1963.

Table 1 - U.S. Production of Fish Sticks by Months and Type, January-March 1963 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
January	7,300	334	7,634
February	7,776	470	8,246
March	7,481	365	7,846
Total 1st Qtr. 1963 1/	22,557	1,169	23,726
Total 1st Qtr. 1962	19,423	1,203	20,626
Total 1962	66,801	5,416	72,217

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, January-March 1963 and 1962

Area	1/1963		2/1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	18,999	22	16,284
Inland & Gulf States	5	2,448	6	2,167
Pacific Coast States	10	2,279	9	2,175
Total	37	23,726	37	20,626

1/Preliminary.
2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1959-6

Month	1/1962	2/1961	1960	1959
	(1,000 Lbs.)			
January	6,082	6,091	5,511	6,2
February	6,886	7,097	6,542	6,3
March	7,658	7,233	7,844	5,6
April	5,719	5,599	4,871	4,7
May	5,643	5,129	3,707	4,4
June	5,117	4,928	4,369	4,5
July	3,740	3,575	3,691	3,7
August	5,760	6,927	5,013	3,8
September	6,582	5,206	5,424	5,3
October	6,698	6,133	6,560	5,8
November	6,305	6,288	6,281	4,8
December	6,027	5,618	5,329	4,7
Total	72,217	69,824	65,142	60,3

1/Preliminary.
2/Revised.

Table 4 - U.S. Production of Fish Portions by Months and Type, January-March 1963 1/

Month	Breaded			Unbreaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.)				
January	1,395	6,609	8,004	195	8,199
February	1,292	5,794	7,086	297	7,383
March	1,382	6,987	8,369	318	8,687
Tot. 1st Qtr. 1963 1/	4,069	19,390	23,459	810	24,269
Tot. 1st Qtr. 1962	3,094	14,795	17,889	584	18,473
Total 1962	14,007	62,290	76,297	2,381	78,678

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Areas, January-March 1963 and 1962

Area	1/1963		2/1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	13,673	24	10,751
Inland & Gulf States	6	9,744	11	7,122
Pacific Coast States	7	852	8	600
Total	36	24,269	43	18,473

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1959-1962

Month	1/1962	1961	1960	1959
	(1,000 Lbs.)			
January	5,077	4,303	3,632	2,692
February	6,360	4,902	3,502	3,025
March	7,036	5,831	4,706	3,225
April	6,408	4,484	3,492	2,634
May	5,818	3,879	3,253	2,684
June	6,137	4,039	3,995	3,247
July	4,679	3,962	4,088	2,227
August	6,687	4,963	3,558	2,796
September	7,180	5,745	4,631	3,558
October	9,871	6,759	5,275	4,314
November	7,406	5,789	4,790	3,483
December	6,019	5,191	4,459	3,262
Total	78,678	59,847	49,381	37,147

1/Preliminary.

sisted of raw fish sticks. A total of 23.6 million pounds of breaded fish portions (of which 19.4 million pounds were raw) and 810,000 pounds of unbreaded portions were processed during the first quarter of 1963.

Plants on the Atlantic Coast produced the bulk of the fish sticks and portions--32.7 million pounds. The Gulf and Inland States produced 12.2 million pounds, and the Pacific Coast States 3.1 million pounds.

U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, APRIL 1963:

During April 1963, a total of 71 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 39 in April 1962. There were 56 documents cancelled for fishing vessels in April 1963 as compared with 22 in April 1962.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, April 1963 with Comparisons

Area (Home Port)	Apr.		Jan.-Apr.		Total
	1963	1962	1963	1962	1962
	(Number)				
Issued first documents 2/:					
New England	3	6	7	9	28
Middle Atlantic	2	-	4	1	3
Chesapeake	3	5	9	12	43
South Atlantic	5	3	18	10	47
Gulf	26	3	66	28	110
Pacific	31	22	47	37	130
Great Lakes	1	-	2	-	5
Puerto Rico	-	-	-	-	2
Total	71	39	153	97	368
Removed from documentation 3/:					
New England	14	2	19	8	24
Middle Atlantic	6	4	21	19	39
Chesapeake	1	2	6	5	23
South Atlantic	5	1	19	15	38
Gulf	19	5	42	34	104
Pacific	8	8	34	50	111
Great Lakes	2	-	5	8	22
Hawaii	1	-	1	3	3
Puerto Rico	-	-	-	-	1
Total	56	22	147	142	365

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, April 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	11	2
10-19	26	24
20-29	7	6
30-39	1	9
40-49	3	2
50-59	5	7
60-69	5	3
70-79	6	1
80-89	-	1
90-99	1	-
140-149	2	-
160-169	1	-
220-229	1	-
230-239	1	-
300-309	1	-
430-439	-	1
Total	71	56

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Vessels issued first documents as fishing craft were built: 52 in 1963; 1 in 1962; 3 in 1959; 2 in 1956; 1 in 1953; and 11 prior to 1951.
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

* * * * *

STUDY SHOWS NEED FOR VESSEL MODERNIZATION:

A pending Congressional bill (S. 1006, To amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes) would extend the life of the Federal Fishing Vessel Construction Differential Subsidy

Program from June of 1963 to 1972; extend coverage to the entire commercial fishing fleet; and increase the maximum allowable grant from 33⅓ percent to 55 percent. It also would prevent the vessel modernization program from causing economic hardship in a fishery already operating with an adequate number of efficient vessels and add additional authority for the recapture of a grant when the provisions of the law are violated.

In a letter to Senator Warren G. Magnuson, chairman of the Senate Committee on Commerce, Assistant Secretary of the Interior Frank P. Briggs emphasized the modernization of foreign fishing fleets and the corresponding drop of the United States from second to fifth place in world fisheries.

"The United States fishing industry has long been equipped with outmoded vessels and equipment which are continuing to deteriorate at an alarming rate," Mr. Briggs said. He added that one vessel, still in use, was launched in 1865 and that 35 percent of the Atlantic and Gulf Coast fishing vessels are between 11 and 20 years old.

In contrast with this, Secretary Briggs pointed out that "the vessels of other countries such as Russia and Japan are generally of modern design and construction. This is made possible by the lower costs of construction in foreign shipyards and in some cases the foreign governments assist their fishing fleets by paying subsidies.

"Large steel fishing vessels can be constructed in foreign shipyards for as much as 50 percent less than in domestic shipyards and wooden vessels can be constructed at costs in excess of 33⅓ percent less than in our own domestic yards."

A recent study of the age of United States commercial fishing vessels made by the Bureau of Commercial Fisheries of the U. S. Fish and Wildlife Service, placed the total number of United States fishing vessels of 5 net tons or over at 11,964. Of those, 4,805 are in the Pacific Ocean fisheries (including Hawaii), and 7,159 are operating in the Atlantic Ocean, Gulf of Mexico, and the Great Lakes. The study was based on information obtained by the Bureau of Commercial Fisheries from Bureau of Customs vessel documentation records.

The heyday of Pacific construction was in the 1939-1953 period when 2,500 vessels were launched. More than 500 ships now bei used on the west coast were constructed bef 1920 and approximately 500 have been launch since 1953. The oldest boat in Pacific servi is a salmon purse seiner of 1891 vintage; a salmon troller dates to 1894.

Of the approximately 6,600 craft in the Atlantic and Gulf of Mexico fisheries, 1,212 were built before 1940 and only about 2,800 were built during the past decade. The average age of the East Coast fleet is 18 years. One group, the Chesapeake menhaden purse-seiner fleet, has not added any new vessels since 1951.

The oldest fishing vessel operating out of an eastern United States port is the 45-foot Virginia, launched as a 2-masted schooner along Fish River, Alabama, in 1865 and converted to a commercial fishing craft in 1946. Two clam dredgers, one in New York and one in New Jersey, date to 1872; another New Jersey clammer was launched in 1873. A Gulf Coast shrimp vessel and a New England trawler date to 1874 and 1875; three menhaden vessels built in 1877 are still in service.

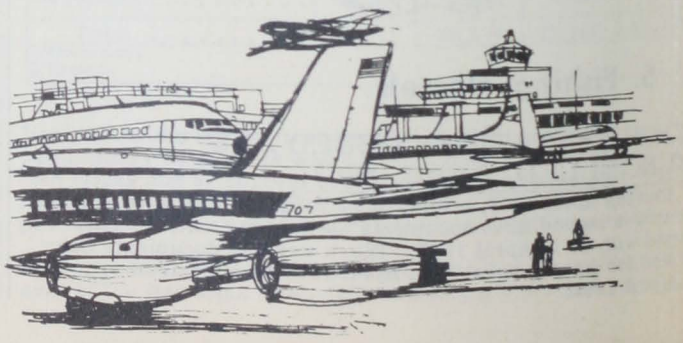
The age study showed that the Chesapeake sail-driven oyster dredgers constitute the oldest fleet with an average of 52 years in service. The first one was built in 1881.

U.S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, NOVEMBER-DECEMBER 1962

Airborne fishery imports into the United States showed what was probably a seasonal decline in November and December 1962. In November 1962, airborne imports of shrimp were 43 percent below those in the previous month due mainly to a drop in arrivals from Panama and Venezuela. In December 1962, shrimp imports showed some recovery, but air shipments of finfish products fell to a very low level.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in November 1962, shipments



consisted of 409,296 pounds of fresh or frozen raw headless, 126,103 pounds of frozen peeled and deveined, and 6,502 pounds of unclassified shrimp; in December 1962, shipments consisted of 649,881 pounds of fresh or frozen raw headless, 99,035 pounds of frozen peeled and deveined, and 3,900 pounds of unclassified shrimp. Almost 83 percent of the total airborne shrimp imports in November and December 1962 entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Galveston (Tex.), Laredo (Tex.), Los Angeles (Calif.), and New York City.

Airborne imports of shellfish other than shrimp in November 1962 included 21,244 pounds of live spiny lobsters, 70,920 pounds of spiny lobster tails, and 20,188 pounds of unclassified spiny lobster products. In December 1962, airborne spiny lobster arrivals consisted of 8,469 pounds of live lobsters, 101,748 pounds of lobster tails, and 900 pounds of unclassified spiny lobster products. In November and December, the spiny lobster airborne imports originated in Central and South American countries and entered through the Customs Districts of Florida, Galveston (Tex.), and Puerto Rico.

The fish products imported by air in November 1962 included small but high-priced shipments of Rumanian and Iranian caviar which entered through the Customs District of New York, and 157,874 pounds of fish fillets (mostly from Mexico) all of which entered through the Customs District of Florida.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

Shrimp accounted for 79 percent of the quantity and 80 percent of the value of the total airborne imports of fishery products during 1962. Live northern lobsters from Canada, spiny lobsters, and fish fillets were some of the other important fishery items imported by air in 1962.

U. S.[1] Airborne Imports of Fishery Products, January-December 1962

Product and Origin[2]	November Qty.[3]	November Value[4]	December Qty.[3]	December Value[4]	Jan.-Dec. Qty.[3]	Jan.-Dec. Value[4]
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Fish:						
Mexico	153.2	19.4	0.3	0.1	964.5	160.3
Azores	-	-	-	-	25.7	5.7
Rumania	0.6	4.6	-	-	1.9	15.9
Portugal	-	-	-	-	12.1	3.5
Canada	0.8	0.7	-	-	22.1	17.6
Panama	-	-	-	-	7.8	1.3
Costa Rica	-	-	-	-	5.6	0.9
British Honduras	14.8	2.7	5.6	1.2	39.8	8.7
Iran	5.8	58.7	-	-	13.9	142.9
Denmark	0.2	0.8	-	-	1.1	3.3
Other countries	0.9	1.3	2.2	0.9	4.0	3.5
Total fish	176.3	88.2	8.1	2.2	1,098.5	363.6
Shrimp:						
Guatemala	31.1	15.9	29.1	17.5	321.9	164.2
El Salvador	78.3	45.7	93.0	60.5	716.5	447.9
Nicaragua	6.5	3.7	12.2	4.0	1,008.6	343.6
Costa Rica	180.5	89.9	140.6	67.4	819.9	370.5
Panama	85.8	50.8	127.8	85.0	1,867.1	1,055.2
Venezuela	148.4	86.9	346.8	171.1	3,380.1	1,815.3
Ecuador	-	-	-	-	12.2	3.4
Mexico	-	-	-	-	24.7	9.0
Netherlands Antilles	-	-	-	-	3.1	2.7
Honduras	11.3	4.7	3.3	1.9	39.8	25.2
Argentina	-	-	-	-	10.5	4.9
Total shrimp	541.9	297.6	752.8	407.4	8,204.4	4,241.9
Shellfish other than shrimp:						
Canada	-	-	-	-	224.1	91.1
British Honduras	59.4	55.4	51.1	42.9	317.1	219.3
Honduras	1.0	0.5	0.8	0.6	141.5	104.5
Costa Rica	4.2	3.6	1.5	1.2	7.1	6.0
Panama	-	-	-	-	1.0	1.0
Jamaica	-	-	13.3	8.9	43.3	30.2
Netherlands Antilles	14.9	6.3	-	-	58.0	34.8
Venezuela	-	-	10.0	6.7	32.3	20.3
Mexico	19.4	10.8	6.3	5.7	94.0	61.6
Guatemala	1.4	0.6	-	-	12.9	6.3
Leeward and Windward Islands	4.7	1.8	2.6	1.0	31.3	11.9
Nicaragua	-	-	17.5	15.6	18.7	16.2
Colombia	-	-	-	-	1.8	5.1
Ecuador	1.0	0.4	1.1	0.5	3.7	2.1
El Salvador	-	-	0.9	0.5	7.1	5.1
Trinidad	-	-	-	-	2.3	1.0
Dominican Republic	4.1	2.8	3.5	1.8	33.2	28.3
Bahamas	14.7	4.5	5.0	1.3	37.5	12.3
Other countries	7.2	9.8	-	-	8.4	12.0
Total shellfish (excluding shrimp)	132.0	96.5	113.6	86.7	1,075.3	669.1
Grand total	850.2	482.3	874.5	496.3	10,378.2	5,274.6

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When the country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, November and December 1962, U. S. Bureau of the Census.

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EDIBLE FISHERY PRODUCTS, MARCH 1963:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in March 1963 were up 5.6 percent in quantity and 8.1 percent in value from those in the previous month. Imports were moderately higher in March for frozen albacore tuna, canned tuna in brine, canned sardines in oil and not in oil, frozen shrimp, swordfish fillets, flounder fillets, cod fillets, and fish blocks and slabs. But there was a sharp drop in imports of frozen tuna other than albacore.

Compared with the same month in 1962, imports in March 1963 were down 7.0 percent in quantity, but the value of the imports was the same in both months. There was a heavy cutback in imports of frozen tuna this March and imports were also down sharply for canned sardines in oil and canned tuna in brine. The decline was offset partly by much larger imports of canned sardines not in oil, frozen shrimp, and fish blocks and slabs.

In the first 3 months of 1963, imports were down 1.1 percent in quantity and 2.4 percent in value as compared with the same period in 1962. Although the over-all totals were about the same in both years, there was considerable fluctuation in individual import items. There was a large increase in 1963 in imports of canned sardines not in oil. Imports were also up for cod fillets, frozen tuna other than albacore, frozen salmon, frozen shrimp, sea scallops, and frozen frog legs. On the other hand, imports were down for frozen albacore tuna, canned tuna in brine, canned sar-

U. S. Imports and Exports of Edible Fishery Products, March 1963 with Comparisons

Item	Quantity March 1963	Quantity March 1962	Quantity Jan.-Mar. 1963	Quantity Jan.-Mar. 1962	Value March 1963	Value March 1962	Value Jan.-Mar. 1963	Value Jan.-Mar. 1962
	(Millions of Lbs.)				(Millions of $)			
Imports:								
Fish & Shellfish: Fresh, froz. & processed[1]	95.7	102.9	272.9	275.9	33.3	33.3	92.0	94.3
Exports:								
Fish & Shellfish: Processed only[1] (excluding fresh & frozen)	3.1	3.7	11.0	10.1	1.2	1.3	4.1	4.0

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

dines in oil, canned salmon, flounder fillets, haddock fillets, and fresh and frozen lobster.

Exports of processed fish and shellfish from the United States in March 1963 were down 26.2 percent in quantity and 7.7 percent in value from those in the previous month. Most of the decline was concentrated in exports of the lower-priced products such as canned mackerel, canned sardines not in oil, and canned squid, although shipments of canned shrimp were also down. The decline was offset partly by a sharp increase in exports of the higher-priced canned salmon.

Compared with the same month in 1962, exports in March 1963 were down 16.2 percent in quantity and 7.7 percent in value. Again, the decline was due mainly to a drop in exports of the lower-priced products, which was offset partly by larger shipments of canned salmon.

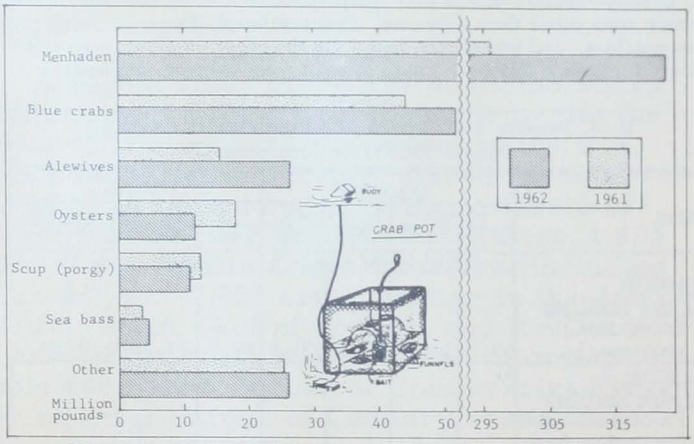
Processed fish and shellfish exports in the first 3 months of 1963 were up 8.9 percent in quantity and 2.5 percent in value from those in the same period of 1962. Exports of the lower-priced canned squid (principally to Greece and the Philippines) showed the greatest increase. Exports were also up for canned salmon, canned sardines not in oil, and canned shrimp. But there was a decline in exports of canned mackerel.

Virginia

FISHERY LANDINGS, 1962:

Landings of fish and shellfish at Virginia ports during 1962 totaled 453.9 million pounds valued at $21.3 million. Compared with 1961, this was an increase of 10 percent in quantity, but a decrease of 12 percent in value. In addition to the above landings, the seed oyster harvest amounted to 1.3 million Virginia bushels, valued at about $1.5 million.

The 1962 catch of menhaden for processing into meal, oil, and solubles as well as for bait accounted for 322.8 million pounds--71 percent of the total catch of all species.



Virginia landings of certain species, 1962 and 1961.

The alewife or river-herring catch was impressive, totaling 26.9 million pounds--a 73-percent increase over 1961. Practically the entire catch of alewives is taken in two months. The financial return for the comparatively few fishermen in the alewife fishery is substantial--more than one-half million dollars in 1962.

Shad, which are caught with alewives, showed almost the same proportionate increase (66 percent). The catch of spot almost doubled that of 1961.

There was a liberal catch of hard blue crabs in 1962, amounting to 51.8 million pounds, with a value to fishermen of $2.6 million--a poundage gain over 1961 of 18 percent and a record year. In contrast to the trend in the production of hard blue crabs, the supply of soft-shell and peeler crabs was down nearly 50 percent in 1962 from the preceding year.

There were sharp declines in the 1962 landings of certain species, particularly oysters, which have always furnished the bulk of the State's fishery dollars. In 1962, this item dropped 30 percent in quantity and value below 1961. Oyster production in 1962 was the smallest in the 44 years for which records are available since 1880, with the exception of 1937 when the catch was slightly less. Another scarce item in 1962 was the croaker. Landings of this species in 1962 were a little above 1 million pounds--the lowest recorded catch since 1891.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, MAY 1963:

In May this year the wholesale price trends for edible fishery products (fresh, frozen, and canned) were mixed. Generally higher prices for fresh fish and shellfish were partially offset by a further decline in the canned fish subgroup index and lower prices for frozen shrimp and halibut. The over-all wholesale price index at 115.9 increased 2.0 percent from April to May this year. Compared with the same month in 1962 the wholesale price index in May this year was down 2.9 percent.

Seasonal declines in the landings of haddock at New England ports plus an improvement in the quality of freshwater fish varieties from the Great Lakes resulted in an 8.3-percent increase in the May 1963 drawn, dressed, or whole finfish subgroup as compared with the previous month. Ex-vessel prices at Boston for drawn haddock in mid-May this year were up 37.9 percent from the mid-April price, and increased sharply from May a year ago. With the arrival on the market of halibut from this season's North Pacific catch, prices for the fresh and frozen product dropped 10.5 percent from April to May. Frozen halibut stocks from last season's catch were heavy in May and prices started to decline. Compared with the same month a year ago when ex-vessel halibut prices were

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			May 1963	Apr. 1963	May 1963	Apr. 1963	Mar. 1963	May 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					115.9	113.6	117.3	119.4
Fresh & Frozen Fishery Products:					122.4	117.7	123.0	118.1
Drawn, Dressed, or Whole Finfish:					115.4	106.6	121.2	119.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.08	86.2	62.5	91.9	65.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.36	.40	105.9	118.3	122.2	122.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.92	.88	127.5	122.3	132.7	139.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.74	.70	110.4	104.5	100.7	106.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.66	.42	108.1	68.8	113.0	116.3
Processed, Fresh (Fish & Shellfish):					133.9	127.7	125.5	119.7
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.40	.32	95.9	76.5	94.7	80.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.15	1.10	134.8	128.9	125.4	119.6
Oysters, shucked, standards	Norfolk	gal.	8.25	8.00	139.1	134.9	130.7	126.5
Processed, Frozen (Fish & Shellfish):					114.0	114.4	117.3	110.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.9	97.6	97.6	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.35	.34	102.6	99.7	108.5	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.34	117.5	117.5	117.5	110.4
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.02	1.04	120.4	122.8	123.4	116.8
Canned Fishery Products:					104.9	106.8	107.7	122.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.25	24.25	105.7	105.7	107.9	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.25	11.75	99.9	104.4	104.4	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.90	5.90	2/100.0	2/100.0	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.06	9.06	116.2	116.2	116.2	164.3

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/One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack No. 1 oval (15-oz.), 24 cans/cs."--and replaced in the fishery products index by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/Based on Calif. sardines and not directly comparable with new subgroup item (jack mackerel) for January-May 1963.

much higher, halibut prices this May were down 13.3 percent. Prices were higher than the previous month for other products in the subgroup--salmon at New York City (up 1.3 percent), fresh round yellow pike (up 57.1 percent), and whitefish at Chicago up 5.6 percent.

Higher prices this May for all products in the processed fresh fish and shellfish subgroup resulted in a 4.9-percent increase from the previous month. As compared with May 1962, the price index for the subgroup this May was 11.9 percent higher. Lighter supplies of fresh haddock fillets at Boston resulted in a 25.4-percent increase from April to May this year, with prices for that product up 19.7 percent from May 1962. Fresh shrimp prices at New York City this May were up 4.6 percent and were higher by 12.7 percent from May last year. Shucked oyster prices at Norfolk increased 3.1 percent from the previous month and were up 10.0 percent as compared with May 1962.

The subgroup price index for processed frozen fish and shellfish was unchanged from April to May this year but was up 3.4 percent from May 1962. As compared with the previous month, the higher May 1963 prices for frozen fillets of flounder (up 1.3 percent) and haddock fillets (up 2.9 percent) were cancelled out by a 2.0-percent drop in frozen shrimp prices at Chicago. There was no change from the previous month in prices for ocean perch fillets but they were 6.4 percent higher than the May 1962 prices. When compared with May a year earlier, prices were higher for all products in the subgroup except flounder fillets.

Canned tuna was the only item affecting the May 1963 canned fishery products subgroup index. The May subgroup price index at 104.9 dropped 1.8 percent from the previous month and was 14.1 percent lower than in May 1962. Lower May prices for canned tuna were the direct result of a sales drop estimated at about 30 percent. Liberal stocks of canned tuna during May bore indications of an imminent marketing problem despite lower 1963 tuna landings, imports, and canned pack than in the 5-month period of the previous year.

May 1963 prices for other canned products in the subgroup were unchanged from the preceding month but were considerably lower than in the same month a year earlier. Stocks of canned pink salmon and Maine sardines were liberal in May and there was also some concern expressed on the marketing of those products.