

TRENDS AND DEVELOPMENTS

California

CLIPPER TUNA AUCTION SALES, AUGUST 24-DECEMBER 31, 1957: Auctioning of raw frozen tuna landed by member clipper (live-bait) vessels of the American Tuna Boat Association was initiated at San Diego, Calif., on August 24, 1957. This is the first time that raw tuna has been sold by auction in California. Prior to this time catches landed by tuna clippers and others were sold at prices generally negotiated on a seasonal basis. From the first auction on August 24 to December 31, 1957, a total of 22,723 short tons of tuna were sold at 24 auctions. The ATA fleet of 97 vessels participated in these auction sales. Five tuna cannery operators in San Diego and San Pedro each made more than one bid and purchase, and 2 additional cannery operators purchased one trip each.

Ex-vessel prices ranged from a low of \$230 a ton for yellowfin, and \$190 for skipjack at the first two auctions (August 24 and 28) to a high of \$280 a ton for yellowfin and \$241 for skipjack tuna. Details on ex-vessel prices and sales at each auction during 1957 are shown in the table.

Auction Date	No. of Trips	Quantity		Range of Prices ^{1/}	
		Yellowfin & Skipjack Tuna	Tons	Yellowfin	Skipjack
Aug. 24	40		6,500	230	190
" 28	12		2,000	230	190
Sept. 4	3		500	240-250	200-210
" 11	5		1,000	240-250	200-210
" 18	5		1,544	250-260	210-220
" 25	7		1,165	260-270	220-230
Oct. 2	9		1,662	265-272	225-230
" 9	1		676	270-280	230-240
" 16	4		1,050	260-275	220-241
" 23	1		170	270	230
" 28	5		1,655	260-270	220-240
Nov. 4	2		520	260-270	220-230
" 7	2		450	260-270	220-230
" 13	3		610	260-270	220-230
" 15	1		80	260-270	230
" 18	4		1,100	260-265	220-230
" 27	3		496	255-260	217-230
Dec. 2	3		452	260-270	220-230
" 5	1		220	265-270	225
" 9	6		873	255-270	220-230
" 12	3		-	2/255	2/220
" 16	3		-	2/260	2/220
" 19	2		-	2/255-270	2/215-230
Total	117		22,723	230-280	190-241

^{1/}INCLUDE DIFFERENTIALS PAID FOR LARGE FISH--AN AVERAGE OF \$10 A TON MORE FOR YELLOWFIN TUNA LARGER THAN 12-14 POUNDS AND SKIPJACK TUNA LARGER THAN 7-8 POUNDS.
^{2/}NO SALES WERE MADE AT THESE PRICES BECAUSE THE BIDS WERE REJECTED BY ATA.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, JANUARY 1958, P. 31.

ESTABLISHING SILVER SALMON RUN IN SACRAMENTO RIVER SHOWS PROMISE: The California Department of Fish and Game announced in a January 24, 1958, press release it is well pleased with the count of 6,420 silver salmon making up the Sacramento River spawning run during the fall of 1957. The experimental planting

of yearling silver salmon to establish natural runs in the Sacramento River was begun in 1956. Except for a stray fish, silver salmon were not native to the River.

The run was made up of 2,240 three-year-old fish returning from the plant of 43,025 yearlings made in the spring of 1956 and 4,180 two-year-olds (mostly precocious males known as grilse or jacks) from the plant of 53,503 yearlings made in the spring of 1957.

A total of 5,460 silvers, or 12.7 percent of the number stocked, has now returned over two seasons from the original plant made in 1956. This number includes only fish passing Fremont Weir, near Sacramento, and does not include a considerable number taken in the ocean and Delta commercial and sport fisheries.

Of 900 silvers entering Battle Creek and taken at Coleman Hatchery, 706 were grilse and 194 three-year-olds.

In Mill Creek, site of the original plants of 1956 and 1957, 1,523 silvers were counted. Of these, 759 were three-year-olds and the other 764 were two-year-old grilse. Most of the silvers spawned high in Mill Creek and will be protected on their downstream migration this spring by new screens about to be installed on two major irrigation diversions.

One more plant, under its present three-year program, will be made in Mill Creek in the spring of 1958. Silvers for the experiment are grown to yearling size at Darrah Springs Hatchery.

The Director of the Department of Fish and Game, while expressing himself as well satisfied with the project thus far, said "It is still much too early to state flatly that we have established a silver salmon run. We can not fully evaluate the results of these experiments for another year. But so far we are hopeful."

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OYSTER CULTURE ON LEASED BEDS RULED BY COURT TO BE SIMILAR TO FARMING: In a decision made on December 24, 1957, the Superior Court of California ruled that oyster farming is "agricultural labor." A motion on the part of the State for a new trial was dismissed by the Court. As a result of this decision, the State was ordered to refund \$62,249 in employment insurance payments to a California company engaged in the commercial raising of Japanese oysters on leased beds.

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OYSTER INDUSTRY REVIVED: Not since the times of Jack London and the oyster pirates of San Francisco Bay has there been such bustling activity in the bays of California. Oysters for stews and for serving raw on the half shell are pouring from the fertile bottoms of Humboldt, Tomales, Drakes, and Morro bays.

The oyster industry had declined for some time after the turn of the century until a recent California Fish and Game Commission-sponsored revision of legislation and regulations made possible the rebirth of what has become a new young giant in the State's fisheries.

Rules and regulations governing this industry were revitalized, assuring a practical inspection and planting schedule with a maximum of efficiency and protection, along with safeguards to the anglers and hunters who also use the tidal bays.

For many years the oysters of the State have been protected from the attacks of the oyster drill.

Although oysters grow rapidly in the warm and nutrient-rich waters of California bays, conditions for producing baby oysters are not suitable and the young seed oysters must be imported.

However, the waters off Japan, Washington State, and the Atlantic Coast have the oyster drill as well as the oyster. When either the young oysters, known as spat, or large oysters are imported from these areas great care must be used to prevent the accidental introduction of drills, which is the reason for California's rigid inspection of all plantings.

So far the vigilance in California has paid off, as the drill problem does not exist to cause loss of producing oysters and bottoms.

Production has grown in recent years. In 1948 only 166,000 pounds (in-shell weight) of oysters were harvested. In 1956 6,000,000 pounds were dredged by the rejuvenated industry which is still growing.



FIG. 1 - HEAVY WIRE BASKETS LOADED WITH OYSTERS LANDED FROM THE BOATS.



FIG. 2 - SHUCKING OYSTERS AT MORRO BAY, CALIF. PLANT.



FIG. 3 - PACKING SHUCKED OYSTER MEATS INTO JARS.

Most of California's oyster harvest comes from Eureka, where 250,000 gal-

lons of shucked oyster meats is the goal, a result of an already-planted 28,000 cases of seed oysters.

Local industry in the Eureka area has felt the effect of the production development, with more than 130 people employed there at full capacity. There are more than 200 employed in the oyster industry as a whole.

Much of the increased yield is due to the foresight of two California oyster firms. These firms invested risk capital, time, and energy to prepare the seed beds, construct plant facilities, and develop the market for the harvest that would be forthcoming several years later. Following their example, other smaller firms entered the picture and the industry's production records now speak for themselves.

One of the two original firms has introduced the hydraulic dredge to California, making possible a take of as much as 2,000 bushels during a tide. Oysters are unloaded mechanically, but are opened by hand. The fresh, frozen, and canned products of California's oyster beds are sold throughout the United States.

Another good indicator of how the industry has grown: income from the production tax increased from \$336 in 1955/56 to \$1,335 in 1956/57 (fiscal years). Oyster bed rentals netted \$722 and \$1,071 for the same periods. All costs of inspection are borne by the oyster growers.

It's evident that an early California industry once again is becoming big sea food business, revitalized and all decked out in new techniques. (Abstracted from an article by William Ripley, Assistant Chief, California Marine Fisheries Division, in Outdoor California, December 1957.)



Cans--Shipments for Fishery Products, January-November 1957



Total shipments of metal cans during January-November 1957 amounted to 109,534 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 106,613 tons in January-November 1956. At the end of November principal fish canning operations ended for Maine sardines and salmon. Plants were active in California canning tuna, sardines, mackerel, and anchovies. Some shrimp were canned in the Gulf area, and oyster canning was just getting under way.

Although shipments of metal cans indicate an increase in 1957, the cans were probably shipped on expectations since the actual 1957 canned fish and shellfish packs in most instances were less than in 1956.

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



Chesapeake Bay

VIRGINIA-MARYLAND BIOLOGISTS SEEK YOUNG CROAKERS: Young croakers were being sought in Chesapeake Bay by fishery biologists from the Virginia Fisheries Laboratory at Gloucester Point, Va., and the Chesapeake Biological Laboratory, Solomons, Md., early in January 1958. Staff members from both laboratories sampled the fish that live in the Bay in winter with an experimental trawl. The

net was fished at seven-mile intervals from the Virginia Capes up the Bay into Maryland waters and was halted 15 miles above Baltimore by ice.

This cooperative study was made possible through the facilities of the M/V Pathfinder, the new research vessel of the Virginia Fisheries Laboratory. It is the second occasion on which Maryland and Virginia scientists have worked together and they plan to continue the surveys four times each year--winter, spring, summer, and fall.

"The lower part of the Bay is almost devoid of fishes at this time of year," the vessel's Captain reported. "Few fish other than sticklebacks, pipefish, silversides, and anchovies appeared in our trawl, and these were in water 50 to 60 feet deep. In summer, these fish are more abundant in the shallow waters of the Bay and rivers."

In the upper part of the Bay, scientists found numbers of small croakers and striped bass. Some bass weighing up to two pounds were tagged to discover their winter wanderings.



VIRGINIA'S FISHERIES RESEARCH VESSEL PATHFINDER.

Later in January the Pathfinder was used by the Virginia Fisheries Laboratory staff to check the York River for young croakers from its mouth to fresh waters. Information from these cruises, collected and tabulated over a period of several years, will form the basis on which fishery biologists may predict future catches.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE: December 1957: Purchases of fresh and frozen fishery products for the use of the Armed Forces in December 1957 amounted to 1.8 million pounds (value \$903,000). They were purchased by the Military Subsistence Market Centers. In quantity that month's purchases were 28.0 percent greater than in November, but were 13.5 percent less than in December 1956. The value of the purchases in December 1957 were 31.6 percent higher than the preceding month and 17.4 percent lower than in December 1956.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers (December and 12 Months 1957 with Comparisons)

QUANTITY					VALUE				
December		Total			December		Total		
1957	1956	1957	1956	1955	1957	1956	1957	1956	1955
(1,000 Lbs.)					(\$1,000)				
1,756	2,031	23,452	26,610	24,989	903	1,093	12,080	13,413	10,929

Prices paid for fresh and frozen fishery products by the Department of Defense in December 1957 averaged 51.4 cents a pound, practically the same as was paid in November 1957, but 2.4 cents less than the 53.8 cents paid in December 1956.

Year 1957: For the 12 months of 1957 purchases of fresh and frozen fishery products totaled 23.5 million pounds, valued at \$12.1 million--10.0 percent lower in quantity and 9.9 percent lower in value than for the 12 months of 1956.

The over-all average price paid for fresh and frozen fishery products in 1957 was 51.5 cents a pound as compared with 50.4 cents in 1956 and 43.7 cents in 1955. As compared with 1956, prices were generally higher in 1957 for all types of fillets and shrimp, for oysters about unchanged, and for sea scallops lower during the latter half of the year. Those fishery products account for a large percentage of the fresh and frozen fishery products purchased for the use of the Armed Forces.

CANNED FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE:
December 1957: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during December 1957.

Year 1957: Canned fishery products purchases for the Armed Forces for the 12 months of 1957 amounted to about 6 million pounds, 5.2 percent less than the 6.4 million pounds purchased in 1956, but higher by 3.5 percent than the 5.8 million pounds purchased in 1955.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers (December and 12 Months 1957 with Comparisons)^{1/}

Product	Quantity					Value ^{2/}
	December		Total			Dec. 1957 ^{3/}
	1957	1956	1957	1956	1955	
 (1,000 Lbs.)					\$1,000
Tuna	490	3/	2,711	3,334	2,906	240
Salmon . .	-	3/	3,111	2,798	2,785	-
Sardine . .	22	3/	215	236	143	7
Total . .	512		6,037	6,368	5,834	247

^{1/}DATA FOR 1957 ON BASIS OF AWARDS; PRIOR YEARS BASED ON ACTUAL DELIVERIES.

^{2/}VALUE AVAILABLE FOR DECEMBER 1957 ONLY.

^{3/}PURCHASES BY MONTHS PRIOR TO 1957 NOT AVAILABLE.

NOTE: (1) SOME LOCAL PURCHASES ARE NOT INCLUDED. ACTUAL TOTAL PURCHASES ARE HIGHER THAN INCLUDED SINCE IT IS NOT POSSIBLE TO OBTAIN LOCAL PURCHASES.

(2) SEE COMMERCIAL FISHERIES REVIEW, MARCH 1957, P. 17.



Fish and Wildlife Service

ANNUAL REPORT LISTS ACCOMPLISHMENTS:

The double task of conducting "business as usual" and undergoing a major reorganization as directed by the Congress is detailed in the report of the United States Fish and Wildlife Service, Department of the Interior, for the year ending June 1957. The report shows that the changeover from the old organization to the new had developed the following:

The Bureau of Commercial Fisheries with four divisions--Administration, Biological Research, Industrial Research and Services, and Resource Management, with a field organization of five regional offices and a Pacific Oceanic Fishery Investigations Office; responsible for matters relating to commercial fisheries, whales, seals, and sea lions.

The Bureau of Sport Fisheries and Wildlife with four divisions--Administration, Sport Fisheries, Wildlife, and Technical Services, with a field organization of six regional offices; responsible for

matters relating primarily to migratory birds, game management, wildlife refuges, sport fisheries and sea mammals (except whales, seals, and sea-lions).

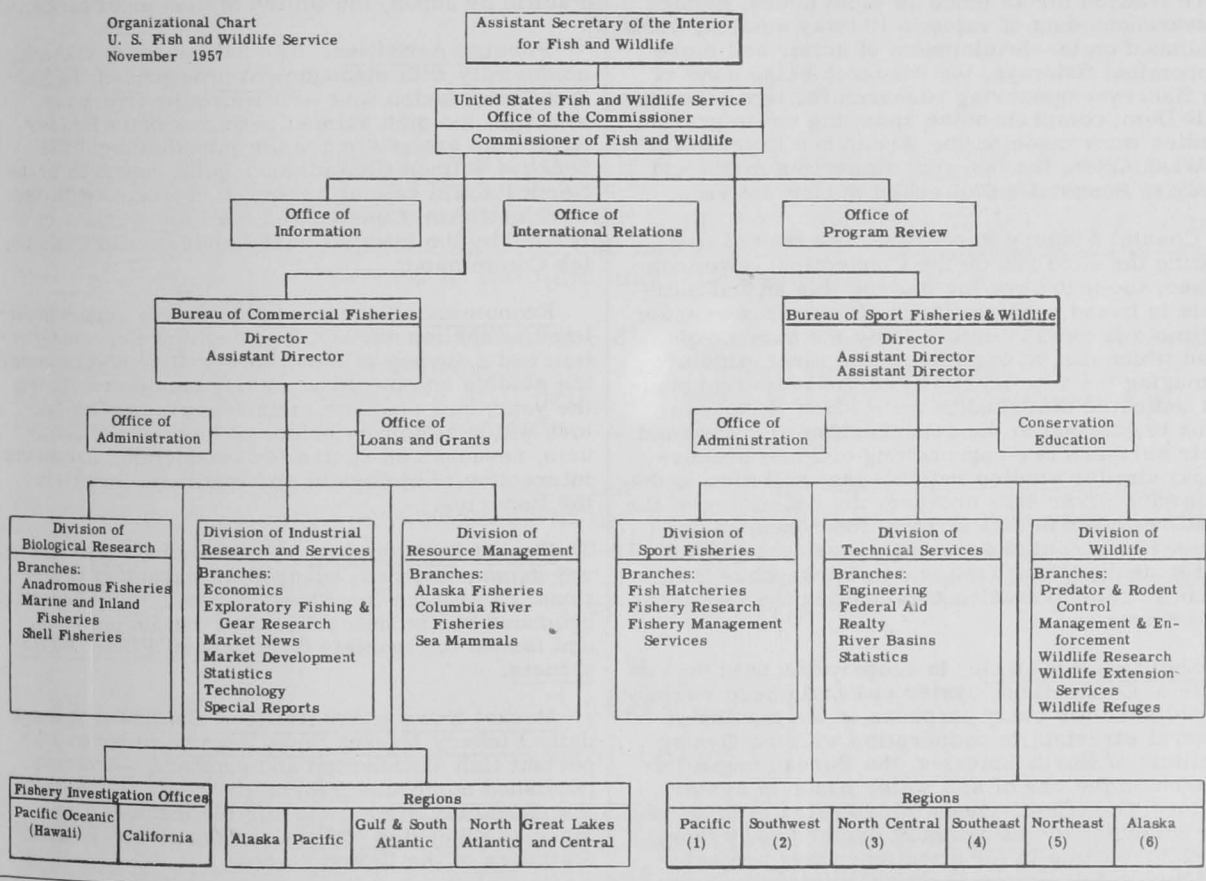
The Office of the Commissioner with coordinating responsibility; includes the following offices: Information, International Relations, and Program Review. The new Service is under the supervision of a Commissioner of Fish and Wildlife and under the general direction of an Assistant Secretary of the Interior for Fish and Wildlife.

Important developments are reported by both operating bureaus. The Bureau of Commercial Fisheries got its fishery loan program under way and by the end of the fiscal period had applications which totaled more than the \$10,000,000 made available by the Congress; announced success in its several years of experimenting to find a selective poison which would kill sea lamprey larvae but not injure larvae of desirable species of fish; reported an increase in the volume and value of the Alas-

fishery products in 1956; showed definite proof of the value of the haddock regulations which the Northwest Atlantic Fisheries Commission established in 1953; saw its exploratory work on royal-red shrimp off the South Atlantic Coast become the basis for a commercial shrimp industry, and its exploratory fishing and gear research program become the forerunner for a commercial shrimp industry off the coast of the State of Washington; found a new market for the Alaska cocktail shrimp in Chicago and a market for the Pacific Coast's Dungeness crab in Florida; developed a market in the pet-food industry in the mid-West for the underfertilized fish taken from the Great Lakes; reported contracts with 32 of the Nation's leading research centers for fundamental studies which will mean better utilization of fishery products and better customer satisfaction with those products; and reported continued progress in the field of quality standards for fishery progress; refined

development projects; devoted considerable study to bird and animal pests and pesticides, on one hand trying to discover ways by which the farmer can get the protection he needs without disaster to fish and wildlife and on the other hand seeking ways to control rodents and birds which are nullifying efforts to reforest parts of the Northwest and Southeast and sections of the country; reported increased cooperation between the states and the Service in waterfowl studies and in mourning dove studies; acquired 14,194 acres of land for wildlife refuge purposes, with an additional 24,000 acres pending; worked with the Air Force on plans for a big fish and game conservation program on Air Force reservations; aided the Navy program to manage renewable resources on all lands under the control of the Navy and Marine Corps; arrested or helped arrest 4,790 persons for violation of State fish and game laws; climaxed a two-year probe by arresting 53 market hunters on the Texas waterfowl

Organizational Chart
U. S. Fish and Wildlife Service
November 1957



the collection of Market News information; and developed the collection of shrimp statistics in the Gulf of Mexico.

The Bureau of Sport Fisheries and Wildlife declared that waterfowl habitat in some areas was becoming critical because of the conversion of choice marshland to rice fields and orchards and because of the destruction of coastal areas by inter-coastal canals and by sulphur and oil prospecting; reported a ten percent increase in hatchery-trout production over the previous year; issued 340 reports on fish and wildlife aspects of proposed water

marshes; brought in 1,035 new cases into Federal courts exclusive of Alaska and had 1,186 cases terminated with a total of \$60,434 in fines and 1,615 jail days.

The report lists in some detail the various activities of the Bureau of Commercial Fisheries in such categories as exploratory fishing and gear research, technological research, economics, market development, statistics, market news reporting, fishery biological research of various kinds, and management and research on Alaska and Columbia River salmon and Alaska fur-seals.

Alaska: In 1956 products of the Alaska fishing industry, including fur-seal byproducts, totaled 226 million pounds with a wholesale value of \$93 million, compared with 186 million valued at \$70 million in 1955. There was an increase of nearly 30 million pounds in the salmon production over 1955, with an increase in value of more than \$21 million. The scope of the research program was doubled as compared with the year before, with special emphasis on numerous salmon problems. There was also an increase in the harvest of sealskins because of the necessity of bringing the Pribilof Islands seal herd into conformity with the carrying capacity of the islands. A convention for the protection of North Pacific fur seals was concluded on February 9, 1957, with Canada, Japan, and the U. S. S. R.

Salmon Research: Northwest salmon studies--work continued on electrical methods of counting and guiding fish; the use of the electrical fish counters was extended; salmon bearing sonic tags were tracked for as much as eight hours, giving researchers data of value in fishway studies; work continued on the development of better and more economical fishways, the research being done at the fishery-engineering research facility at Bonneville Dam; comprehensive spawning and migration studies were made on the Wenatchee River basin in Washington; the ten-year fingerling migration study at Bonneville Dam ended during the year.

Coastal Fishery Research: The task of estimating the shad run on the Connecticut River continued; the technique for making this annual estimate is based upon research of former years; the estimate is used in determining the number of shad which can be taken from the river without damaging the reproductivity of the resource; studies indicated that shad in the Hudson River continue to respond to the conservation practices and their numbers are approaching original proportions; similar studies indicate that pollution in the Delaware River still prevents the rebuilding of the shad resource in that stream; the research on striped bass continued in the Albermarle Sound and Roanoke River area and in Chesapeake Bay; Atlantic salmon studies continued in the Sheepscot River area.

Shellfish Research: In cooperation with the State of Connecticut, oyster spawning beds were established for study purposes at the mouths of several streams; in cooperation with the Oyster Institute of North America, the Bureau began research on the use of salt water ponds in oyster culture; the effectiveness of oyster rafts in keeping commercial quantities of oysters away from predators came in for attention; other projects utilized radioisotopes in shellfish biological research; control methods on green crabs, predators on soft clams, and drills (predators on oysters) were investigated and success in control was achieved.

Inland Fishery Research: Conducted numerous studies on cultural and nutritional problems; further work was done regarding the vitamin needs of chinook salmon; a general study of Lake Erie fishery resources was conducted during the year; discovered two selective poisons which would destroy sea lamprey larvae without harming desirable species of fish, the discovery following sev-

eral years of work including the testing of 5,000 chemicals.

Marine Fishery Research: Underwater television proved to be a practical tool for researchers studying the capture, behavior, and escapement of fish through trawl meshes; studies continued on cod, haddock, ocean perch, and halibut; ocean perch were successfully tagged for the first time and returns from the 3,385 tagged fish is already beginning to yield needed information on age, growth, migration, and mortality; migrations of shrimp over a period of several months can finally be studied because identification of test stock can be made by coloration induced by immersion in a dilute solution of riboflavin or feeding food stained with certain dyes; answers to the sudden fluctuations of Pacific sardine stocks are still being sought; numerous tuna studies were made and the Service participated in a comprehensive oceanographic survey of central and western equatorial Pacific by Japan, the United States, and France.

Foreign Activities: The halibut catch taken in conformity with management practices of the Halibut Commission was well above the five-year average; the pink salmon resource of the Fraser River was brought under the jurisdiction of the Sockeye Salmon Commission; joint research of the North Pacific salmon resource continued with the work of Japan, Canada, and the United States correlated by the International North Pacific Fisheries Commission.

Economics: Transportation rates, import problems, a shrimp survey, household preference studies, and a survey of insurance problems were among the studies completed or nearly completed during the year; new projects included research on factors which affect the prices of key fishery products, research on controlled production, and on the interaction of biological and economic forces in the fisheries.

Market Development: Presented 244 fish-cookery demonstrations, engaged in marketing promotional campaigns in cooperation with the industry; produced two industry-financed motion pictures, and issued the monthly Commercial Fisheries Abstracts.

Market News and Statistics: Continued to issue daily Fishery Market News Reports in seven important fish distribution and production centers; published numerous information news items and statistical bulletins including the monthly Commercial Fisheries Review and the annual Fishery Statistics of the United States.

Technological Research: Contracts which have been awarded to 32 of the Nation's leading research centers include improved utilization, quality and standardization and preservation by radiation studies; methods to prevent discoloration of canned tuna were developed; the use of menhaden oil in leather processing was extended.

The activities of the Bureau of Sport Fisheries and Wildlife are detailed under such categories as Federal aid to States, river basin studies, wildlife refuges, game management, inland fisheries, wildlife research and predator and rodent control.

River Basin Studies: Issued 340 reports on proposed water development projects, including 135 sponsored by the Corps of Engineers, 30 by the Bureau of Reclamation, 65 requiring Federal power license, and 102 small watershed projects; reported wildlife management agreements on 11 water-use projects; listed cooperative efforts for the preservation of anadromous fish runs in the Columbia River basin, on the Rogue River, and on several streams on the Atlantic seaboard; recommended against the proposed Wood Canyon Dam in Alaska; continued studies on the effect of the proposed Narragansett Bay hurricane barrier on the fishery resource of that region.

Inland Fisheries: Operated 92 hatcheries and distributed 24 species of trout, salmon, and warm-

water fish; proceeded with hatchery construction, stream development, and fishery investigation plan for the Columbia River in cooperation with the States of Washington, Oregon, and Idaho; listed six new hatcheries and one major replacement authorized by Congress; also listed 14 other hatcheries in the course of construction or repair, as authorized by Congress; planted nearly five million catchable-size fish; listed special plantings in two States which had experienced severe fish kills; introduced a Mexican warm water rainbow trout into the Southwest; conducted nutrition and disease studies; reported that Federal pond-fish production was at a high level but could not meet the demand for pond fish induced by the ending of the drouth in many areas; emphasized the need for more trout production created by the cold water reaches in the rivers below large dams.



Fisheries Loan Fund

LOANS TO JANUARY 16 AMOUNT TO ALMOST \$5.2 MILLION: Fishery loans granted up to January 16, 1958, amounted to \$5,161,434, slightly more than half the \$10,000,000 revolving fund provided by the Congress, the Department of the Interior reported January 28. More than \$100,000 has been collected in principal and interest. This money is returned to the fund and is available for loans.

Loans have been made on 190 of the 357 applications received. They have been denied on 82 applications totaling \$2,101,293. Total requests to date amount to \$13,500,088. Applications are still being accepted and processed because some earlier applicants have asked for deferral of their requests.

The U. S. Bureau of Commercial Fisheries administers the fisheries loan fund. This fund was provided by Congress in the Fish and Wildlife Act of August 8, 1956. The money is available for operation, maintenance, replacement, repairs, and equipment of fishing vessels and gear and for research in the basic problems of fisheries. The first applications were received in October 1956.



Great Lakes

PROBLEMS OF CONTROLLING FRESH-WATER FISH POPULATIONS DISCUSSED: Fishery administrators, managers, and research workers from Minnesota, Wisconsin, and Michigan discussed methods of controlling lake fish populations at the January 15-16, 1958 meeting of the Tri-State Fisheries Conference at Higgins Lake, Mich.

Among the more than 100 persons participating in the conference were representatives of the U. S. Fish and Wildlife Service, the Great Lakes Fishery Commission, and the University of Michigan.

Panels representing the participating agencies reviewed the role of both toxic chemicals and predator fish in ridding lakes of unwanted fish species and overcrowding. Reduction of undesirable species and excessive fish populations is a vital part of management programs aiming at better growth of game fish species.

Fishery biologists of the U. S. Fish and Wildlife Service discussed development of a specific toxicant which kills sea lamprey larvae with little damage to other fish. Conference delegates agreed that this development pointed up the need for research aimed at discovery of additional specific toxicants to handle various fishery problems.

A chemical might be developed, for example, which would kill only certain undesirable species. Such a toxicant would be of great value in both lake and stream management. Also desirable is a chemical which would act on the young only--enabling fish workers to reduce excessive populations in a lake without harming larger, adult fish.

With hope that control of the sea lamprey is in sight, conference participants reviewed plans for hatchery production of lake trout to speed the build-up of depleted stocks. Reintroduction of lake trout in the Great Lakes would be attempted as soon as the lamprey problem is solved.



Great Lakes Fishery Investigations

SURVEY OF FISH POPULATIONS IN LAKE ERIE COMPLETED FOR 1957 (M/V Cisco Cruise 10): The survey of fish populations in Lake Erie was completed for 1957 when the final cruise (November 5-19) of the season was made by the U. S. Bureau of Commercial Fisheries research vessel Cisco in the eastern basin of Lake Erie. Fishing operations were hampered considerably by continuous stormy weather.

Bottom trawling was done in 2 areas off Erie, Pa., and one area near Long Point, Ontario. Smelt were the only fish caught in any numbers in the trawls. Practically all the smelt were yearlings; they were taken at the rate of about 1,000 per 15-minute tow off Long Point, but were not nearly so numerous off Erie. They seemed to be equally abundant at all depths trawled, from $3\frac{1}{2}$ to 10 fathoms, off Long Point. Smelt older than yearlings in these areas were not as abundant as they had been during the summer. Other species caught in the bottom trawls included alewife, whitefish, white sucker, spottail shiner, emerald shiner, burbot, trout-perch, white bass, yellow perch, johnny darter, sand darter, sheepshead, slimy muddler, and spoonhead muddler.

A British Columbia midwater trawl was tested just north of Long Point, in cooperation with the Ontario fisheries research organization. Bad weather prevented a search for fish concentrations, but the trawl seemed to spread very well and could be handled fairly efficiently using the Cisco's equipment. Only very small catches were made.

A gang of experimental nylon gill nets (graded mesh sizes $1\frac{1}{2}$ - to 4-inch) was set on the bottom in 33 fathoms off Long Point, and nearby another gang ($2\frac{1}{2}$ -inch mesh) was set obliquely from top to bottom in 27 fathoms (both gangs were overnight sets). The bottom net caught 62 smelt (57 were yearlings), 2 yellow perch, and 20 lake herring. The 20 lake herring represented the largest catch of this species taken this year. The males appeared ripe, but the females were not.

The oblique net contained 108 yearling smelt, scattered at all depths but most abundant near the bottom--5 adult smelt near the bottom. Three yellow perch, 3 sheepshead, 2 alewives, and 1 lake herring were caught at midlevels.

No thermal stratification remained even in the deepest portion of Lake Erie. Surface water temperatures of the open lake were generally around 10° C. (50° F.),

and were somewhat lower near shore. The maximum recorded was 11.9° C. (53.4° F.) and the minimum 3.3° C. (35.0° F.), the latter temperature recorded near the mouth of the Lynn River at Port Dover, Ontario.

NOTE: FOR THE SCIENTIFIC NAMES OF THE SPECIES MENTIONED SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1957, P. 20.



Groundfish Fillets

UNITED STATES PRODUCTION AND IMPORTS, 1939-57: Since 1954 there has been a steady decline in the United States production of groundfish fillets (cod, haddock, hake, cusk, pollock, and ocean perch) fillets and blocks. On the other hand, United States imports of groundfish fillets and blocks have climbed steadily from 47.3 million pounds in 1949 to a record 141.3 million pounds in 1957.

Year	U. S. Production (1,000 Lbs.)	U. S. Imports	Year	U. S. Production (1,000 Lbs.)	U. S. Imports
1957	1/ 95,000	1/141,292	1947	115,507	35,093
1956	2/107,138	2/138,714	1946	126,730	49,260
1955	105,633	130,068	1945	126,372	43,169
1954	122,385	137,548	1944	108,754	24,546
1953	112,280	89,706	1943	87,269	16,323
1952	132,642	107,401	1942	105,420	16,674
1951	148,786	87,639	1941	122,790	9,931
1950	136,572	64,800	1940	91,438	9,740
1949	140,078	47,322	1939	99,456	9,426
1948	137,758	53,964			

1/PRELIMINARY. 2/REVISED.

NOTE: ALSO SEE P. 33 OF THIS ISSUE.



Maine Sardines

CANNED STOCKS, JANUARY 1, 1958: Distributors' stocks of Maine sardines totaled 230,000 actual cases on January 1, 1958, considerably less (117,000 cases or 34 percent) than the 347,000 cases on hand January 1, 1957. Stocks held by distributors on November 1, 1957, amounted to 298,000 cases, and on July 1, 1957, totaled 212,000 cases, according to estimates made by the U. S. Bureau of the Census.

Type	Unit	1957/58 Season		1956/57 Season				
		1/1/58	11/1/57	7/1/57	6/1/57	4/1/57	1/1/57	11/1/56
Distributors	1,000 Actual Cases	230	298	212	230	295	347	388
Canners . .	1,000 Standard Cases ^{1/}	1,111	1,337	895	416	465	879	1,016

^{1/}100 3 1/4-OZ. CANS EQUALS ONE STANDARD CASE.

Canners' stocks on January 1, 1958, of 1,111,000 cases (100 3 1/4-oz. cans) were 232,000 cases or 26.4 percent more than the stocks held on January 1, 1957. But there was a decrease of 226,000 cases (14 percent) between November 1, 1957, and January 1, 1958.



Maryland

OYSTER SET IN 1957 SPOTTY: Each year biologists of Maryland's Chesapeake Biological Laboratory measure the season's oyster set by two methods. Clean shells in small chicken-wire bags are placed overboard at various points and changed about once a week. The shells are then examined under a microscope and the number of oyster spat that have attached during the period of exposure are counted. The information from this method shows when the young oysters set and also how many would attach to clean shells placed in the water at that time. After all setting has ended in the fall, samples of natural cultch and of shell plantings from bars all over the State are taken up by regular oyster gear and the number of spat per bushel counted. This second method gives the actual addition of young oysters each year on the natural rocks, and the number of young oysters per bushel of shells that have been contributed by the regular shell plantings.

The number of spat observed on fixed cultch after the end of the setting season always is much less than the number found attached to the clean shells that are changed weekly. There are a number of obvious reasons for this. Natural cultch or shells that have been on the beds throughout the season accumulate a multitude of other living creatures such as barnacles, mussels, sea squirts, networks of *Bryozoa* or tiny "Moss Animals," and many others. Silt or mud also may accumulate in a thick layer over many of the shells. All of these leave much less of the clean shell surface that is needed for attachment of the oyster spat. Also the rapid growth of the other living creatures attached to the shells may crowd out and kill the very young oysters which are less than the size of a fly speck when they first attach. Crowded young oysters may even smother out one another when very thickly set. Certain predators, especially young oyster drills, feed upon and destroy many of the young thin-shelled oysters.

On the test shells exposed in wire bags, the time of setting in 1957 was found to be quite variable. The first spat was found attached about June 1, 1957, near the mouth of the Manokin River. However, the first general period of setting occurred there and in Holland Straits, Hooper Straits, Honga River, Punch Island Bar, and Smith Creek commencing shortly after the middle of June and generally ending during the first week of July. A second wave of setting in these areas occurred during the first half of August, but generally was much less than the early set. In Holland Straits, Hooper Straits, and on Punch Island Creek Bar a third and heavier wave of setting occurred during September and early October. No late setting occurred in the other areas studied except near the mouth of the Patuxent River where a light set occurred in the fall.

Observations of the statewide natural set will not be completed until spring 1958. On the areas thus far examined a very light set of 2 to 16 spat per bushel was found on the head of the Bay bars. From Love Point to Poplar Island the set varied from about 24 to 102 spat per bushel, averaging near 50. On Bay bars above Cove Point along the Western Shore the set was from 0 to 10, near the mouth of the Patuxent 14 to 30, and 4 to 20 in Cedar Point Hollow. Stone Rock and Punch Island Creek Bars on the eastern side of the Bay had counts of 64 and 112, respectively. In the Choptank, sets on natural cultch varied from 0 to 30. The upper Tangier Sound area had sets ranging from 2 to 60 and the lower Sound had mostly no surviving set at all. Natural set in Holland Straits showed 180 spat per bushel. In the Potomac River the set was on most up-river bars with around 20 per bushel from St. Georges to the river mouth. The observations indicate that only the middle Bay along the eastern side has average to slightly above average sets as compared to their past records, while the other areas examined were below their average. Most of the tributaries, where setting usually is higher than in the open Bay, will be examined early in the spring of 1958.



Mollusks

PINK DISCOLORATION OF OYSTERS AND CLAMS STUDIED: The problem of red color in oysters and clams was discussed in January when the Director of the Virginia Fisheries Laboratory, Gloucester Point, met with biologists from other marine Laboratories from New Jersey to South Carolina. Although this strange coloration has been appearing infrequently in oysters for many years, it has been much more troublesome and widespread in freshly-shucked clams in Maryland. Growth of the soft clam fishery to a position of major importance in Maryland has brought this problem to the fore, a January 21 news release from the Virginia Fisheries Laboratory points out.

Scientists believe the color is due to microscopic animals that live in the water. These sometimes become so numerous that they impart a reddish or brownish tint to the water. Some of them carry brilliant crimson pigments which collect in the liver of bivalves. Clams and oysters feed on these and other small organisms, but in cold weather, oysters are less active feeders than clams. A New Jersey biologist has discovered that, through examination of the livers, one may predict whether or not freshly-shucked oysters will exhibit this red coloration.

Oysters may be shucked and packed under the most sanitary conditions and stored under ideal refrigeration, yet the objectionable color may appear after three or four days. Though harmless to man, it makes the product unacceptable to housewives.

In the past two years, outbreaks of red oysters have occurred from New Jersey to Florida. These have usually been of short duration and have occurred in fall or late spring. The Director of the Virginia Fisheries Laboratory stated that "When these tiny colored animals are abundant it is not unreasonable to suppose that oysters filtering water at rates of several gallons an hour would accumulate enough pigment to produce the red liquor we have seen."

The scientists believe these small organisms, called dinoflagellates, do not cause red oysters in winter, since oysters feed seldom, if ever, when the water temperature falls below 50° F. However, there is at least one other cause of pink oysters which has been known for a number of years. This is pink yeast, which infects oysters after they have been shucked. Pink yeast can be eliminated by processing oysters under strictly sanitary conditions.

Packers can avoid serious trouble from reddening caused by dinoflagellates by slicing a sample of fifty oysters and holding them at room temperature. If present, the red color should appear within 24 hours. Packers may learn to "read" the liver of oysters and determine in a very short time whether or not the oysters will turn red after shucking. In this way, they may avoid heavy financial losses by returning the offending load of oysters to a nearby oyster ground until the color disappears.

During periods when red coloration is expected, planters should test samples of oysters from grounds they plan to harvest. If red coloration appears, oysters from these grounds should not be harvested until later samples show they are free of the objectionable color.



North Atlantic Fisheries Investigations

YELLOWTAIL FLOUNDER SAMPLES COLLECTED (M/V T-79 Cruise 20): The fishing grounds about 25-30 miles southwest of No Mans Land Island were sampled for yellowtail flounders during a one-day cruise (January 21, 1958) of the U. S. Bu-

reau of Commercial Fisheries small research vessel T-79. In three drags with a 45-foot head rope otter trawl about 300 yellowtail flounders were caught.



Pacific Oceanic Fishery Investigations

REARING OF TILAPIA FOR LIVE BAIT SHOWS PROMISE: As a result of studies on the part of the Pacific Oceanic Fishery Investigations (POFI) staff on the rearing of tilapia in tanks, a cooperative program was started on the Island of Maui, Hawaii, late in 1957 to provide commercial quantities of this species to the live-bait fishery for skipjack. The major capital investment was provided by a commercial firm, the Territory of Hawaii provided certain services and facilities, and POFI provided supervisory personnel and operating materials. If the program is successful, it should do much to alleviate the chronic bait shortage of the Hawaiian live-bait tuna fishermen. In addition, the success of this program would be a stimulus for others to investigate the possibilities of raising tilapia as a means of easing the bait problem.

Some problems arose concerning the raising of tilapia in POFI rearing tanks late in December 1957. The adult fish showed the effects of an infection caused by an ectoparasite (*Trichodina* sp.), a ciliated protozoan. This infection was observed among the young tilapia early in November. The production of young tilapia decreased from an average of 200 per female per month from June to September as water temperatures began to drop in October to practically zero in December.

* * * * *

RECOVERIES OF TAGGED SKIPJACK TUNA IN 1957: During 1957 the staff of the Pacific Oceanic Fishery Investigations tagged a total of 8,150 skipjack tuna. By the end of the year 966, or 11.8 percent, tagged skipjack had been recaptured. Although few returns were received during the month of December 1957, one interesting recovery was that of a skipjack that had been tagged twice. This fish, first tagged November 20, 1957, was caught and released again on November 23 with a new tag. On December 6 the fish was caught for a third time by a commercial fisherman.



Rhode Island

EXPANSION OF PIER FACILITIES AT POINT JUDITH PROPOSED: The Governor of Rhode Island has proposed an appropriation of \$400,000 to build new piers to accommodate 50 fishing vessels and other facilities at the port of Point Judith. In recent years this port has been growing as a port of landing for fish used in the manufacture of fish meal and oil. The reduction plant now operating in Point Judith plans to build a \$200,000 addition and the fishermen's cooperative expects to invest an additional \$40,000 in cold-storage space.



South Atlantic Exploratory Fishery Program

TRAWLING SPEEDS TRACKED BY RADAR (M/V George M. Bowers Cruise 11) = Radar tracking of commercial shrimp trawlers operating on the Tortugas grounds, for the purpose of allowing accurate determination of trawling speeds, was the objective of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers during Cruise 11 (December 15-22, 1957).

The determination of trawling speed with accuracy of ± 0.05 of a knot is one of the several basic requirements in studies by the Service of design and performance of shrimp trawls. Special instruments for more precise determinations of trawling speed than those used on Cruise 11 will be used in future studies. In addition, it is important to determine trawling speeds of commercial vessels from time to time to permit analysis of factors affecting the catches. A considerable number of observations are needed so that the results may be treated statistically. This work is being greatly facilitated by the cooperation of shrimp vessel operators.

Radar tracks were made of the courses of three vessels (55-58 feet) over varying periods of time. On most legs of these tracks, which were plotted at 5- or 10-minute intervals, speeds were later determined to have been between 3.0 and 3.3 knots. The lowest speed observed, for one 10-minute period, was 2.5 knots; the highest, 3.6 knots. All three of these vessels were towing two (40-42 feet) flat trawls (double-trawl rig).



THE SERVICE EXPLORATORY FISHING VESSEL GEORGE M. BOWERS.

Data on the design, size, power, and fishing gear and catch of these vessels were also obtained. For these latter purposes, an observer was placed aboard the trawlers. Further analyses of the speed data and other information are being made.

Radar tracks of three other trawlers were also made, but the allied data on them was not obtained.

Unfavorable weather forced termination of the cruise on December 21, one day earlier than planned.



South Atlantic and Gulf Fisheries Investigations

FACTORS AFFECTING THE ABUNDANCE OF SHRIMP AND BLUE CRAB STUDIED: Shrimp in the Tortugas area is being sampled by the Marine Laboratory of the University of Miami, under a Saltonstall-Kennedy Act contract with the U. S. Bureau of Commercial Fisheries. Using a chartered vessel, the Marine Laboratory is studying the distribution of shrimp by size, depth, and sex. Results will provide basic knowledge of the distribution, migrations, and growth of pink shrimp on the Tortugas grounds of Key West, Fla. In conjunction with this study, the Bureau of Commercial Fisheries is preparing to conduct large-scale shrimp-marking experiments to determine the rates of growth and mortality and to study the population units in the fishery.

Production of shrimp for bait fell off considerably in Galveston Bay, Tex., during October-December 1957 because of cold weather. Brown shrimp (Penaeus aztecus)

disappeared from the bays, but a small amount of the white shrimp (*Penaeus setiferus*) remained. Whether this is an abnormal situation or not is not known, as the statistical survey of this fishery has been under way only a few months.

A field station for studying the estuarine phase of shrimp biology has been established at Clear Lake, near Galveston, Tex. Sampling stations for shrimp and associated fauna are being set up. Thermometers recording surface and bottom temperatures set up throughout the lake by the Houston Light and Power Company will provide a continuous record of temperature conditions. A plankton trap has been placed at the entrance of Clear Lake to determine when the first small shrimp enter the estuaries. This investigation of the estuarine life of shrimp will provide basic information on the facets of estuarine life which limit successful shrimp production.

The tagging program of the Bureau for blue crabs has been extended into South Carolina, where considerable commercial crab fishing is done. The crab investigation headquarters at Beaufort, N. C., is investigating causes of fluctuations in the supply of crabs, which cause considerable difficulty to the crab processing industry. Laboratory studies are designed to show the effect of varying water conditions on survival of the young crabs. The tagging program will indicate the extent of migration and the rate of capture by the fishery. These two sources of information together should eventually yield a means of prediction and possible control of fluctuations in abundance.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, SEPTEMBER-DECEMBER 1957: Oyster

Research: In order to recheck and confirm observations made on seed oysters for out-of-state shipments, small samples of young oysters from the Ashepoo River as well as the Wadmalaw River were shipped to the Chesapeake Biological Laboratory and to the Virginia Fisheries Laboratory. These oysters will be watched during their life span by biologists at those Laboratories. Will seed oysters from an area of low salinity (Ashepoo River) react differently from those from a high-salinity area (Wadmalaw River) when both are transplanted to an entirely different geographical region?

Fish culturists have been successfully using specific and selective chemicals to control undesirable fish. Preliminary small-scale experiments indicate that at least one commonly-used insecticide can kill certain oyster enemies yet not destroy oysters. After a few more tests, insecticide control of some of the oyster's enemies will be tried on a large scale in one of the acre experimental ponds at Bears Bluff, Progress Report No. 34 (September-December 1957) of the Bears Bluff Laboratories points out.

In July, with funds from the Charleston Scientific and Cultural Educational Foundation, a part of one of the experimental ponds was planted with seed oysters. This planting has thrived and the oysters have now grown to a mean length of 1-7/8 inches, an increase of 3.6 times in length in the 167 days since they were planted. These seed oysters were grown on shell culch and are somewhat crowded. Seed grown on cement-dipped egg crates, even though they are some 40 days younger, are larger. Many individuals of the more than 3,000 measured are now over two inches long.

Meanwhile the growth and mortality of individual oysters, under study since the summer of 1954, is being continued. These oysters experienced relatively low mortality for the first two years of their life. The most rapid period of growth occurred in the first year, but after the second year growth in the Wadmalaw River area, at least, was extremely slow.

Shrimp Research: Analyses of 82 experimental drags at regular stations indicate that white shrimp (*Penaeus setiferus*) are much more abundant during this quarter of 1957 than during the corresponding period in 1956. Generally, however, shrimp reached their peak of abundance a month later this year than last. The season's first hard freeze on December 11 and 12 apparently drove small white shrimp out of the shoal river areas into deeper, warmer waters. There was no indication that the freeze actually killed shrimp, except in the experimental ponds at Bears Bluff.

Survey records show also that the catch per unit of effort for all commercial fish taken in the experimental tows was somewhat below that of 1956. Primarily this was due to the reduced number of spot taken this year. Toward the latter part of December, small spot were beginning to appear in large numbers. Apparently spot are entering the catches three weeks to a month later this year than in 1956. Although whiting catches are almost 50 percent higher this year, summer sea trout and croaker are about equal in abundance.

Offshore exploratory fishing during this quarter was confined to two cruises. In October the Laboratory's research vessel T-19 and the U. S. Bureau of Commercial Fisheries exploratory fishing

vessel *Combat* fished side by side for several days in the 20- to 45-fathom zone. In addition to a normal catch of rock shrimp, spot and croaker were found in large numbers. Over 600 pounds of spot and croaker were taken in one 30-minute drag with the 40-foot experimental net. In November, fishing along the 50-fathom curve east of Charleston gave successful catches of snapper, grouper, and scup (porgy).

On each trip a specimen of the silky shark (*Carcharhinus floridanus*), seldom reported from South Carolina waters, was taken.

Pond Cultivation: The hard freeze of December 11 and 12 killed spot, winter sea trout, anchovies, and shrimp in the salt-water experimental ponds. The minimum air temperature of 18° F. at Bears Bluff was not as low as at the Charleston weather station, but water temperatures in the ponds dropped to 34° F. killing fish and shrimp, but not oysters.

The crop of one of the experimental ponds weighed out at 145 pounds for a 5½-month growing period--from mid-May to November. Little or no attempt was made to manage this experiment. Predators, competitors, and associates--a natural aggregation--were all allowed to enter the pond. Shrimp (299) were dye-tagged and added to the pond during August. Some 8 percent survived. Altogether 23.3 pounds of shrimp were harvested. Since only a few were stocked, most of the shrimp must have voluntarily entered the pond and sur-

vived despite predators. If the fate of the dye-tagged shrimp is a criterion, the potential shrimp recruitment plus growth in a one-acre pond is in excess of 300 pounds. Earlier experimental work at Bears Bluff shows that this potential can be approached but requires careful management.

The two newly-constructed high-land ponds were stocked with shrimp in July and August. In one of the ponds the shrimp were fed chopped grouper steaks three times a week. In the other pond the shrimp were not fed. Neither of these ponds produced a satisfactory crop of shrimp. This may have been due to the "uncured" condition of the ponds which were bulldozed out of a hard yellow clay. It is interesting to note that the shrimp introduced into these ponds rapidly changed color and permanently took on a yellowish cast similar to the substrata. Shrimp in these ponds seemed to have a softer shell than the normal river shrimp. It has been suggested that this was due to a lack of calcium in the pond waters. However, this is difficult to concede since the waters in the pond originally were pumped from a nearby creek, and during the time of the experiment were added to by additional pumpings. Approximately 88 percent of the shrimp stocked in the pond where feeding was carried out did not survive. About 40 percent of the shrimp in the unfed pond survived. This 28 percent difference in mortality rate may not have been due to feeding because a rather catastrophic mortality occurred in the "fed" pond shortly after the pond had been circled by a low-flying crop-dusting airplane.



Saltonstall-Kennedy Act Fisheries Projects

FISHERY PROJECTS FOR 1957: According to a report by the United States Fish and Wildlife Service, activities in behalf of American commercial fisheries during fiscal year 1957 financed with funds provided by the Saltonstall-Kennedy Act of 1954 included studies on many phases of fish production and utilization with special emphasis on:

1. The restoration of the Alaska salmon fishery;
2. New England fishery problems, especially those incident to the longer voyages the fishing fleets must make in search of the product;
3. Derivatives of fish oils which may have industrial uses and might lead to the creation of new industrial products;
4. Development of standards for quality of fishery products;
5. Exploratory and research activities in behalf of the Maine sardine, California sardine, and Alaska herring industries;
6. A search for a better source of seed oysters, better protection against oyster predators, and better methods of handling oysters in the interim from the water to the customer;

7. Explorations of the tuna resources and technological studies on the quality of the canned product;

8. Exploratory and technological work on shrimp;

9. Research on both the Atlantic Ocean and Gulf of Mexico races of menhaden;

10. A program of gear development and improvement;

11. Preservation of fish by radiation;

12. A broad program on marketing which includes education, market development, and market information, and such programs as fishery statistics and economic studies which apply to both production and utilization.

The Saltonstall-Kennedy program is carried out by the Service's Bureau of Commercial Fisheries either by Bureau personnel or on contracts awarded by the Bureau.

The allocation of funds for fiscal 1957 amounted to \$6,595,000, some of it on projects which would extend over a period of at least three years. Of this total allocation, \$3,394,000 was directed toward fishery biological research, \$2,814,000 to-

ward the exploration, development, and utilization of the resource, and \$387,000 for administrative expenses.

Biological research funds were distributed as follows: coastal and offshore research \$2,073,200; tuna research, \$640,000; shell fisheries, \$258,000; Pacific oceanic research, \$227,800; and inland commercial fisheries, \$195,000.

Funds for exploration, development, and utilization of the resource were apportioned as follows: fishery technological studies, \$845,700; exploratory fishing and gear research \$757,300; commercial fishery statistics, \$250,500; economic studies; \$242,000; market news activities, \$101,000; education and market development, \$617,500.

Alaska's fishery, which includes salmon, halibut, herring, king crab, and other species, is the Territory's most important industry. Available data indicate that its fishery products in 1956 were valued at \$110,000,000 while its forest products for that year were valued at \$34,000,000 and its mineral products at \$25,000,000. But despite this, the full potential of its fishery is not being realized. Salmon is by far the most important species of fish caught in Alaskan waters and salmon production is far below what it was 20 years ago.

In 1955 the pack of Alaska salmon was 2,300,000 standard cases, compared with an annual output of 5 and 6 million cases in the 1920's and 1930's. Since Alaska contributes about 10 percent of the total amount of fish caught by American fishermen and about 25 percent of the canned fish produced by American processors, the restoration of the salmon resource is of importance not only to the people of Alaska but to the American consumer.

A total of \$786,500 was devoted to the many problems which beset the fishery in Alaska. Most of this went into salmon research as part of the long-time project of learning just why the salmon resource has dwindled, and to develop ways and means of bringing it back. In addition to this another \$90,000 was allocated to the major salmon study which is being made under the direction of the International North Pacific Fisheries Commission.

The restoration problem is not merely one of allowing an adequate total amount of escapement from the fishermen's nets or lines, for many streams have continued to decline with more than 50-percent escapement. Salmon have a remarkable homing instinct and to realize the full potential of the spawning grounds there must be adequate escapement for each of the many thousand streams.

The Alaska fishery studies include salmon migration research, effects of predators on salmon stocks, effect of logging upon salmon potentials, development of better methods of counting and recording escapement; analysis of data already accumulated. Herring studies include identification of populations and development of predicting abundance. There is also the question of whether or not herring are indispensable to the stocks of coho and king salmon.

Special research is being done on the king crab which is one of Alaska's choice contributions to the

American table. The problem with shrimp, clam, bottom fish, sea scallop, and other potential fisheries in Alaska is that of development. With proper data available fishermen could utilize these resources to make the Alaska fishery more valuable and more stable.

The fact that New Englanders must travel greater distances than formerly and spend more time going to and from fishing grounds has created problems. In seeking solutions the Bureau of Commercial Fisheries has conducted explorations to locate new fishery resources, made freezership economic studies and developed freezership plans to combat time and distance difficulties, tackled the harassing problem of vessel and personal injury insurance costs which take 15 percent of the fisherman's dollar; and conducted numerous biological studies on various species of North Atlantic fish.

For North Atlantic explorations \$311,000 was allocated. The work included investigations with conventional otter trawls and experimental mid-water gear in an area extending from the Gulf of Maine to Georges Bank to a depth of 400 fathoms; discovery of concentrations of commercial-size scallops off Browns and Georges Banks; discovery of schools of bluefin tuna on the New England continental shelf; significant catches of albacore, bluefin, and yellowfin tuna in Gulf Stream waters from Georges Banks to near Bermuda; herring explorations and gear development programs.

To secure the biological data on North Atlantic trawl fishes--sea scallops, flounder, whiting, ocean perch--the sum of \$439,000 was allotted.

Contracts were awarded for comprehensive studies of hull insurance problems and another contract was awarded for the best possible safety program which would prevent injury to the men and at the same time relieve the vessel owner of some of their insurance expense.

Sardine studies were made in widely-separated areas. In the New England area there was \$77,000 allotted for exploratory work on the herring of that region; for the study of the California herring \$118,700 was provided, and for biological research on the Alaska herring there was \$83,900 (already included in Alaska totals).

There was considerable activity on tuna in addition to the work done in the North Atlantic. For a three-year research program in the Pacific Ocean which will be conducted by contract, \$640,000 was earmarked. Another \$60,000 went to contracts to study how to improve methods of freezing skipjack at sea and on improving the quality of canned tuna. In addition, \$227,800 was directed to Pacific Ocean studies which include research on the location of albacore stocks north of Hawaii and additional research on albacore.

There were various studies relating to shellfish. Exploratory work was done on New England sea scallops. There were promising catches of shrimp made in several areas near the Dry Tortugas Islands. Explorations for shrimp are continuing along the continental shelf from Cape Hatteras to Cape Canaveral. Other exploration is being done in deep water in the Gulf of Mexico. Biological studies on shrimp are aimed at answering many

complex questions on spawning seasons, spawning areas, growth rates, distribution, and behavior. This type of information must be available before any valid conservation practices can be inaugurated. For the shrimp biological work there was \$130,000; for the exploratory activity, \$116,000.

The studies on oysters were many and varied, including such items as why the southern oysters lose liquid, what is the optimum salinity for the development of eggs in the Long Island Sound area, what are the best methods for control of predators, and how can the industry give the consumer the best possible oyster product. In addition the king crab and blue crab came in for study.

Saltonstall-Kennedy funds also aided in the continuing process of developing standards for quality fishery products. Fish stick standards have been operating for more than a year and during fiscal 1957 the first notice of proposed quality standards for frozen raw breaded shrimp was published. Considerable headway was made in the development of standards for frozen fish blocks and frozen fish portions, fried or raw; background data were collected on "green" shrimp, blue crab, and fish fillets for use in standards. There was \$277,500 provided for this. Another \$208,000 was provided for various studies, including complex chemical research, on new uses of fish oil and the components of fish oil.

There were numerous economic studies. A survey of public eating places showing the number which did not serve fish or shellfish pointed up a problem area to the industry. A national shrimp survey gave the shrimp industry pertinent facts on its production and distribution program. Other studies pertained to potential inland markets, household preferences in fish products, parity prices and income in the fishing industry, marketing margins, the relative position of the fishing industry in the domestic economy, and the demand and price structure.

Market development and educational activities included: development of markets for underutilized fish, test-kitchen recipes and reports, promotion of the use of fish in the school-lunch program, production and distribution of fishery educational motion pictures, promotion of fishery products through radio and television, special market studies, forecasts of fishery production and supply, and publication of various periodicals and reports.

The statistical program included national and regional compilations and publications.

The report, Research and Activities under the Saltonstall-Kennedy Act, Fiscal Year 1957, is available from the Division of Information, United States Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.



Texas

LICENSE FEE FOR DOUBLE-TRAWL RIGGED VESSELS UNCHANGED: In an opinion handed down by the Texas Attorney General's Office late in 1957, the question of whether a shrimp vessel rigged to tow two shrimp trawls is required to pay for two trawl licenses or a single trawl license was decided. The summary of the opinion states "The Shrimp Trawl License is based on each boat operating or towing a trawl or trawls and not the number of trawls each carries."



United States and Alaska

COMMERCIAL FISHERY CATCH AND CANNED PACK DECLINED IN 1957:

The total United States and Alaska commercial fishery catch was 4.8 billion pounds, or 425 million pounds below the record catch of 5.25 billion pounds in 1956. Slightly more than 300 million pounds of the decrease was in the industrial fish category and approximately 125 million pounds was in food fish. The food fish catch was 2.68 billion pounds and the industrial fish catch was 2.12 billion pounds in 1957.

According to late data compiled by the U. S. Bureau of Commercial Fisheries, the decline in the menhaden catch was responsible for most of the 1957 loss in catch. The catch of menhaden, the principal industrial fish, in 1957 was about 400 million pounds below the record catch of 1956.

The declines in the catches of the following food fish were (in millions of pounds): haddock, 19; salmon, 58; Pacific sardines, 29; tuna, 30; ocean perch, 19. These decreases were compensated partly by increases in the catch of other fish. The species with increases and their gains (in millions of pounds) were: industrial fish other than menhaden, 74; whiting, 24; Maine herring, 14; Alaska herring, 7; jack macker-

erel, 11; Pacific mackerel, 5. The big drop in salmon came in the Alaska area where the catch was down 65 million pounds below 1956. The salmon catch in the Pacific Coast States was up 7 million pounds--the Puget Sound pink salmon run, which occurs only in odd-numbered years, was responsible for this gain.

The total shrimp catch, especially in Louisiana, was lower than in the previous year.

The total canned pack of fish used for human food was 31 million pounds less than the 658 million pounds of 1956.

The pack of Alaska salmon, anchovies, Pacific sardines, and Gulf shrimp was considerably lower than in the previous year while the tuna pack was down less than 0.5 percent.

The Alaska salmon pack of 2,458,000 standard cases was close to the record low of 1955 when only 2,385,000 standard cases were canned. The 1957 decrease was the result of a decline in the runs. The 1957 salmon pack in the Pacific Coast States was 742,000 standard cases, compared with 482,000 standard cases in 1956. The odd-year pink run in Puget Sound accounts for the increase.

The total tuna pack was only slightly lower than in 1956 despite the fact that the Pacific Coast output was down 336,000 cases. An increase of 289,000 cases on the East and Gulf coasts and in the territories brought the tuna pack to 11,787,000 standard cases, close to the 1956 figure. Output of Maine sardines--2,117,000 cases--was down 5 percent while the output of California sardines--471,000 cases--dropped 38 percent.

The total Gulf shrimp pack dropped from 905,000 cases in 1956 to 552,000 cases in 1957. This big decline was due to the failure of the small shrimp (used for canning) to make its appearance in its usual habitat in the Louisiana inshore waters.

United States Fishing Fleet ^{1/} Additions

OCTOBER 1957: During October 1957, a total of 49 vessels of 5 net tons and over were issued first documents as fishing craft--the same number as in October

Table 1 - U. S. Vessels Issued First Documents As Fishing Craft, by Areas, October 1957 with Comparisons

Area	October		Jan.-Oct.		Total 1956
	1957	1956	1957 ^{2/}	1956	
	(Number)				
New England	-	1	17	14	15
Middle Atlantic	-	2	21	23	26
Chesapeake	11	22	93	109	138
South Atlantic	13	14	104	106	119
Gulf	15	6	132	89	100
Pacific	9	3	98	71	76
Great Lakes	-	-	5	2	6
Alaska	1	1	47	40	40
Hawaii	-	-	-	1	1
Puerto Rico	-	-	1	-	-
Total	49	49	518	455	521

^{2/}REVISED.

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

Table 2 - U. S. Vessels Issued First Documents As Fishing Craft, by Tonnage, October 1957

Net Tons	Number
5 to 9	25
10 to 19	4
20 to 29	8
30 to 39	6
40 to 49	4
50 to 59	2
Total	49

1956. The Gulf led all other areas with 15 vessels. The South Atlantic was in second place with 13 vessels, followed by the Chesapeake with 11, the Pacific 9, and Alaska 1 vessel.

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

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, NOVEMBER 1957: United States imports of edible fresh, frozen, and processed fish and shellfish in November 1957 were lower by 32.4 percent in quantity and 30.8 percent in value as compared with October 1957. Compared with November 1956, the imports for November 1957 were up 9.0 percent in quantity and 10.3 percent in value. Imports in November 1957 were much lower than in the preceding month for groundfish and other fillets, dressed and canned salmon, shrimp, tuna in brine, and raw tuna. A rather sharp increase in the imports of fillets and blocks usually follows the month after the beginning of a quarterly quota period. Imports of edible fishery products in November 1957 as compared with November 1956 were higher for shrimp, groundfish and other fillets, and frozen raw tuna.

Table 1 - United States Foreign Trade in Edible Fishery Products, November 1957 with Comparisons

Item	Quantity			Value		
	November	Year	November	Year	Year	
	1957	1956	1956	1957	1956	1956
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish; Fresh, frozen & processed 1/ .	62.5	57.3	786.5	18.2	16.5	231.6
Exports:						
Fish & shellfish; Processed 1/ only (excluding fresh and frozen) .	4.5	9.1	82.8	1.0	2.3	19.2

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

Imports for November 1957 averaged 29.1 cents a pound as compared with 28.8 cents a pound for the same month of 1956.

Exports of processed fish and shellfish in November 1957 were higher by 7.1 percent in quantity, but were down 23.1 percent in value as compared with the previous month. Compared with November 1956, the exports for November 1957 were lower by 50.5 percent in quantity and 56.5 percent in value. The sharp decrease in both quantity and value in November 1957 as compared with November 1956 was due primarily to lack of canned California sardines for export. In November 1956 sardine exports amounted to almost 4.5 million pounds, as compared with about 1.7 million pounds in November 1957.

* * * * *

United States Imports of Groundfish (Including Ocean Perch) Fillets and Blocks

Country of Origin	1/1957	1/1956
	.. (1,000 Lbs.) ..	
Canada	108,308	99,810
Iceland	22,392	27,178
Sweden	-	6
Norway	4,594	4,124
Denmark	3,151	3,010
United Kingdom	77	-
Netherlands	564	480
France	190	919
West Germany	1,240	2,036
Greenland	532	811
Miquelon & St. Pierre.	244	321
Union of South Africa .	-	19
Total	141,292	138,714

1/REVISED IN ACCORDANCE WITH LATEST DATA AVAILABLE. NOTE: THE QUOTA OF GROUND FISH (INCLUDING OCEAN PERCH) FILLETS AND BLOCKS PERMITTED TO ENTER THE UNITED STATES AT 1 1/8 CENTS PER POUND IN 1957 WAS 37,375,636 POUNDS--DIVIDED SO THAT 9,343,909 POUNDS ENTERED AT THAT RATE OF DUTY EACH QUARTER. THE 1956 QUOTA WAS 35,196,575 POUNDS. IMPORTS, DURING INDIVIDUAL QUARTERS IN EXCESS OF THE ESTABLISHED QUARTERLY QUOTA ENTER AT A DUTY OF 2.5 CENTS A POUND. (ALSO SEE COMMERCIAL FISHERIES REVIEW, MARCH 1957, P. 57.)

GROUND FISH FILLET IMPORTS: Year 1957: Preliminary data indicate that 1957 imports of groundfish (including ocean perch) fillets and blocks into the United States reached the record total of 141.3 million pounds--an increase of 2.6 million pounds (2 percent) over 1956. Imports from Iceland and West Germany were down significantly. Canada led all other countries with 108.3 million pounds, or 77 percent of the total, followed by Iceland with 22.4 million pounds, or 16 percent.

December 1957: During December 1957, a total of 7.0 million pounds of groundfish (cod, haddock, hake, cusk, pollock, and ocean perch) fillets and blocks were imported into the United States. Compared with December 1956, this was a gain of 2.7 million pounds (62 percent)--due primarily to more imports from Iceland (up 1.8 million pounds) and Canada (up 656,000 pounds). These two countries

accounted for 93 percent of the December 1957 total. The remaining 7 percent was imported from Greenland, Denmark, France, Norway, West Germany, and the Netherlands.

NOTE: SEE CHART 7 IN THIS ISSUE.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA PROVISIO FOR 1957:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1957 at the 12½ percent rate of duty is limited to 44,528,533 pounds. Any imports in excess of that quantity will be dutiable at 25 percent ad valorem.

Imports under the quota from January 1-December 31, 1957, amounted to 42,513,788 pounds, according to data compiled by the Bureau of the Customs. A total of 2,014,745 pounds of the quota, which could have been imported at the 12½-percent rate of duty during 1957, was not utilized.

The new quota for 1958 has not been announced yet, but from January 1-January 4, 1958, 130,353 pounds of canned tuna in brine was imported into the United States.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-NOVEMBER 1957: Imports of most major fishery products January-November 1957 were significantly higher as compared with the first 11 months of 1956. Groundfish and ocean perch fillets and fish blocks increased 2 percent; frozen tuna, 17 percent; canned tuna in oil and brine, 10 percent; canned bonito in oil and brine, 20 percent; canned sardines in oil and not in oil, 28 percent; fresh or frozen lobster, 6 percent; and canned crabmeat, 9 percent. Canned salmon imports were 11 percent less than the January-November 1956; shrimp imports were about equal; and fish meal imports were 14 percent less.

Exports of principal fishery products during the first 11 months of 1957 were less than in the 1956 period except for canned salmon and mackerel. Canned sardine (not in oil) exports were down 65 percent; and fish oil dropped 17 percent. Exports of canned mackerel were substantially larger than in the 11 months of 1956. Canned salmon exports gained by 37 percent over the 1956 period.

Imports: GROUND FISH: During the first 11 months of 1957, imports of groundfish and ocean perch fillets and blocks totaled 133.3 million pounds or nearly 2 percent more than in the comparable period of 1956. Blocks and slabs were up 27 percent, but ocean perch fillets were down 25 percent. Cod fillet imports were up 2 percent. About 75 percent of the fish fillets and blocks were received from Canada, an increase over the proportion imported from Canada during the first 11 months of 1956. Imports from Iceland comprised 16 percent of the total, a slight decline in their share of the fillet and block imports.

FROZEN TUNA: Imports of frozen albacore amounted to 61.5 million pounds during the first 11 months of 1957, 75 percent more than in the same 1956 period. Imports of tuna other than albacore were 68.8 million pounds, 9 percent less than in the 1956 period. Imports of tuna other than albacore from Peru were up 33 percent, but those from Japan were down 20 percent.

CANNED TUNA: Canned tuna imports totaled 39.6 million pounds through November 1957, an increase of 10 percent. About 986,000 pounds of this quantity were tuna canned in oil. Approximately 94 percent of the canned tuna was imported from Japan.

CANNED BONITO: Canned bonito imports, mostly from Peru, totaled 14.7 million pounds January-November 1957, an increase of 20 percent over the same 1956 period.

CANNED SALMON: Canned salmon imports during the first 11 months of 1957 were 23.5 million pounds, 11 percent less

than in the same period in 1956. The decrease was all in the amount received from Canada.

CANNED SARDINES: Imports of canned sardines January through November 1957 of 22.5 million pounds were 28 percent more than in the comparable period in 1956.

SWORDFISH: Imports of fresh or frozen swordfish totaled 17.7 million pounds during the first 11 months of 1957, about 2 percent less than for the comparable 1956 period.

SHRIMP: Fresh and frozen shrimp imports for the first 11 months of 1957 (62.9 million pounds) showed little change from the similar period of 1956. The quantity imported from the principal supplier, Mexico, was about 13 percent less.

FRESH AND FROZEN LOBSTER: Imports of fresh and frozen lobster and spiny lobster from January-November 1957 were 45.2 million pounds, 6 percent more than in the previous year.

CANNED CRABMEAT: Imports during the first 11 months of 1957 were 5.9 million pounds, a gain of 9 percent as compared with the same period in 1956. Canned crabmeat came almost entirely from Japan.

FISH MEAL: Fish meal imports January-November 1957 of 74,929 tons were 14 percent less than in the comparable period of 1956. Imports from Canada and Norway were less, but those from Peru and Angola increased.

Exports: CANNED SARDINES: During the first 11 months of 1957, canned sardine (not in oil) exports were 65 percent less than in the 1956 period. Exports of canned sardines to the Philippine Republic totaled 4.7 million pounds during the first 11 months of 1957 as compared to 25.2 million pounds in the same period of 1956.

CANNED MACKEREL: Canned mackerel exports during the first 11 months of 1957 were 15.9 million pounds, mostly to the Philippines. The entire 1956 export was only 2.4 million pounds.

CANNED SALMON: Canned salmon exports were 6.5 million pounds during the 11 months of 1957, an increase of 37 percent over the same period in 1956. Most of the increase went to the United Kingdom, the principal country of destination.

FISH OILS: Fish oil exports January-November 1957 were 108.5 million pounds, or 17 percent less than the 1956 period. The decrease was mostly due to smaller shipments to the Netherlands and West Germany.

Vessel Safety

NEW YORK FIRM GETS CONTRACT FOR FISHING SAFETY STUDY: A \$25,000 contract for the development of a vessel safety program for the New England fisheries has been awarded to Ebasco Services of New York City, it was announced January 27 by the Department of the Interior.

The study has the double purpose of providing better safety conditions for the men of the fishing fleet and for the reduction of personal injury insurance costs. It is part of a broad study of the New England fishing fleet insurance problems. The contract was awarded by the Bureau of Commercial Fisheries, United States Fish and Wildlife Service.

Hull and personal injury insurance costs constitute one of the important items of expense in the New England fisheries. A study of hull insurance problems recently has been completed.

The safety study is to be completed in a year. When the program is completed, the Bureau of Commercial Fisheries will submit it to the segments of the fishing industry concerned for their consideration and voluntary action.

Ebasco Services is a firm of engineering consultants with a division which specializes in insurance and safety studies.



Virginia

LEASED OYSTER GROUNDS MORE PRODUCTIVE: For every bushel of oysters produced on natural rocks in Virginia, five bushels are produced on leased grounds. A January 15, 1958, report by the Virginia Fisheries Laboratory at Gloucester Point indicated that less than 1 million bushels of market oysters were tonged from public rocks in 1955, while more than 4 million bushels were dredged and tonged from leased grounds.

Prior to the Civil War some planters began to move oysters from thick crowded beds into open grounds where they grew rapidly and yielded high profits. About 27,000 acres were being cultivated by 1900 and within five years the leased acreage increased rapidly to about 50,000. The period 1905 to 1945 saw a gradual increase in leased bottom up to about 70,000 acres. A phenomenal increase in rented oyster grounds began in 1945. This may have been induced in part by profits made during World War II. The Virginia Commission of Fisheries has encouraged both large and small planters to take up and cultivate suitable bottoms for oyster production. At present the State rents more than 128,000 acres to Virginia planters. By contrast, the smaller yield from public rocks comes from more than 200,000 acres of natural rocks.

The oyster industry of the State will probably depend more and more on production from cultivated grounds unless more money is appropriated for management of public rocks. The key to improvement lies in shell planting and seeding. According to oyster biologists at the Virginia Fisheries Laboratory many public rocks do not receive a consistent set of oyster spat from year to year and, therefore, cannot maintain production at a high level. While private grounds have increased

on a large scale, areas producing seed oysters have not been extended proportionally. Parts of the Corrotoman and Piankatank Rivers could be developed for raising seed, and some private oystermen may produce seed on their grounds.

Shell planting by the Virginia Commission of Fisheries has more than doubled in the past ten years, but at the present rate it would take 73 years to put 200 bushels of shells on each acre of the public grounds. Even if shells were planted only on grounds which would respond well to such treatment (and many acres of public grounds cannot be made productive through shell planting), it would take several decades to plant the minimum number of shells required.

Virginia's oyster industry has remained fairly constant in recent years except for the gradual increase in production from leased grounds, the Virginia Commission of Fisheries reports. The Commission points out that the acreage of leased grounds has not increased in the past two years, for while new acreage has been leased, other loans have been abandoned due to storm damage rendering the ground unfit for continued planting of oysters.

The demand for seed oysters has continued good and the Commissioner has refused to issue permits for out-of-state shipments of seed oysters wherever there has been a demand therefor by Virginia oyster planters. This policy conforms to the statute laws of Virginia. The James River beds continue to produce about 2,000,000 bushels of seed oysters yearly.

Virginia now has 128,217 acres under lease as compared to 26,846 acres in 1900. More oyster

ground is under cultivation than in any other state. The Commission believes that the oyster industry has largely recovered from the severe damage wrought by hurricanes in the fall of 1954 and the summer of 1955.

One of the greatest wonders of the seafood industry is the continued high production of the James River seed beds. The success of spawning, setting, and survival of spat varies, but in the history of the fishery there never has been a failure. This is particularly surprising in face of the large variations in abundance that affect most of the other seafoods in Chesapeake Bay.

The most convenient source of seed outside the James River is an extensive area along the seaside of the Eastern Shore where setting is prolific. Most oystermen are aware that this seed does not survive well when it is transplanted to the Bay, but this information has been obtained by trial and error, and costly experiments undoubtedly will be tried again if the need for seed becomes urgent. Controlled experiments at the Virginia Fisheries Laboratory have confirmed the high mortality rate of seaside seed and have revealed the reasons. The heavy deaths are caused by the fungus *Dermocystidium*, which is prevalent in the Bay, but almost entirely absent from the James River seed beds and the seaside area. James River seed is resistant to infection, and the death rate from fungus is not unduly heavy. Seaside oysters, on the other hand, have little resistance to the fungus, and

by the end of the second summer deaths have been so heavy that only a small fraction of the original oysters remain. Unless the prevalence of fungus in the Bay becomes substantially and permanently reduced, the planting of seaside seed is not recommended.

Another source of seed for Chesapeake Bay is the south Atlantic coast, where in many areas underexploited heavy sets of oysters occur regularly. One such source is the coastal waters of South Carolina. Considerable information has been obtained on the survival and growth of this seed in local waters by growing South Carolina spat to market size in trays suspended from the Laboratory pier. Growth is rapid and quite satisfactory at first, but lags behind the growth of local oysters after about two years. Survival, on the other hand, is much better in summer, for these oysters are highly resistant to infection with *Dermocystidium*. In winter, however, the survival rate is poor, and in cold winters the death rate may be heavy. Yields in terms of bushels of market-size oysters per original bushel of seed seem to be somewhat lower than for local seed, but South Carolina seed is probably superior to seed from the seaside of the Eastern Shore for planting in Chesapeake Bay. It is believed that under normal conditions local seed is best for local planting, but if additional supplies are needed, experiments on a commercial scale with South Carolina seed might be profitable if economic conditions and that State's export regulations are favorable.

* * * * *

REPRODUCTIVE RATE OF OYSTER DRILLS LOWER IN 1957: Reproductive activity of oyster drills slumped amazingly during the summer of 1957, according to a January 29, 1958, news release from biologists of the Virginia Fisheries Laboratory. Oyster drills or screwborers have plagued the oyster industry for years. These small snails, with file-like tongues, drill holes through the thin shells of baby oysters and devour them. So destructive are they on the Eastern Shore of Virginia that the State pays a bounty to have the pests removed from public oyster grounds; \$14,856 was spent for collected drills during the year ending June 1957.

Biologists are patiently gathering information about drills. In the summer of 1957, the biologists discovered that neither of the two kinds of drills living in eelgrass beds in front of the Laboratory were laying as many eggs as they had during the previous summer. Whereas 330 young had been produced in each square yard of bottom sampled in 1956, only 41 were produced in 1957. Had the scientists reduced the breeding population by collecting so many drills? About 80,000 had been removed from the area during the past several years.

Scientists try to watch for changing conditions that may explain the results of their experiments. The biologists had just commenced work in another area down river similar to the bottom where they had been trapping oyster drills in 1956. Although the new plot, never disturbed before, had three times as many large drills on it as the first plot fished in 1956, it, too, produced only 42 baby drills per square yard last summer. Evidently some widespread calamity had befallen these oyster-eaters, drastically reducing their reproductive rate. What was the cause?

"Actually the cause is unknown," the biologist stated. "Future investigations will measure variations in spawning success from year to year and will be planned to reveal the reasons. Eventually, we hope, this knowledge will be used to control these pests, which destroy millions of bushels of oysters every year."



Wholesale Prices, January 1958

During January 1958 the edible fish and shellfish (fresh, frozen, and canned) wholesale price index (122.1 percent of the 1947-49 average) declined 4.6 percent as compared with December 1957, but was up less than one percent as compared with January 1957. Lower wholesale prices for fresh drawn haddock and haddock fillets at Boston and drawn lake trout at Chicago were responsible for the drop in the index from December 1957 to January 1958.

Wholesale prices for fresh and frozen drawn, dressed, and whole finfish from December 1957 to January 1958 dropped 10.4 percent due principally to a 26.2 percent decline in fresh drawn haddock prices at Boston and a decline of 15.4 percent in fresh lake trout prices at Chicago. Prices for frozen western halibut and king salmon increased slightly. In January 1958 the wholesale price index for this subgroup was 3.7 percent below the same month in 1957 because of lower prices for all the subgroup items, except fresh drawn haddock (up 6.1 percent) and drawn whitefish (unchanged).

Fresh processed fish and shellfish prices in January 1958 were lower by 2.7 percent as compared with the preceding month. Lower wholesale prices for fresh haddock fillets (down 16.6 percent) reflected the decline in ex-vessel prices for drawn haddock at Boston. Due to more plentiful supplies of shucked oysters this season as compared to last, wholesale prices showed signs of weakness with a decline of 2.1 percent from December 1957 to January 1958. Prices for fresh 26-30 count headless shrimp remained high and unchanged from



CHUNKS OF FRESH CANADIAN SWORDFISH ON DISPLAY AT FULTON FISH MARKET, N.Y.C.

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

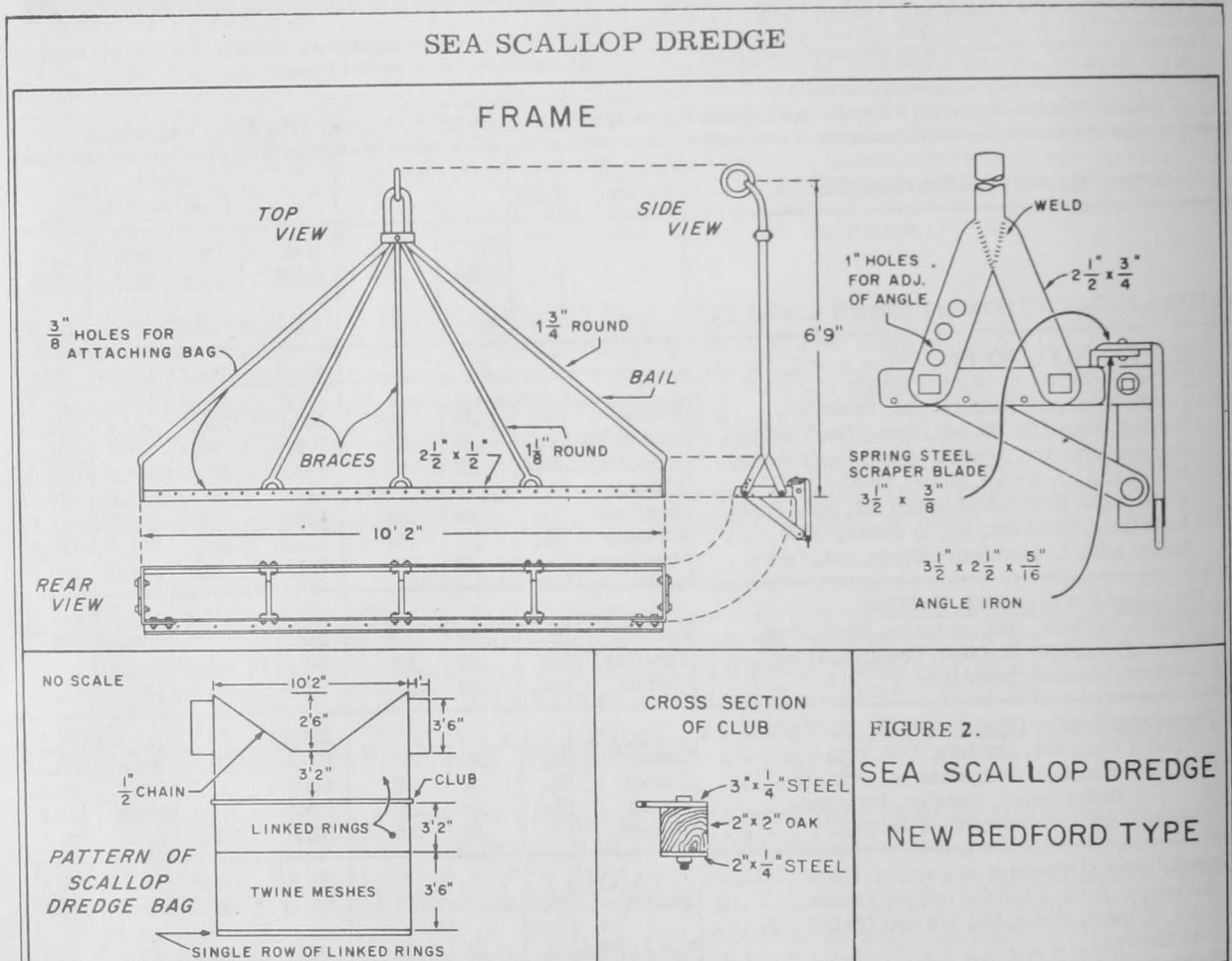
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)						
			Jan. 1958	Dec. 1957	Jan. 1958	Dec. 1957	Nov. 1957	Jan. 1957			
			ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)								122.1
Fresh & Frozen Fishery Products:					137.4	144.8	136.1	136.2			
Drawn, Dressed, or Whole Finfish:					129.2	144.2	130.8	134.1			
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.15	.20	152.3	206.5	142.4	143.6			
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.31	.31	96.4	96.9	96.4	108.3			
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.62	.61	138.8	136.0	143.8	143.8			
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.59	.59	146.3	146.3	142.5	146.3			
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.64	.64	128.4	128.4	156.7	141.5			
Lake trout, domestic, No. 1, drawn, fresh. . . .	Chicago	lb.	.54	.64	110.6	131.1	151.6	116.8			
Yellow pike, L. Michigan & Huron, rnd., fresh . .	New York	lb.	.48	.48	111.4	111.4	114.9	140.7			
Processed, Fresh (Fish & Shellfish):					143.8	147.8	142.2	140.3			
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.48	.58	163.3	195.7	158.2	158.2			
Shrimp, lge. (26-30 count), headless, fresh . . .	New York	lb.	.89	.89	140.6	140.6	138.3	128.8			
Oysters, shucked, standards	Norfolk	gal.	5.88	6.00	145.4	148.5	145.4	151.6			
Processed, Frozen (Fish & Shellfish):					131.2	129.7	125.1	122.7			
Fillets; Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	103.4	103.4	100.8	103.4			
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.38	117.7	117.7	103.6	94.2			
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.20	.29	114.3	114.8	110.8	114.8			
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.85	.84	131.6	128.8	130.0	130.0			
Canned Fishery Products:					100.5	100.8	100.0	101.5			
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	120.0			
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.35	11.50	81.8	82.9	82.9	80.8			
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	9.75	9.60	113.8	112.0	100.4	105.0			
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans cs.	New York	cs.	6.38	6.35	67.9	67.6	68.6	84.6			

^{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.

December 1957. Compared with January 1957, the index for this subgroup in January 1958 was up 2.5 percent because of a 3.2-percent increase in fresh haddock fillet prices and a 9.2-percent rise in fresh shrimp prices; but oyster prices were down 4.1 percent.

Frozen processed fish and shellfish prices increased slightly (1.1 percent) from December 1957 to January 1958 due to an increase of one cent a pound for frozen 26-30 count shrimp at Chicago. Frozen fillet prices were firm and unchanged during the period. From January 1957 to January this year the frozen processed subgroup index was up 6.9 percent, principally because of an increase of about 25 percent in frozen haddock fillet prices and a slight rise of 1.1 percent in frozen shrimp prices.

The canned fishery products subgroup index in January this year was about unchanged (down 0.3 percent) from December 1957 and was down 1.0 percent from January last year. This January canned Maine sardines (up 0.4 percent) showed the first signs of recovery from the unprofitable price that marked the first sales of the 1957 pack, and further changes upward were expected due to a more healthy inventory situation. Wholesale prices for canned Maine sardines this January were still 19.7 percent below January a year ago. Canned tuna prices dropped by about 15 cents a case from December 1957 to January 1958, but were up 1.2 percent from January a year ago. Supplies of canned California sardines (one pound ovals) were about exhausted by the middle of January this year and prices rose.



Details of construction of a typical offshore sea scallop dredge.

--Fishery Leaflet 442, Sea Scallop Boats and Gear, August 1957.