

TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

A total of 61 vessels of 5 net tons and over received their first documents as fishing craft during November 1949—4 less than in November 1948, according to the Bureau of Customs, Treasury Department. Virginia led with 10 vessels, followed by Florida and North Carolina with 7 vessels each. During the first 11 months of 1949, a total of 939 vessels were documented, compared with 1,125 during the same period in 1948

Vessels Obtaining Their First Documents as Fishing Craft, November 1949

Section	November		Eleven mos. ending with Nov.		Total
	1949	1948	1949	1948	1948
	Number	Number	Number	Number	Number
New England	2	6	32	49	52
Middle Atlantic	1	3	42	40	40
Chesapeake Bay	13	6	75	56	59
South Atlantic and Gulf ...	27	37	336	511	541
Pacific Coast	10	7	318	337	348
Great Lakes	3	4	38	46	51
Alaska	4	2	92	77	81
Hawaii	1	-	5	9	12
Unknown	-	-	1	-	-
Total	61	65	939	1,125	1,184

Note: Vessels have been assigned to the various sections on the basis of their home port.



Alaska and Pacific Northwest Exploratory Fishing Vessel Launched

The motor vessel US FWS John N. Cobb was launched January 14, 1950, at a Tacoma, Washington, shipyard, the Secretary of the Interior announced January 12. The John N. Cobb will be used in the waters off the Pacific Northwest and Alaska to explore untapped fishery resources—with special emphasis, at first, on albacore tuna.

The entirely new 93-foot vessel is constructed of wood and is to be equipped with all the latest navigational equipment—including radar, loran, two depth-finding devices, and electro-mechanical steering. An experimental-sized refrigerated hold, bait tanks, brine wells, and all the fishing equipment for seining, long-line fishing and trawling are part of the equipment, as well as some experimental rigs of unorthodox design.

The U. S. Fish and Wildlife Service will commission the vessel in a Seattle ceremony about February 15. After a shakedown cruise and brief test period, the John N. Cobb will sail to Alaskan waters to begin its fishery explorations. Tuna is a relatively new industry in Alaska and the exploratory vessel will investigate the potentialities of tuna in the area.

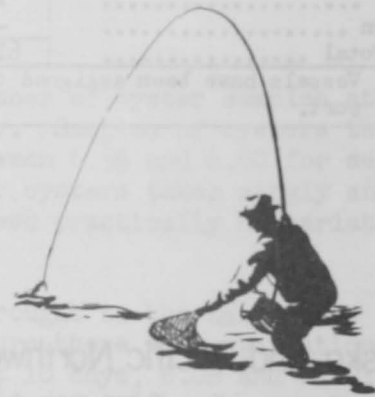
The vessel US FWS John N. Cobb was named after John Nathan Cobb, a foremost fishery expert in the early Bureau of Fisheries, a predecessor organization of the Fish and Wildlife Service. Mr. Cobb, who died in 1930, was also noted for his authoritative books on salmon and the Pacific cod. In 1919, Cobb helped organize, and became first dean of, the College of Fisheries of the University of Washington in Seattle.



Anglers' Fishing License Sales Continue to Increase

FISHING LICENSE SALES - JULY 1, 1948 to JUNE 30, 1949				
STATE	RESIDENT	NON-RESIDENT	TOTAL	FEES PAID BY ANGLERS
ALABAMA	125,017	8,023	133,040	\$ 148,197
ARIZONA	64,336	13,056	77,392	241,878
ARKANSAS	208,334	62,905	271,239	489,986
CALIFORNIA	1,017,305	13,312	1,030,617	3,138,501
COLORADO	257,925	61,704	319,629	1,032,689
CONNECTICUT	73,827	3,789	77,616	311,855
DELAWARE	4,821	1,544	6,365	14,305
FLORIDA	190,145	83,870	274,015	642,823
GEORGIA	170,048	3,274	173,322	335,717
IDAHO	164,706	40,109	204,815	717,199
ILLINOIS	758,203	24,870	783,073	815,903
INDIANA	570,474	39,202	609,676	770,750
IOWA	406,173	13,367	419,540	812,633
KANSAS	221,785	6,861	228,646	345,814
KENTUCKY	280,767	21,699	302,466	311,082
LOUISIANA	63,675	3,140	66,815	95,075
MAINE	119,391	55,316	174,707	576,201
MARYLAND	56,244	13,050	69,294	115,398
MASSACHUSETTS	225,672	6,201	231,873	518,106
MICHIGAN	826,230	283,879	1,110,109	2,102,347
MINNESOTA	647,927	214,895	862,822	1,578,006
MISSISSIPPI	105,439	30,125	135,564	379,433
MISSOURI	556,659	42,450	599,109	1,340,988
MONTANA	169,233	25,170	194,403	600,421
NEBRASKA	222,287	9,390	231,677	326,431
NEVADA	22,331	11,320	33,651	101,239
NEW HAMPSHIRE	92,132	48,012	140,144	463,351
NEW JERSEY	109,064	8,219	117,283	368,487
NEW MEXICO	65,134	31,310	96,444	355,203
NEW YORK	662,805	27,657	690,462	1,884,403
NORTH CAROLINA	189,257	29,503	218,760	547,280
NORTH DAKOTA	51,452	344	51,796	21,522
OHIO	887,876	30,166	918,042	1,033,251
OKLAHOMA	360,204	48,464	408,668	542,136
OREGON	255,849	21,222	277,071	1,064,185
PENNSYLVANIA	592,639	19,038	611,677	1,290,313
RHODE ISLAND	21,821	324	22,145	42,066
SOUTH CAROLINA	129,641	7,497	137,138	179,000
SOUTH DAKOTA	107,115	26,822	133,937	152,199
TENNESSEE	326,974	99,463	426,437	733,465
TEXAS	293,409	5,239	298,648	301,671
UTAH	85,743	4,909	90,652	313,703
VERMONT	77,436	28,424	105,860	256,381
VIRGINIA	242,700	3,035	245,735	480,379
WASHINGTON	383,085	22,591	405,676	1,749,451
WEST VIRGINIA	320,424	17,796	338,220	729,947
WISCONSIN	736,727	285,277	1,022,004	1,732,158
WYOMING	66,783	33,513	100,296	554,412
TOTALS	13,587,224	1,891,346	15,478,570	\$ 32,657,940

Sales of anglers' fishing licenses climbed to a new high of 15,478,570 during the fiscal year ended June 30, 1949, the Director of the Fish and Wildlife Service reported on January 18. The gross revenue of \$32,657,940 derived by the 48 States from the sale of these licenses also broke all records for earlier years.



The 1948-49 season totals show an increase of 1,400,609 in licenses and \$5,333,296 in revenue, compared with the previous year when 14,077,961 licenses were sold by the various States for \$27,324,644.

In the number of licenses issued, Michigan again headed the list, with 1,110,109. California ranked second with 1,030,617, followed by Wisconsin with 1,022,004; Ohio, 918,042; Minnesota, 862,822; Illinois, 783,073; New York, 690,462; Pennsylvania, 611,677; Missouri, 599,109; and Tennessee, 426,437.

California exceeded all other States in revenue received with \$3,138,501. Michigan was second with \$2,102,347, followed by New York with \$1,884,403; Washington, \$1,749,451; Wisconsin, \$1,732,158; Minnesota, \$1,578,006; Missouri, \$1,340,988; Pennsylvania, \$1,290,313; Oregon, \$1,064,185; and Ohio, \$1,033,251.

In Alaska the total fishing licenses sold numbered 26,299--21,481 resident and 4,818 non-resident. The revenue received was \$58,145.

In the Territory of Hawaii, 2,027 fishing licenses were sold for \$9,751.



Chesapeake Bay Institute Research Vessel

In order to study the hydrography of Chesapeake Bay, a new research vessel, Maury, was launched by the Chesapeake Bay Institute on January 20 this year. This Institute is a cooperative venture of Johns Hopkins University, the States of Maryland and Virginia, and the United States Navy.

The Fish and Wildlife Service aided in the formation of the Institute and will continue to consult with it and cooperate in the application of its findings to fishery problems.



ECA Procurement Authorizations for Fishery Products

Among the procurement authorizations for commodities and raw materials announced by the Economic Cooperation Administration during December 1949, there was only one transaction concerning fishery products--\$1,250,000 to be used for the purchase of salted fish from Canada for delivery to Greece.

Since the beginning of the ECA program on April 1, 1948, through December 31, 1949, \$35,211,911 was authorized for fishery products (including fish meal and oils).

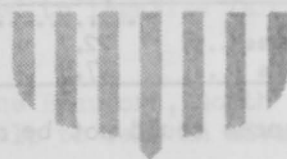
The signing of an Economic Cooperation Agreement between the United States and the Federal Republic of Germany was announced on December 15 by the Department of State. Heretofore, Marshall Plan aid to Germany has been supplied under terms of the two Bilateral Agreements between the United States Government and the Military Governors of the Bizone and the French Zone, respectively. The new Agreement also covers relief supplies (The "GARIOA" aid) heretofore supplied by the Army under a separate appropriation which is now administered by ECA. The total United States dollar aid to Germany during the 1949-50 fiscal year is expected to be about \$730 million. By this Agreement the new German Government also becomes custodian of the so-called "counterpart funds" of Deutsche-mark equivalent which the Federal Republic is required to set aside against all dollar aid it receives from the United States.



FOR EUROPEAN RECOVERY

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Federal Purchases of Fishery Products

DEPARTMENT OF THE ARMY, NOVEMBER 1949: Purchases of fresh and frozen fishery products by the Army Quartermaster Corps during November 1949 for the U. S. Army, Navy, Marine Corps, and Air Force for military feeding totaled 1,429,585 pounds (valued at \$530,647). This was a decline of 13 percent in quantity and 5 percent in value, compared with October 1949; but an increase of 19 percent in quantity and 9 percent in value, compared with November 1948.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (November and totals for 11 months, 1949 and 1948)							
Q U A N T I T Y				V A L U E			
November		January-November		November		January-November	
1949	1948	1949	1948	1949	1948	1949	1948
lbs.	lbs.	lbs.	lbs.	\$	\$	\$	\$
1,429,585	1,196,399	16,042,742	15,384,954	530,647	486,421	5,366,264	5,554,666

For the first eleven months this year, total purchases were 5 percent greater in quantity, but 2 percent less in value, compared with the corresponding period in 1948.



Fishery Biology Notes

NOTES ON THE NORTH ATLANTIC FISHERY INVESTIGATIONS: Haddock: Large differences in the strength of year classes and in age composition on Georges and Browns Banks have been found by the Service's North Atlantic Fishery Investigations working with the research vessel Albatross III out of Woods Hole, Massachusetts.

Length Comparisons of 1-through 5-year Old Haddock on Georges and Browns Bank, 1949					
Bank	1-yr. old	2-yr. old	3-yr. old	4-yr. old	5-yr. old
	(Length in centimeters)				
Georges	22.7	36.6	43.2	49.4	52.4
Browns	17.9	22.4	30.6	41.1	46.4

These differences indicate that hereditary or environmental conditions favoring growth are different in the two areas. Of even more importance, however, is the fact that such large differences

could not be maintained if any important intermigrations had occurred.

These results indicate that each Bank harbors a stock of haddock that is probably largely independent. They substantiate the necessity of the present practice of collecting and analyzing separately statistics of landings, age, growth, abundance, and other biological data for the two areas.

By the end of the past year, ten of the 1,028 haddock tagged since June 1949 on Georges Bank were returned. Of the returns, eight were reported 10 to 20 miles to the north, all along the northern edge of Georges. The other two were reported from the South Channel and Nantucket Shoals, about 150 miles to the west. The fish were out for 23 to 108 days.

No returns have been reported of the 186 that were tagged on Browns Bank, but there has been virtually no fishing on that Bank since the tagging.

Scale samples were obtained and examined from 5 of the 10 fish returned to see if false checks had been laid down at the time of tagging, but none were found. Apparently the tagging method in use does not hinder the haddock's growth too drastically.

Analysis of catches of haddock made during 135 half-hour census tows at 103 stations on Georges Bank and the Southern New England Banks resulted in a minimum estimate of 139 million fish as the size of the 1949 New England haddock stock.

Analysis of Bottom Temperatures: Bottom temperatures in degrees Fahrenheit obtained on Cruises 26 and 27 (July 27 - August 15, 1949) and Cruises 5, 6, and 7 (July 13 - August 25, 1948) of the Albatross III were correlated with the numbers of haddock, whiting, and total fish caught on these cruises. These two groups of cruises, chosen because they covered the same general area of Georges Bank and the Southern New England Banks, were the only ones where a definite area was covered in a relatively short time. The 1949 data showed that the highest catch of haddock, whiting, and total fish per tow occurred at 56 degrees. When the data were broken down into three depth zones of 0-30 fathoms, 31-60 fathoms, and 61-plus fathoms, the peak for haddock, whiting, and total fish remained at 56 degrees, showing that depth of water did not influence results.

In 1948, the majority of tows were made in temperatures below 52 degrees, and very few haddock were caught. Graphs of the bottom temperature versus number of fish showed that more fish were caught at higher temperatures.

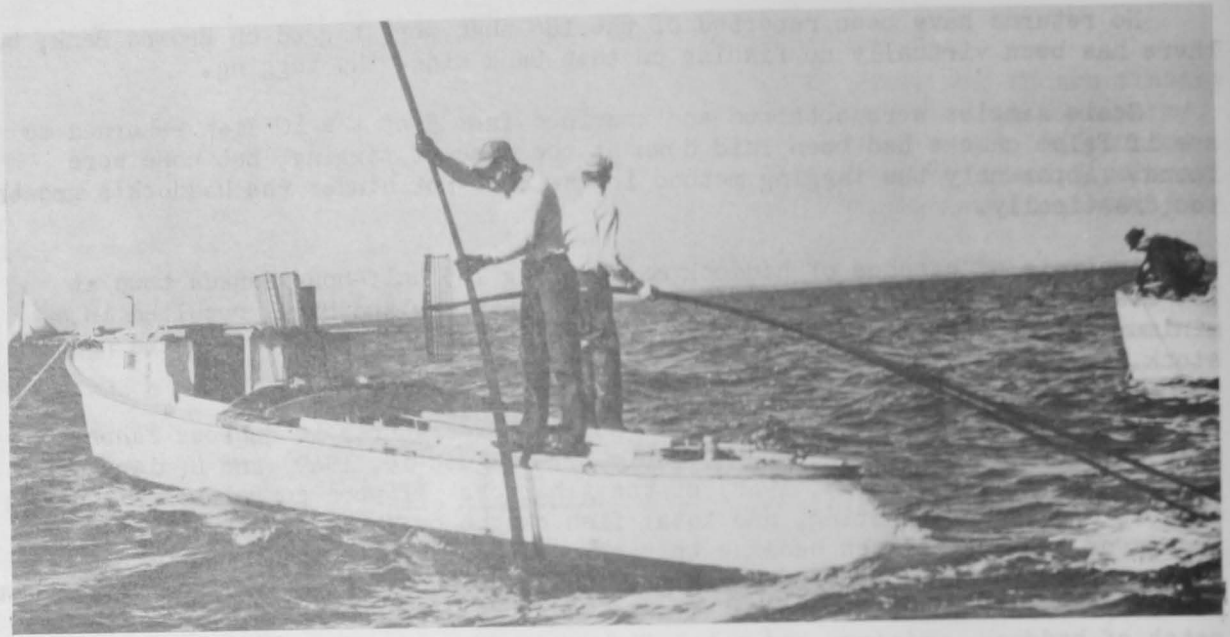
The average bottom temperature in 1948 was about 50 degrees F. and in 1949 was 55 degrees F. More haddock were caught in 1949 than in 1948, and the greatest catches were made in areas where the bottom temperature was highest.

COMMERCIAL CLAM FARMS TO BE TRIED: Tentative plans have been made by the Service to establish experimental commercial hard clam (quahaug) farms in representative areas. Although laws of most States prohibit clam farming, it is believed that when satisfactory farming methods have been developed and commercial practicability has been demonstrated, the laws may be revised to legalize farming.

Studies on the food of hard clams to be conducted at the Beaufort, North Carolina, Laboratory will apply also to this work and may help to tell in advance whether areas are suitable for hard clam farming.

OBSERVATIONS ON GROWTH OF OYSTER SPAT: Observations on growth of spat of O. virginica, (the Eastern oyster) collected last winter and spring under laboratory conditions and then grown in Milford Harbor, were continued. The largest individuals among these oysters measured 5.8 cm. at the end of the growing season.

A comparison of the growth of the laboratory set of O. gigas (Pacific oyster) with that of O. virginica, both species setting at about the same time, showed that in general spat of O. gigas had outgrown considerably that of O. virginica. Most of the O. gigas spat measured between 6.0 and 8.0 cm., several of the largest ones were almost 9.0 cm. These measurements were made at the end of the season when the water temperature was becoming too low for



TONGING OYSTERS IN THE MIDDLE ATLANTIC STATES

growth of oysters. Examination of gonads of O. gigas spat on December 9, when water temperature was below 5.0° C., showed that the majority contained active sperm.

Some O. lurida (Western or Olympia oyster) which set in the Laboratory early in the spring, had grown to about 5.0 cm., thus reaching in one season the size of adult individuals growing under natural conditions on the Pacific Coast.

TESTS ON EUROPEAN OYSTERS IN THE UNITED STATES: The majority of O. edulis (the European oysters), from Holland, which reached the Milford Shellfishery Laboratory on October 11, are in good condition. Before shipment they were examined individually and disinfected to prevent introduction of the spores of shell disease or other parasites to our waters.

The oysters were of three age-classes, the oldest being those which set in 1947. Small numbers of them were planted in several bays and harbors of Maine to determine whether they will survive the Maine winter. If they do, observations will be made next spring and summer to determine whether they will develop gonads and spawn in Maine waters. Other oysters left at Milford will be checked also for survival during the winter, and later systematic observations will be made on their gonad development and spawning.

Groups of these European oysters are now used in Laboratory experiments to determine conditions at which their gonads will mature and the oysters will spawn. Other experiments are so devised that they will show the period of time needed by the oysters to develop gonads at different temperatures. This information is needed because maximum water temperatures attained in Maine are comparatively low and the periods of such temperatures are relatively short. Whether the period of comparatively high temperature in Maine waters is sufficiently long for maturation of gonads and for spawning of O. edulis must be determined.

Several groups of O. edulis are now conditioned in the laboratory for spawning to obtain material for experiments on various physiological and ecological

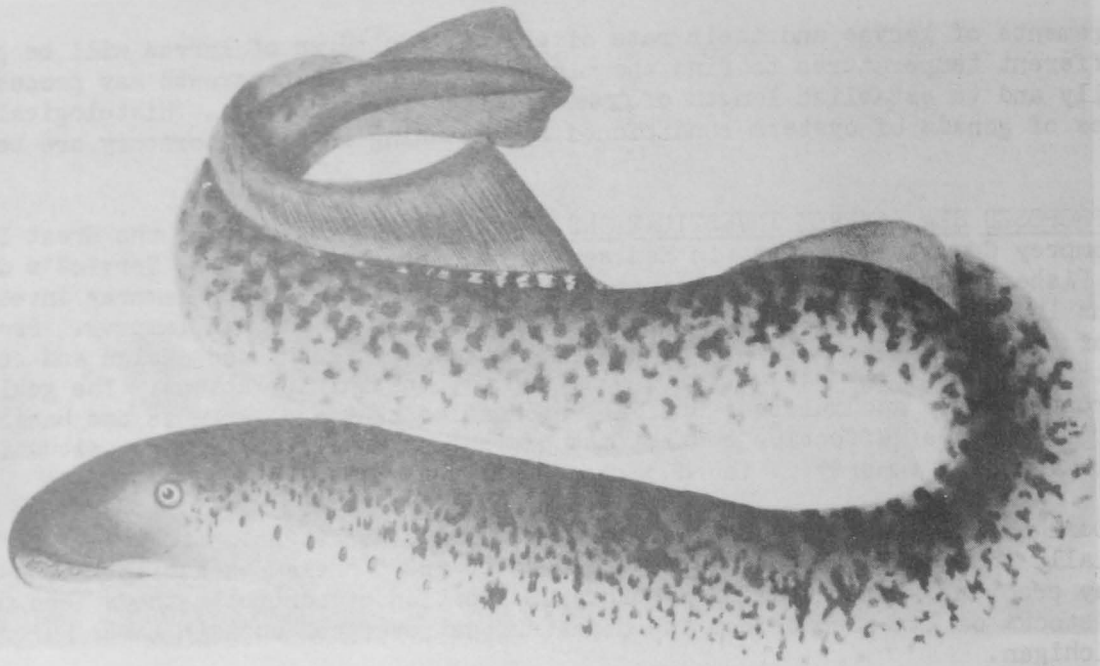
requirements of larvae and their rate of growth. Cultures of larvae will be grown at different temperatures to find the minimum at which their growth may proceed normally and to establish length of free swimming larval periods. Histological studies of gonads of oysters conditioned for spawning in the laboratory are being made.

PROPOSED SEA LAMPREY INVESTIGATIONS IN 1950: At a meeting of the Great Lakes Sea Lamprey Committee meeting in Madison on December 16, 1949, the Service's Great Lakes Fishery Investigations outlined its proposed plans for sea lamprey investigations in 1950. These cover the biology and control of the sea lamprey. Problems of organization, recruitment, and training of personnel and design and construction of special equipment will handicap the initial operations. The goal of the program is to accumulate technical information that can serve as the basis for application of effective control methods suited to all the diverse situations in which the sea lamprey is found.

During 1950, the Service plans to give particular attention to Lake Superior, especially in such matters as surveys, to determine the exact status of the sea lamprey problem. Immediate and vigorous application of control methods here may spare stocks of lake trout from the disaster that overtook them in Lakes Huron and Michigan.

In its program, the Service proposes to include education of the fishing industry, sportsmen, and the general public to an appreciation of the gravity of the present situation. However, the following points should be understood:

1. There should be no talk of eradication of the sea lamprey. The best that can be hoped for is control.
2. There is no assurance that control methods can be developed that will not cost more to apply than the value of the fishery warrants.
3. If a successful control program is worked out, it will have to be established on a permanent basis.
4. Little benefit is to be expected from haphazard, unorganized capture and killing of lampreys. Effective control will require a carefully coordinated program of wholesale destruction of the lamprey at vulnerable periods of its life cycle by means of scientifically tested procedures.
5. Stocks of fish subject to little or no lamprey depredation are threatened seriously by shifts of fishing pressure resulting from decline of lake trout in Lakes Huron and Michigan.
6. The outlook for the Great Lakes fisheries for years to come is extremely dark and no amount of governmental support, scientific investigation, large-scale application of methods for controlling the sea lamprey can change the picture. Even if control methods are devised, years may be required to bring the abundance of sea lampreys to a low level. Following that reduction, more years will be needed to rehabilitate stocks of fish if indeed they can be restored at all in the face of the heavy fishing intensity of present fishing.

GREAT SEA LAMPREY (PETROMYZON MARINUS)

The Service will continue to participate in maintenance of records of recovery and growth of lake trout from plantings of fin-clipped fingerlings made cooperatively by the Great Lakes Lake Trout Committee in Lake Michigan in 1944, 1945, and 1946. The value of this planting experiment will be impaired by depredations of the sea lamprey and the resulting decline in abundance of lake trout, a decline leading rapidly to abandonment of commercial fishing operations for the species. Some usable quantitative data may be retrieved by the Service by examination of catches of trout to determine percentage of fin-clipped fish in the catch.

For practical purposes the lake trout has disappeared as a commercial species in the United States waters of Lake Huron; in Lake Michigan the abundance has declined so rapidly that conditions bear little resemblance to the normal situation of a few years ago.

Although the Service will obtain all possible information on lake trout in the three upper Lakes, the studies must of necessity concentrate on Lake Superior, the only one of the Great Lakes in which the species is still present in fair abundance.

The success of this program will depend in no small measure on cooperation of State and Provincial conservation agencies and of the many private organizations and individuals interested in the future of the Great Lakes fisheries.



Imports of Groundfish (Including Rosefish) Fillets in 1949

Imports of fillets of cod, haddock, hake, pollock, cusk, and rosefish (ocean perch) amounted to 47,777,000 pounds during 1949--6 million pounds less than in 1948 (Table 1). The year's imports were the third highest on record, with 1948 the highest (53,727,697 pounds), and 1946 the second highest (49,171,089 pounds).

Table 1 - U. S. Imports of Groundfish (Including Rosefish) Fillets, 1939-49

Year	Pounds
1949	47,777,000
1948	53,727,697
1947	35,093,435
1946	49,171,089
1945	43,169,156
1944	24,545,569
1943	16,323,416
1942	16,574,082
1941	9,931,030
1940	9,739,853
1939	9,426,285

Table 2 - U. S. Imports of Groundfish (Including Rosefish) Fillets, by Countries of Origin, 1949 and 1948

Country	Total	
	1949	1948
	Pounds	Pounds
Canada	41,872,926	49,141,992
Iceland	4,857,806	4,181,204
Denmark	-	9,352
Netherlands ..	20,845	-
Belgium	17	-
Norway	438,485	395,109
Sweden	-	40
Total ..	47,190,079	53,727,697

The decrease in 1949 was mainly due to lighter shipments from Canada (Table 2). Imports from Norway and Iceland in 1949 were slightly higher than in 1948.

QUOTA FOR 1950 ESTABLISHED: The tariff-rate quota for the calendar year 1950 on groundfish (cod, haddock, hake, pollock, cusk, and rosefish) fillets is 26,235,738 pounds (see page 63 of this issue). The annual quota is the quantity entitled to be entered for consumption in the United States at the rate of 1-7/8 cents per pound. This quota is further divided into quarterly quotas. Any quantity entered over the quarterly quota during each quarter will be dutiable at 2½ cents per pound.

Of the total quantity of fish (26,235,738 pounds) entitled to entry at the rate of 1-7/8 cents, not more than one-fourth shall be so entitled during the first three months. The quota for the first quarter (beginning January 1 and ending March 31, 1950) is 6,558,935 pounds; second quarter, 6,558,935 pounds; third quarter, 6,558,934 pounds; and fourth quarter, 6,558,934 pounds.



Industrial Study of East Coast Shellfish Areas Approved

A grant of \$10,000 to the Atlantic States Marine Fisheries Commission for an industrial study of the shellfish areas along the Atlantic Coast has been approved by the United States Public Health Service. The work will be under the supervision of the Fish and Wildlife Service and will be directed by the Service's Fishery Technological Laboratory at Boston, Massachusetts.

A study of the closed (polluted) shellfish areas along the Atlantic Coast will be made in order to obtain data on the extent of losses to the shellfish industry because of these closures.

The work will be divided into three phases:

1. A compilation of all previous surveys and investigations of pollution in coastal waters, including maps showing areas where studies have been made and where none have been made.
2. Field surveys of all areas affected by pollution to determine the economic value of the areas.
3. Appraisal of all findings under phases of 1 and 2 for their relative urgency and the communication of the facts to the proper authorities.

The initial \$10,000 was approved for the period November 1949 through June 1950. Since the field survey will probably require a minimum of three years and since the appropriation was made on the basis of a continuing fund, it is presumed that additional funds will be made available if the progress of the work warrants it.



New Jersey Fishermen Using Nylon for Fish-Pot Funnel



UNLOADING SEA BASS CAUGHT IN POTS AT CAPE MAY, NEW JERSEY.

Some New Jersey fishermen are using nylon to make the funnels for their fish pots, according to the Service's Fishery Marketing Specialist stationed in that State. Fishermen who used nylon the past season are enthusiastic about the results. New funnels made of Manila and some types of cotton cord usually have to be replaced every season. However, funnels made of nylon have not needed replacement.

Although the nylon cord is expensive, it seems probable that a majority of the operators of pots in this area will be using it before the end of another season. Blue-green nylon cord has been the most successful, according to some of the fishermen.

Although many revisions have been made on the original lath pot, most of the fishermen in the New Jersey area continue to build and operate quite successfully the common wooden trap with either the wood or mesh funnels.

January always finds the pot fishermen in New Jersey repairing and building pots for their seasonal operations.

Exceptionally warm weather this winter has permitted fishing operations by various types of gear in New Jersey to continue through the middle of January. Fishermen state that the water was warmer than normal for this time of the year.



Pacific Coast Methods of Purse Seining to be Tried in East Coast Menhaden Fishery

Pacific Coast methods of purse seining for menhaden are being tried by operators in the North Carolina area in an effort to cut the production costs of the raw product going into fish meal and oil.

The Service's Branch of Commercial Fisheries has detailed two experienced West Coast fishermen to Beaufort, North Carolina, from aboard the vessel Oregon, now at Pascagoula, Mississippi, to give advice in the proper handling of this gear and to help in adapting the gear now being used in the menhaden fishery to the West Coast type of seining.



Pacific Oceanic Fishery Investigations

TUNA FISHERY IN HAWAII AND TRUST TERRITORY: Long-line catches in Hawaiian waters were good in November 1949. Landings ran heavily to big-eyed tunas, with a few albacore and a considerable amount of marlin. On several occasions the vessels caught more fish than could be absorbed by the market. A low price of less than fifteen cents a pound resulted. At the end of the month eight vessels with tuna aboard were tied to the dock, awaiting their turn to sell at auction. Each vessel had approximately as much as the auction could handle in a day.

There has been no commercial tuna development in the U. S. Trust Territory to date. The cannery in American Samoa has not been able to get into operation for lack of raw fish due to difficulties in catching tuna off Fiji, states the November 1949 report from the Pacific Oceanic Fishery Investigations.

TUNA LENGTH AND WEIGHT FREQUENCY DATA: Analysis of tuna length and weight frequency data is being continued by the Section of Biology and Oceanography. While it will require time to complete the study, it is quite possible to determine age and growth of yellowfin and big-eyed tunas from the length-frequency pattern. A very rapid rate of growth and the presence of only a small number of year classes in the fishery are demonstrated by the data.

EARLY LIFE HISTORY STUDIES OF TUNAS: Early life history studies of tunas were initiated in November 1949. Ovaries are being collected routinely from big-eyed and yellowfin tunas to determine whether or not the stage of maturity is correlated directly with weight or volume of the ovary. The purpose of the study is to provide a means whereby the degree of maturity of a fish can be established quickly and objectively by an ovary measurement. An excellent series of big-eyed tuna ovaries is being assembled, but no yellowfin tuna have been available during the month.

TAGGING TUNA: Tunas are difficult to tag successfully. For yellowfin and big-eyed tunas, a specially designed, numbered hook seems to give greatest promise

of success. For skipjack, either the hook or an internal tag similar to that used for sardines and herring seems to assure good results in the local fishery. Arrangements have been made to tag and hold tuna and reef fish in the University of Hawaii's ponds at Coconut Island.

SCHEDULE OF CRUISES: A tentative schedule for the operations of the three vessels of the Pacific Oceanic Fishery Investigations was announced late in January this year.

"Henry O'Malley:" Preparations for more extended cruises in Central Pacific waters to carry out the objectives of the program have been concluded for the Henry O'Malley. The tentative schedule of operations of the vessel is as follows:

<u>Cruise Number</u>	<u>Approximate Dates</u>	<u>Operations</u>
2	Jan. 21 to March 21	To French Frigate Shoals for bait; then to Johnston Island, Kingman Reef; Palmyra, Christmas and Jarvis Islands for bait and tuna exploration. Others in Line Island Group may also receive attention.
3	March 21 to April 10	To French Frigate Shoals and westward to Pearl and Hermes Reef for bait exploration; remainder of cruise same as Cruise No. 2.
4	June 26 to August 25	Repetition of Cruise No. 3, except that bait explorations may be extended to Midway Island.

"John R. Manning:" The proposed schedule of operations of the John R. Manning is as follows:

<u>Cruise Number</u>	<u>Approximate Dates</u>	<u>Operations</u>
1	March 20 to March 30	Shakedown cruise in vicinity of Hawaiian Islands.
2	April 10 to June 10	To Kingman Reef, Palmyra, Christmas, and Jarvis Islands. Purse-seine fishing for tuna.
3	June 25 to August 25	Repetition of Cruise No. 2

"Hugh M. Smith:" For the oceanographic and biological research vessel, Hugh M. Smith, the following schedule is proposed:

<u>Cruise Number</u>	<u>Approximate Dates</u>	<u>Operations</u>
2	Jan. 16 to March 5	To French Frigate Schoals, Canton, and Jarvis. Primarily hydrographic cruise with some tuna fishing near Canton.
3	March 26 to May 5	To Hawaiian waters. Using specially designed long lines to observe relation of physical and chemical oceanographic factors to vertical distribution of tuna.

<u>Cruise Number</u>	<u>Approximate Dates</u>	<u>Operations</u>
4	May 15 to June 15	To Hawaiian waters. Through plankton hauls to study distribution of tuna eggs and larvae and to develop methods for spawning surveys.

Periods between cruises will be used by the three vessels for general repairs, making necessary alterations to or construction of gear, and outfitting for the next cruise.

SHARK LIVERS TESTED: Eight samples of shark livers received from the islands of the Trust Territory were analyzed for oil and vitamin A content by POFI's Technological Section. Oil content ranged from 42 to 82 percent, but vitamin A content was less than 3,000 units per gram of oil.



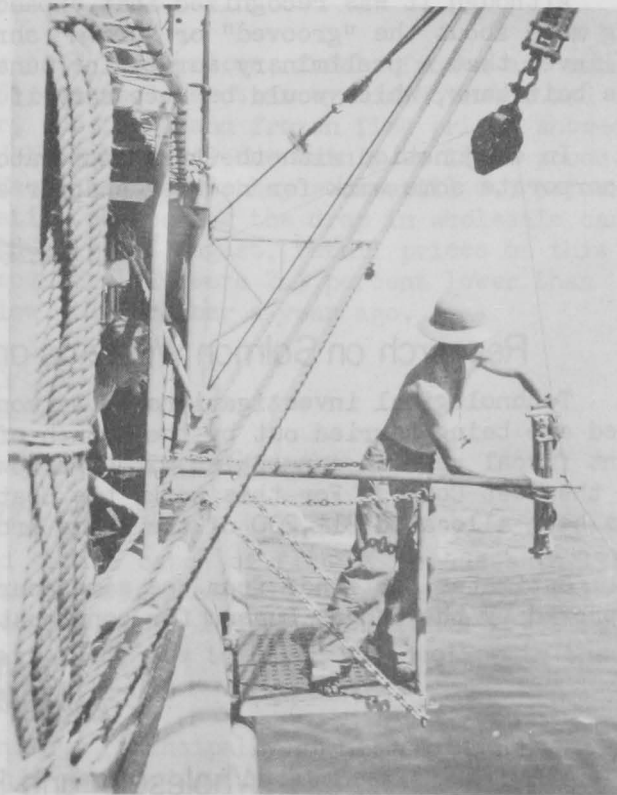
A Philippine Fishery Program Vessel Completes Assignment

The Spencer F. Baird, exploratory fishing and research ship of the Service's Philippine Fishery Program which has been operating for the past 2½ years in Philippine waters, left Manila January 10 to return to the United States, according to an announcement by the Service's Program Administrator and the Director of the Philippine Bureau of Fisheries.

As a part of the activities of the Philippine rehabilitation program of the United States Government, the vessel has been engaged in exploratory fishing and oceanographic research.

Some valuable records were compiled during the vessel's operations in Southeast Asia where an area of 810,000 square miles of Philippine Seas were explored.

In addition to exploratory fishing and oceanography, the vessel has served as a training ship for future Filipino fishermen and scientists. On practically every cruise, the Spencer F. Baird carried from one to eight students of the Philippine Institute of Fisheries Technology.



REMOVING NANSEN BOTTLE FROM LINE ABOARD THE SPENCER F. BAIRD IN THE CELEBES SEA IN THE FALL OF 1947.

A total of 526 oceanographic stations, some of them going as deep as two thousand meters and averaging 1500 meters in depth, have been occupied. From this work the currents in the seas of the Philippines have been plotted, seasonal changes both in the sea and on land will be explained, and the most important fishing areas scientifically defined and their potential productivity measured. Fishing experiments with various types of gear were carried out including long-line trawls, gill nets, jackpoles, seines, and trolling. Biological studies have revealed important data on various species of Pacific fishes, especially tunas. Spawning grounds for this important commercial fish have been discovered, spawning seasons have been described, larval and juvenile tuna have been collected from widely distributed stations in the Philippine seas, and distribution and habits are being studied.



Program for Gulf Fishery Investigations

A fishery exploratory program that would include a survey of Gulf tuna resources was recommended by the Gulf States Marine Fisheries Commission at a meeting held in Tampa on January 18-20 this year for the vessel Oregon of the Gulf Fishery Investigations. Pascagoula, Mississippi, is the base of operations for the vessel.

Although it was recognized that expanding the shrimp fishing areas and learning more about the "grooved" or "brown" shrimp was of primary importance, it was believed that a preliminary survey for tuna would be worthwhile before removing the bait tank, which would be necessary if a shrimp survey were to be undertaken.

In conjunction with the tuna exploratory work, it might also be possible to incorporate some work for new red snapper and shark grounds.



Research on Salmon Waste as an Ingredient of Hatchery Feed

Technological investigations of salmon waste as an ingredient in hatchery feed are being carried out by the Branch of Commercial Fisheries during the current fiscal year in connection with the Lower Columbia River development program on the West Coast. For this work, the Seattle Fisheries Technological Laboratory has been allocated \$11,200 of the funds provided in the Civil Functions Bill.

Estimates for funds from the same source for Fiscal Year 1951 have now been approved by the Budget Bureau for continuation of the hatchery-feed research.



Wholesale and Retail Prices

Average wholesale market prices on December 13, 1949, were 0.2 percent below November 15, and 7.1 percent lower than on December 14, 1948, according to the Bureau of Labor Statistics of the Department of Labor.

Wholesale canned pink salmon prices during December 1949 remained steady and were at the same level as the previous month, but they were still 30.4 percent below December 1948. Canned red salmon prices, on the other hand, continued to rise in December 1949 and were 1.6 percent above the previous month, but 2.5 percent below December 1948.

Wholesale and Retail Prices				
Item	Unit	Percentage change from-		
<u>Wholesale: (1926 = 100)</u>				
All commodities	Index No.	<u>Dec. 13, 1949</u>	<u>Nov. 15, 1949</u>	<u>Dec. 14, 1948</u>
		151.1	-0.2	-7.1
Foods	do	156.5	-1.9	-7.5
<u>Fish:</u>				
<u>Canned salmon, Seattle:</u>				
Pink, No. 1, Tall	\$ per doz. cans	<u>Dec. 1949</u>	<u>Nov. 1949</u>	<u>Dec. 1948</u>
		3.94	0	-30.4
Red, No. 1, Tall	do	6.48	+1.6	-2.5
Cod, cured, large shore, Gloucester, Mass.	\$ per 100 lbs.	15.125	-2.4	+0.8
<u>Retail: (1935-39 = 100)</u>				
All foods	Index No.	<u>Dec. 15, 1949</u>	<u>Nov. 15, 1949</u>	<u>Dec. 15, 1948</u>
		197.3	-1.7	-3.8
<u>Fish:</u>				
Fresh, frozen and canned	do	299.0	-0.5	-8.9
Fresh and frozen	do	267.1	+0.3	-0.5
<u>Canned salmon:</u>				
Pink	¢ per lb. can	47.1	-2.3	-22.9

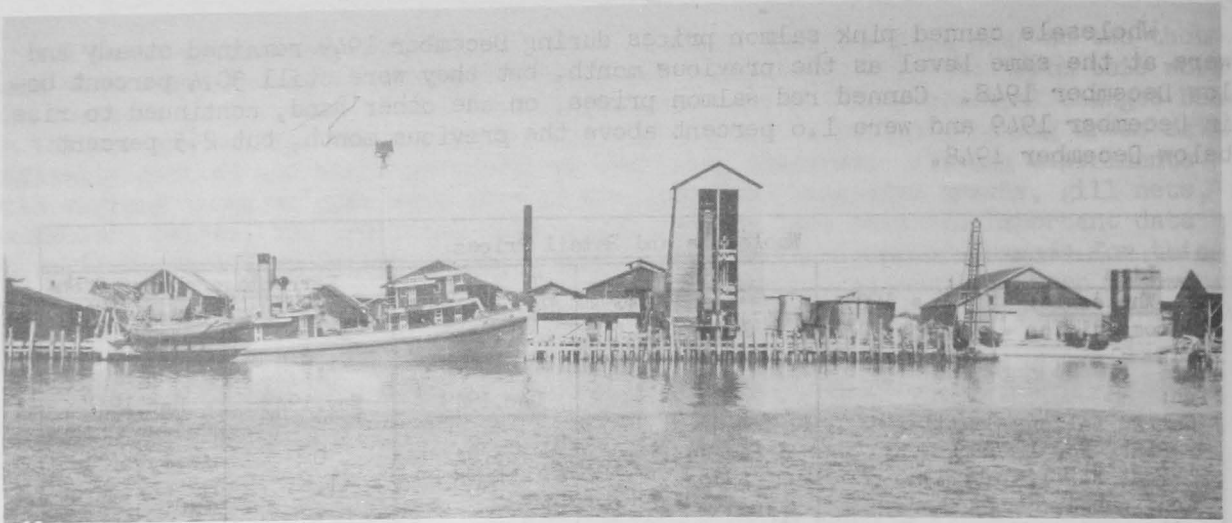
Following the general trend of all retail food prices, fresh, frozen and canned fish prices by mid-December 1949 were 0.5 percent lower than by mid-November and 8.9 percent below December 15, 1948. However, the fresh and frozen fish prices showed a slight increase of 0.3 percent over mid-November 1949 due mainly to light production in the main producing areas on the East Coast, but they were still 0.5 percent lower than mid-December 1948. Probably still reflecting the drop in wholesale canned pink salmon prices which took place in July and August, retail prices on this commodity continued to drop and in mid-December 1949 were 2.3 percent lower than in mid-November 1949 and 22.9 percent below mid-December a year ago.



United States and Alaska Commercial Fisheries, 1949 (Preliminary Review)

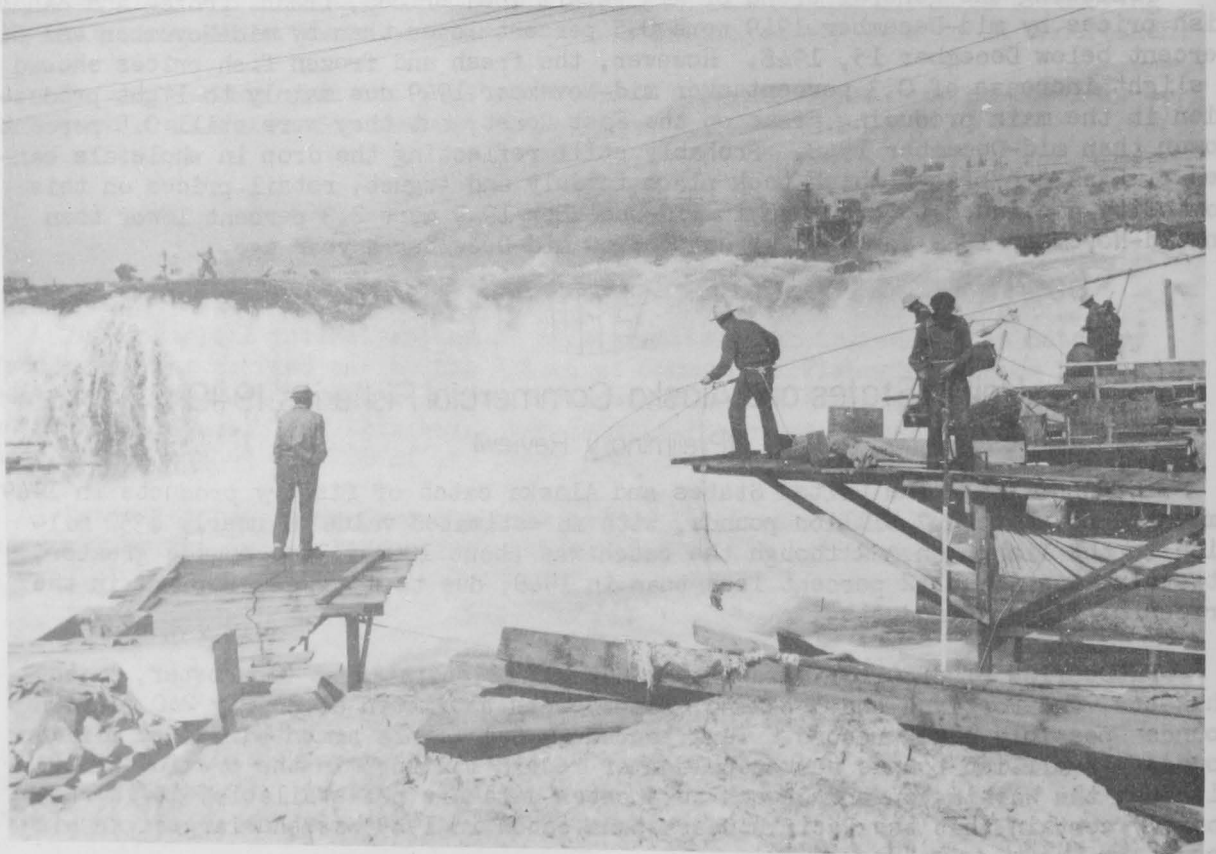
INTRODUCTION: The United States and Alaska catch of fishery products in 1949 amounted to about 4.7 billion pounds, with an estimated value of nearly \$350 million to the fishermen. Although the catch was about 100 million pounds greater, its value was about 12 percent less than in 1948, due to a general decline in the prices of fishery products.

PRODUCTION BY SPECIES: Rosefish landings (principally at Gloucester, Massachusetts, and Portland and Rockland, Maine) were estimated at nearly 240 million pounds—possibly a new record. Tuna landed in California amounted to 324 million pounds—12 million pounds above the former record landings in the previous year. Although the Washington and Oregon tuna catch data are not available, it is reasonably certain that the Pacific Coast tuna catch in 1949 was the largest in history.



A MENHADEN PLANT NEAR FERNANDINA, FLORIDA.

Production of menhaden (taken on the Atlantic and Gulf Coasts entirely for reduction) was estimated at about 975 million pounds, making the 1949 production the second or third largest in the history of the fishery. In 1948, the catch of this species amounted to 1,008 million pounds, while in 1947, it totaled 973 million pounds. Whether or not the 1949 catch will be above or below that of 1947 cannot definitely be determined until final figures become available.



INDIANS FISHING FOR SALMON WITH HOOP NETS AT CELILO FALLS, OREGON.

Important developments in the menhaden fishery were the return of these fish to Maine waters after an absence of 40 years, the construction of new menhaden reduction plants in the Gulf States, and an increase in the catch of these fish in the latter area.

Due to an unexpected large run of pink salmon in southeastern Alaska, the catch of salmon in Alaska and the Pacific Coast States during 1949 was about 15 percent above the 1948 production of approximately 400 million pounds. Although preliminary pack figures have not been received for the Columbia River District or the Coastal Districts of the Pacific Coast States, the 1949 domestic pack of canned salmon was estimated to be about 5,375,000 cases, compared with 4,825,000 cases in 1948.

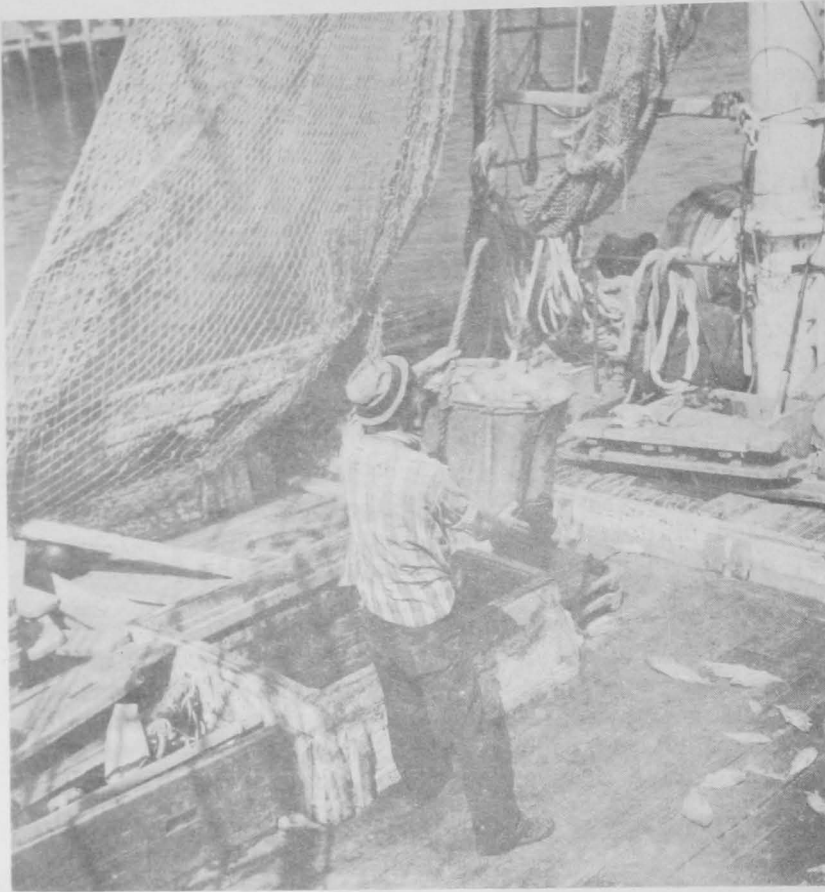
As a result of a steep decline in the price of fish oil, most herring meal and oil producers in Alaska failed to operate, and the 1949 Alaska herring catch amounted to about 37 million pounds, compared with 166 million pounds the previous year. The Maine herring catch (used principally in the canning of sardines) totaled about 150 million pounds, compared with 182 million pounds the previous year.

Pilchards were found in considerably greater abundance off the California Coast in 1949 than in the previous two years, and the catch amounted to 600 million pounds, compared with 373 million pounds in 1948, and a low of 272 million pounds in 1947. However, the 1949 pilchard production was only half as large as the average annual yield during the period of peak catches prior to World War II.



PILCHARD PURSE-SEINE FLEET AT MONTEREY BAY IN BACKGROUND. MACKEREL HAND-LINE BOATS IN FOREGROUND ALSO USED FOR SALMON TROLLING IN SEASON.

NEW ENGLAND PRODUCTION: Landings of fishery products in Maine and in the major Massachusetts ports (Boston, Gloucester, and New Bedford) indicate that the 1949 catch in the New England area declined in both volume and value, compared with the previous year. In 1948, the landings in Maine and at the major Massachusetts ports totaled 834 million pounds, valued at \$55 million; the 1949 landings totaled 822 million pounds, valued at \$47 million. A more pronounced decline would have been evident in 1949 were it not for the development, during the year, of the fishery for scrap fish for meal and oil. Scrap-fish landings in Maine and at the major Massachusetts ports in 1949 amounted to 57 million pounds, valued at about \$600,000 to the fishermen. An additional 15.5 million pounds of scrap fish were landed at Provincetown, Massachusetts; Stonington, Connecticut; and Point Judith, Rhode Island.



UNLOADING ROSEFISH FROM A TRAWLER AT GLOUCESTER, MASSACHUSETTS.

Remarkable developments are revealed by comparing 1949 New England landings with those of a decade ago. The Maine catch in 1939 amounted to 116 million pounds, compared with over 290 million pounds in 1949. Boston landings of fishery products in 1939 amounted to about 300 million pounds, compared with 172 million pounds last year. Gloucester landings in 1939 totaled only 76 million pounds, compared with 253 million pounds in 1949. New Bedford receipts of fish and shellfish in 1939 were 23 million pounds, compared with 105 million pounds last year.

CANNED FISHERY PRODUCTS: Preliminary data indicate that the 1949 pack of canned fish was somewhat larger than

in the previous year and totaled about 850 million pounds, compared with 782 million pounds in the previous year.

Production of canned salmon--which is estimated to have totaled 5,375 cases--was about 550,000 cases greater than in the previous year. In California, where pilchards were canned in much greater volume than in 1948, the pack amounted to about 3,875,000 cases--1,200,000 cases above the previous year's production. The pack of tuna in 1949 was so near the record of 7,038,000 cases canned in 1948 that it will not be possible to determine whether a new record was established until final pack figures are received.

FISH MEAL AND OIL: Fish meal production in 1949 is estimated at about 215,000 tons--an increase of about 15,000 tons compared with the previous year mainly due to large increases of pilchard meal in California and groundfish meal in the New England States. In 1949, about 38,000 tons of pilchard meal was manufactured compared with 19,000 tons the previous year; while groundfish meal totaled over 34,000 tons, against less than 22,000 tons in 1948. Declines occurred in the production of herring meal (in Maine and Alaska) and menhaden meal.

Fish and fish-liver oil production was about 18 million gallons--around 1 million more than in 1948. Although there was a large increase in the manufacture of pilchard oil during the year, there was a decline in herring oil in Alaska and menhaden oil on the Atlantic and Gulf Coasts.



INSIDE VIEW OF A WEST COAST TUNA CANNERY SHOWING THE TUNA-PACKING LINES.

PRICES: The fisheries experienced a general decline in prices during 1949, and values for a number of items declined sharply. Fishermen received about 10 percent less for their catch in 1949 than in the previous year, despite the slight gain in catch.

Fish oil prices, which had reached a peak of 24 cents per pound only two years before, fell to $5\frac{1}{2}$ cents per pound. Sharp price declines also occurred for canned fish at the canners' level for Maine sardines, California pilchards, tuna, and most species of salmon. Whereas canners realized an average of about \$23.50 per case for pink salmon in 1948, the return for the 1949 pack was about \$16.00 per case. Lower prices for canned tuna were reflected in a decline in the price paid for yellowfin (the principal species canned) to the fishermen from \$345 to \$310 per ton. Despite general price declines in other fishery products, the price for fish meal was maintained at a high level because the recognized value of this product in animal feeding stabilized the demand. Prices averaged somewhat over \$150 per ton--about four times the amount received in 1940.

CONSUMPTION: Consumption of fishery products in the United States during 1949 was about the same, or possibly slightly less, than in the previous year, when over 11 pounds per capita were consumed. As a result of the increase in the catch of fishery products, more domestically-caught fish were available for consumption than in the previous year. However, exports of edible fishery commodities were somewhat larger than in 1948, while imports declined a little.

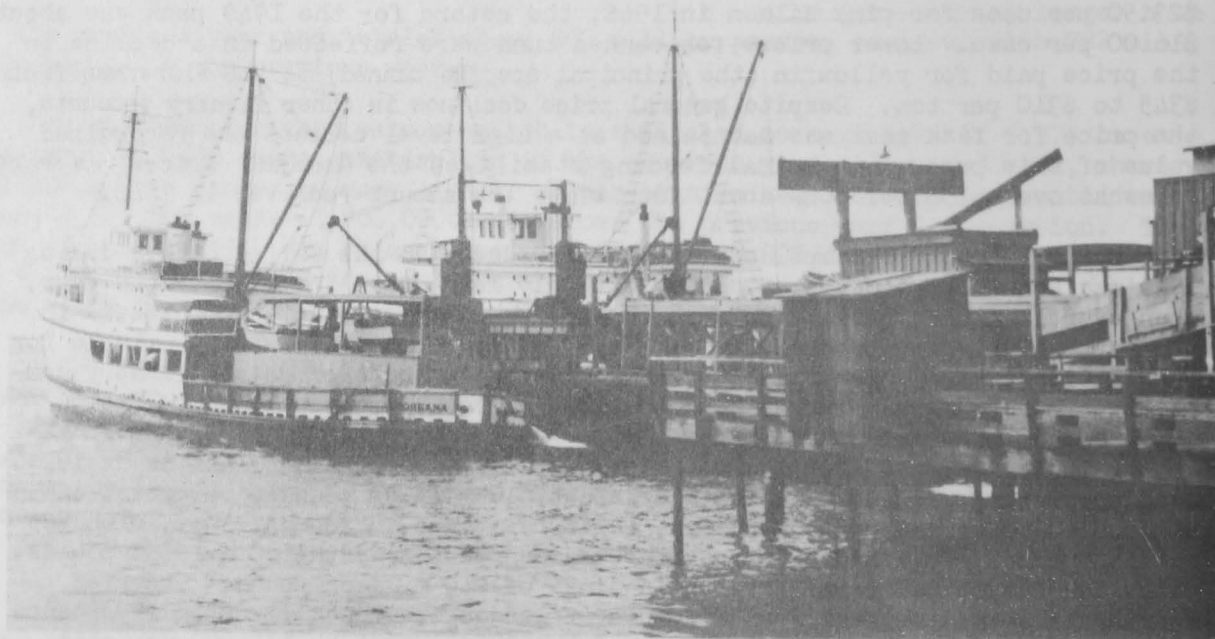
PRINCIPAL FISHING PORTS: San Pedro, California, continued as the Nation's leading fishing port with landings of about 540 million pounds, valued at \$26.5 million to the fishermen. Monterey, California, was in second place, with 285 million pounds; followed by Gloucester, Massachusetts, with 250 million pounds. While San Diego, California, (with landings of 210 million pounds) occupied fourth place with respect to the volume of landings, it was first in importance as far as value was concerned. Value of the landings at that port were estimated at \$31 million.



SHRIMP FLEET AT ST. AUGUSTINE, FLORIDA.

STOCKS OF FISHERY PRODUCTS: Stocks of frozen fishery products on January 1, 1950, were approximately 4 million pounds less than on the same date the previous year. Fish and shellfish frozen during 1949 amounted to 285,822,000 pounds, compared with 291,988,000 pounds during the previous year.

Although information is not available on stocks of canned fishery products, it is believed that supplies of a number of items (canned salmon, California sardines, and tuna) were considerably higher on January 1, 1950, than on the same date the previous year.



TWO TUNA CLIPPERS UNLOADING AT SAN DIEGO. TUNA WAS CAUGHT OFF THE GALAPAGOS ISLANDS.

FISHERMEN AND FISHING CRAFT: Current information is not available on the number of fishermen and fishing craft employed in taking fishery products. However, it was estimated that more than 8,000 vessels of five net tons and over were operated during 1949.

Number of persons employed as fishermen during the year was estimated at about 160,000.

Construction of fishing vessels continued at a high level. However, the number documented as fishing craft during the year was about 200 less than in 1948, when 1,184 vessels entered the fisheries. Although 1949 was the first year since 1945 that the number of vessels documented fell below 1,000, the number of vessels built was still two to three times the average number constructed in the five years prior to World War II.

FISHERY PRODUCTS PLANTS: During the postwar years, great improvements were made in fishery products plants. Many firms built new establishments or remodeled existing structures. It is expected that plant construction will level off during 1950. However, considerable activity is expected in some regions, particularly in the Gulf area, where new menhaden plants are planned, and where tuna canneries may be built.

FOREIGN TRADE: Exports of edible fishery products during the first 11 months of 1949 amounted to 127 million pounds, compared with 83.4 million pounds during the same period in 1948. Large shipments of salmon and pilchards to the United Kingdom, and pilchards to the Philippine Islands were the cause of the increase in exports.

Imports of fishery products into the United States during the first 11 months of 1949 totaled 428 million pounds, compared with 435 million pounds during the same period in 1948. Imports of cod, haddock, hake, pollock, cusk, and rosefish fillets during 1949 amounted to 47,190,000 pounds, compared with 53,728,000 pounds the previous year.



FISH FACTS

DO YOU KNOW.....

That the sense of smell in some fishes is extremely acute and they are attracted from great distances by certain feeds.....