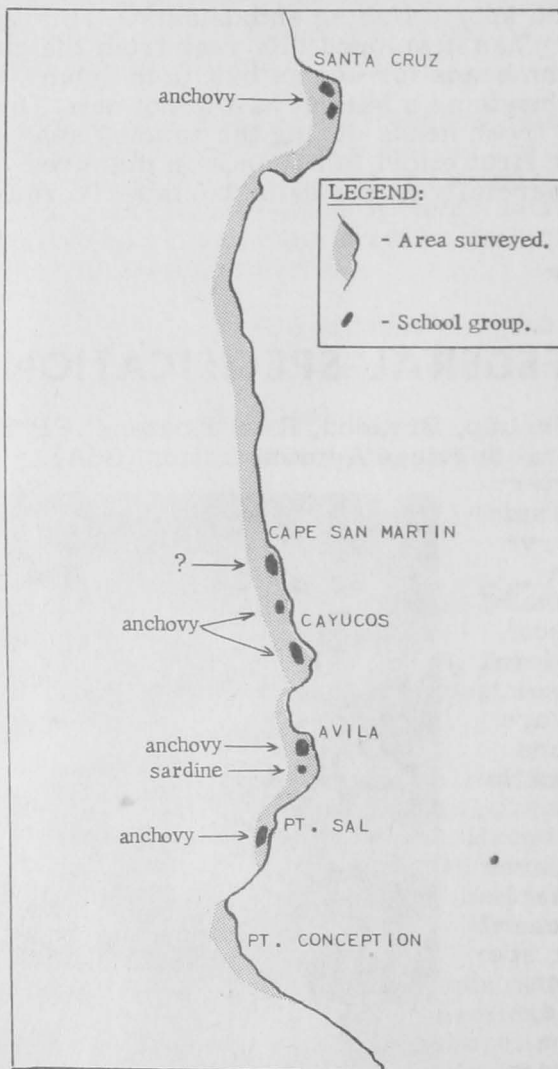


TRENDS AND DEVELOPMENTS

California

ABUNDANCE DETERMINATION OF SARDINES AND ANCHOVIES IN CENTRAL CALIFORNIA (Airplane Spotting Flight 56-6): To determine the abundance and distribution of sardines and anchovies in the inshore area of Central California between Santa Cruz and Pt. Conception was the purpose of an airplane spotting flight on

July 30 conducted by the California Department of Fish and Game Cessna "170" (1359D).



Airplane spotting flight 56-6 (July 30, 1956).

This flight was scheduled to cover the area between Bodega Bay and Pt. Conception, but fog prevented scouting of the entire area north of Santa Cruz and of small areas near Pt. Sal and Pt. Buchon. A total of 280 miles of coastline were covered, in which 110 schools of anchovies, totaling 898,000 sq. ft., 2 schools of sardines totaling 6,700 sq. ft., and 15 unidentified schools were observed.

In June 1956, 465,000 sq. ft. of anchovies were observed in the San Simeon-Pt. Conception area, whereas on this flight 715,000 sq. ft. of anchovies were tallied in this area, indicating an increased concentration over last month. In the Monterey Bay area 491,000 sq. ft. of anchovies were tallied in June and 182,700 sq. ft. in July. Inasmuch as the area between Santa Cruz and Davenport was not scouted, it is not certain whether the above figures for Monterey Bay indicate a true decrease.

Two small schools of sardines were seen five miles south of Avila. Three days previous to this flight two commercial aerial spotters scouted the area from Morro Bay to Pt. Conception and found only a few small sardine schools in the area between Pt. Arguello and Pt. Conception. No schools of any species were observed in the area between Pt. Conception and Pt. Arguello on this flight.

Fifteen schools of unknown species were observed in shallow water three miles south of Cape San Martin. Two of these schools were black in color and close observation failed to distinguish individual fish or flashes. The other twelve schools

were reddish-orange in color and may have been either juvenile anchovies or juvenile rockfish.

FIRST SILVER SALMON TAKEN IN SACRAMENTO RIVER: Possibly the first adult silver salmon ever taken in the Sacramento River has been trapped at California's Department of Fish and Game tagging station at Fremont Weir near Knights Landing.

Fisheries biologists say there is little doubt that the 16.7-inch fish was the first return from some 60,000 yearling silvers planted in Mill Creek last spring. Some of these fish were as much as nine inches long when stocked in the creek, which is a major salmon and steelhead spawning tributary of the Sacramento.



It is not unusual for steelhead to be planted as yearlings in the spring and return upriver from the ocean in the fall. The silver salmon trapped and examined by the biologists was mature and probably would have spawned later this fall.

The experimental plant of silvers was made in the hope that a run of silvers could be established in the Sacramento system. They enter coastal streams both north and south of the Golden Gate, but never have entered the Sacramento River system before.



Albacore tuna tagging by M/V N. B. Scofield (Cruise 56-S-3, July 2-23, 1956).

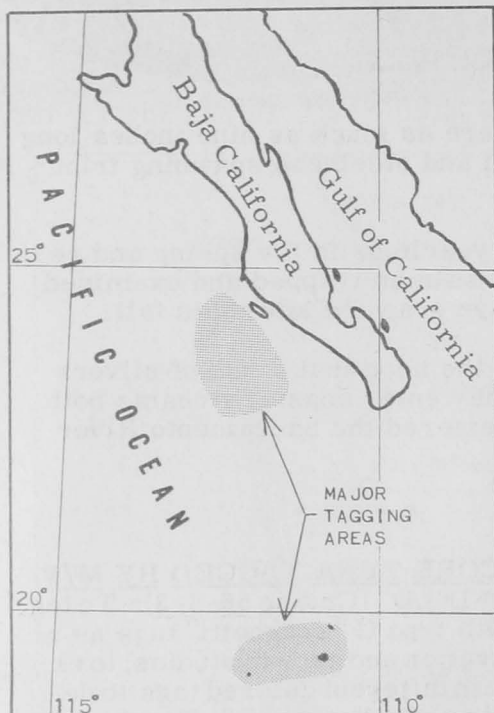
ALBACORE TUNA TAGGED BY M/V "N. B. SCOFIELD" (Cruise 56-S-3): To tag albacore with type G "spaghetti" tags as a part of migration and growth studies; to experiment with different colored tags to determine if tag color has any relationship with tag recovery success; and to make biological and oceanographical observations in respect to occurrence of albacore were the objectives of Cruise 3 of the research vessel N. B. Scofield of the California Marine Fisheries Branch. The vessel left San Pedro July 2, 1956; fished the area off the coast of Southern California and northern Baja California encompassed by latitude 29° N. to 32° N. and longitudes 116° W. to 119° W.; returned to San Pedro July 23.

Albacore were caught by means of both live bait and trolling jigs. All albacore caught in good viable condition were tagged, measured, and released. The red, white, and blue tags, all type G with jackets, were applied in alternating-color groups of five tags per group. General observations included Bathythermograph casts, weather, and incidental marine-life sightings.

A total of 420 albacore were tagged, 140 of each color, and released. All fishing was done in the vicinity of the commercial fleet, which was in full operation

during the cruise. Roughly two-thirds of the fish were caught trolling feather jigs and the remainder on bait. Rough weather and poor fishing during the first ten days greatly hampered the tagging operation.

Examination of albacore stomachs revealed that the Pacific saury (*Cololabis saira*) made up the bulk of the food. Quantities of red crab (*Pleuroncodes* sp.) and a species of rock fish, Sebastodes, were quite common in the fish from the southern extremity of the area fished. Large concentrations of tunicates (*Pyrosoma* sp.) were observed in the vicinity of lat. 31°-35' N., long. 118°-30' W. Finback and California gray whales were sighted on several occasions in the central and northern parts of the area fished. Night-light collections yielded mostly saurys and a few yet-to-be-identified fish. Fish of various species were collected from a bait net haul at Cape Colnett, Baja California.



M/V *Lucky Star* tuna-tagging Cruise 56-C-3
(July 2 - Aug. 3, 1956)

Surface water temperatures in the areas fished ranged between 16.1° C. (60.9° F.) to 18.6° C. (65.8° F.). Fishing was at optimum in the range 16.1° C. (60.9° F.) to 16.6° C. (62° F.). Fifteen bathythermograph casts were made in the areas fished.

CLIPPER TAGS YELLOWFIN AND SKIP-JACK TUNA (M/V "LUCKY STAR," Cruise 56-C-3): Tagging of yellowfin and skipjack tuna was accomplished by the tuna clipper *Lucky Star* on this cruise (July 2-August 3, 1956) conducted by the California Department of Fish and Game. Operations were concentrated off the coast of Baja California and Roca Partida Island (one of the Revilla Gigedo Island group). A total of 661 yellowfin and skipjack tuna were tagged and released with type "G" tags. Three types of colored tags were used: red, white, and blue.



Cans--Shipments for Fishery Products, January-June 1956



Total shipments of metal cans during January-June amounted to 51,991 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 45,137 tons in the same period of 1955. The increase in this year's shipments reflects the heavier pack of canned tuna as compared with the January-June 1955 period (when production was curtailed due to oversupply) and also the increased activity in the packing of Maine sardines, salmon, and other fishery products which begins in June.

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.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, JULY 1956: For the use of the U. S. Army, Navy, Marine Corps, and Air Force the Army Quartermaster Corps in July 1956 purchased

3,184,000 pounds (valued at \$1,615,000) of fresh and frozen fishery products. This was 16.3 percent more in quantity and 30.8 percent more in value than purchases the previous month and 57.5 percent more in quantity and 98.6 percent greater in value than purchases in July 1955.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (July and the First Seven Months of 1956 with Comparisons)

QUANTITY				VALUE			
July		Jan. - July		July		Jan. - July	
1956	1955	1956	1955	1956	1955	1956	1955
(1,000 Pounds)				(\$1,000)			
3,184	2,022	15,415	15,136	1,615	813	7,705	6,441

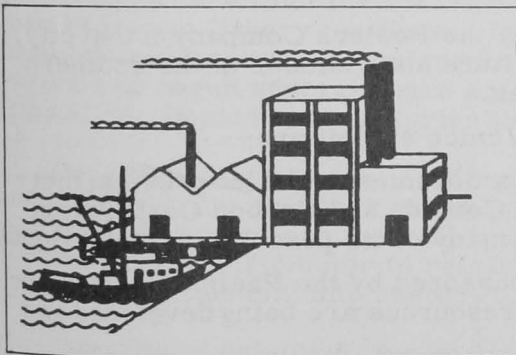
During the first seven months of 1956 purchases of fresh and frozen fishery products totaled 15,415,000 pounds (valued at \$7,705,000)--1.8 percent more in quantity and 19.6 percent more in value than purchases for the same period a year earlier. This shows that this year purchases were composed of higher-priced products.

Prices paid for these fishery products by the Department of Defense in July averaged 50.7 cents a pound as compared with 45.1 cents a pound the previous month and 40.2 cents a pound in July 1955.

In addition to the purchases of fresh and frozen fishery products reported, the Armed Forces generally make some local purchases which are not included in the data given. Therefore, actual purchases are higher than indicated, but it is not possible to obtain the local purchases made by military installations throughout the country.

CORRECTION: In the August 1956 issue of Commercial Fisheries Review in the news item "Federal Purchases of Fishery Products," the first sentence of the first paragraph should have given the May 1956 purchases as "2,715,000 pounds" instead of "2,715 pounds" as shown. The figures which appeared in the table shown in that issue were correct.

CANNED FISHERY PRODUCTS PURCHASED THROUGH QUARTERMASTER MARKET CENTERS, APRIL-JUNE 1956: Canned tuna and sardines were the princi-



Canned Fishery Products Purchased Through Quartermaster Market Centers, January-June 1954-55

	Tuna	Salmon	Sardines
 (1,000 pounds)		
Jan. - June 1956 . . .	2,188	601	227
Jan. - June 1955 . . .	716	2,236	63
Jan. - June 1954 . . .	939	471	9

pal canned fishery products purchased for the use of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps through its Market Centers during the

second quarter of 1956. Purchases amounted to 792,000 pounds of canned tuna and 219,000 pounds of canned sardines.

It is believed that only a portion of the requirements for canned sardines are represented in the data given since some canned sardines and canned fishery products other than tuna and salmon are procured locally and no information is available on those purchases. Therefore, actual canned fishery products purchases are higher than indicated.



Films

FISHERY FILMS SHOWN AT VENICE EXHIBITION: The four Department of the Interior documentary films which were recently selected for showing at the Edinburgh Film Festival were also chosen for display at the International Exhibition of Cinematographic Art at Venice, Italy it was announced August 17. The films were to be shown in the Exhibition of Documentary and Short Length Films, a section of the International Exhibition, August 16 to August 25. The films are 16 mm. with color and sound.



"Outboard Fisherman U. S. A."

The four films were produced by the Department of the Interior in cooperation with industry. Two of the films were made under the direction of the Bureau of Mines and two under that of Fish and Wildlife Service.

Fish and Wildlife Service films have been honored at the Venice International Exhibition on four other occasions. One Service film It's the Maine Sardine, won first place in the public relations category in 1949.

The Fish and Wildlife Service films selected for the Venice exhibit are:

Outboard Fisherman U. S. A. shows the taking of fish in ten different parts of the country from Maine to Alaska. It was sponsored by the Outboard Marine and Manufacturing Company of Milwaukee, Wis.

Shrimp Tips from New Orleans, sponsored by the Peelers Company of that city, makers of processing equipment, portrays the culture and glamour of the southern metropolis--and six of its favorite shrimp recipes.

The Bureau of Mines films selected for the Venice exhibit are:

The Petrified River--The Story of Uranium, a documentary of the greatest metal hunt in history. It was sponsored by the Union Carbide and Carbon Corporation and tells the story of uranium from its source to many of its peacetime applications.

Arizona and Its Natural Resources, a film sponsored by the Phelps-Dodge Corporation shows how the mineral and agricultural resources are being developed and utilized for the benefit of mankind.

These films may be secured on a loan basis without charge. Only one of them, however, Arizona and its Natural Resources, is available at the present time. The other three will probably be ready for distribution in September.

The United States Government films are selected for international showing by the Interdepartmental Committee on Visual and Auditory Materials for Distribution Abroad.

Other Department films which have been shown in Venice are: The Story of Menhaden, 1951; Food for Thought, 1950; Filleting and Packaging Fish, 1947; and California and its Natural Resources, 1949.

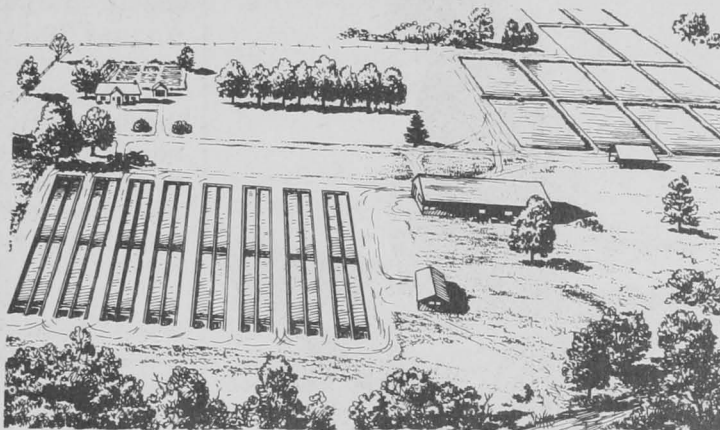
Note: Also see Commercial Fisheries Review, August 1956, p. 23.



Fish Hatcheries

WORK ON SIX NEW HATCHERIES STARTS: Engineering work on the \$2,856,000 Federal fish-hatchery program which has received Presidential approval will begin at once, and actual construction will get under way as quickly as possible, Secretary of the Interior Fred A. Seaton said August 17.

Of the total available, \$1,060,000 is for six new hatcheries, two of which will be enlarged replacements for existing facilities. Two hatcheries are being constructed for the propagation of trout only, two for warm-water fish only, and two are combination facilities for both trout and warm-water fish.



Both catchable-size and fingerling trout will be produced. The warm-water hatcheries will rear walleye and northern pike fry, and bass, bluegill, and catfish fry and fingerlings. The six new hatcheries will be located at Miles City, Mont.; Pittsford, Vt.; John Rock area near Brevard, N. C.; Paint Bank, Va.; Cedar Bluff, Kans.; and one in West Virginia.



Frozen Foods Temperature Tolerance

Although no fishery products are involved, results of a research project on time-temperature tolerance of frozen foods are of interest to packers and distributors of frozen fishery products. Industry and government representatives discussed these results in a conference held July 30-August 1 at Albany, Calif. The project was begun several years ago in the Western Utilization Research Branch of the U. S. Department of Agriculture.

The project was to obtain information for use in the commercial handling of frozen foods from producer to consumer. From a few at the beginning, thousands must handle and use commercial frozen foods. As frozen foods move from packer to warehouse to distributor to retail store and consumers, they move in diminishing unit quantities and into custody or ownership of an increasing number of people.

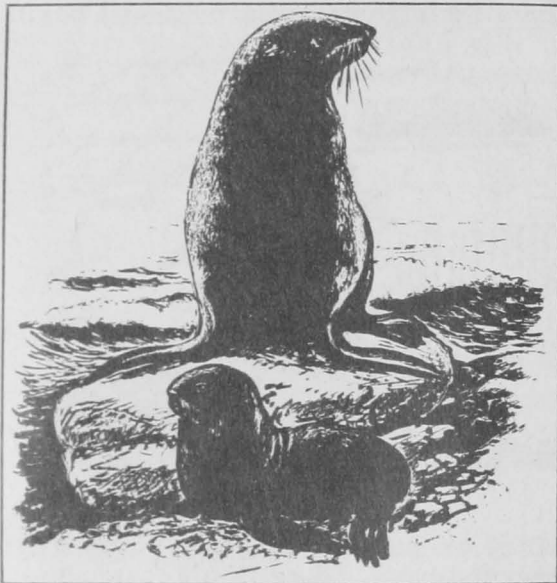
The results establish, for each frozen food, just how much faster quality change takes place at 10° F., 20°, or 30° than at 0°. Products change at different rates under the same conditions. Partial damage, no matter how minute or slightly detectable on casual examination, is never reversed by reduction of temperature. By and large, geographical variations were found to be small. Within limits, certain

changes in raw material and processing (including packaging) strengthen frozen foods against temperature hazards.



Fur Seals

SERVICE BEGINS HARVESTING FEMALE SEALS OF PRIBILOF HERD: As a step toward maintenance of the Pribilof Islands fur-seal herd at an optimum level--in terms of both biology and economics--the 1956 operations have been expanded to include the harvesting of some female seals, the U. S. Fish and Wildlife Service announced August 30, 1956.



About 30,000 females are to be taken in the harvest, and the information which will be obtained this year relative to the time and conditions for taking females will give the Service, which has the responsibility for the seal herd, the design of its future operations.

The Pribilof Islands fur-seal herd was near extinction in 1911 when pelagic sealing--harvest on the high seas--was banned by treaty. The herd numbered only 125,000 animals at that time, compared with 1,750,000 today. The first step in restoration of the herd following ratification of the 1911 Convention was to discontinue all land killing for five years. At that time killing of males

was resumed, but was limited only to those surplus to the needs of the growing herd. All of the females were needed during this restoration period, but a part of the male population was surplus because these animals are polygamous, having harems of 50 or more females, although at birth they are present in equal numbers. By this method of management, approximately 2 million surplus male seals were killed during the restoration. The herd now is fully restored.

Service officials anticipate that killing 30,000 cow seals a year will relieve the congested rookeries and reduce pup mortality. As a result of the increased pup survival, because half of them are males, there will soon be more three- and four-year males in the herd and a larger harvest possible without any decline in the herd's productivity. In short, an added harvest is substituted for annual mortality.

Service officials intend to pay particular attention to the size and condition of the herd during the taking of the females. The harvest of females, the first such harvest in nearly 50 years, began with the regular season--mid-June--and continued until August 15. Operations will be resumed early in September and will continue until mid-October 1956.

Since it has been nearly 50 years since American sealers have taken female pelts, little is known about the time when the quality of these skins is best, or the best conditions under which the females should be harvested. Records are being kept on a day-to-day basis on the condition of the pelts, the condition of the rookeries, the difficulties encountered in taking the cows, the effect of weather, the effect of late season operations as well as comments and suggestions on harvest operations. Each female skin will be marked in such a way that the date of taking can be determined at any stage of the processing. In this way it will be possible to learn the periods at which the skins are at their top value.

The male pelt is best when the animal is three or four years old. Since the old bulls maintain harems of between 25 and 100 cows, and drive the younger males away from the herd, the age group wanted for harvest is automatically segregated. The harvesting policy of 65,000 males annually permits about 10 percent of the younger bulls to reach breeding age--the seventh year--and establish harems.

As far as is known now, the female pelt is good at any mature age. This considerably widens the harvest age of the seal herd. The life span of the fur seal is about 19 years, and the female begins to bear young at about three years. The female seals arrive on the Pribilofs early in June after almost a year at sea. The old males precede them by two or three weeks and the younger seals follow them by a week or two. The pups are born shortly after the females arrive at the rookeries. Each has but a single pup--average weight 12 pounds--in any one year. The nursery season for the new pup is also the new mating season.

The Pribilof Islands in the Bering Sea are five in number, the largest being St. Paul Island. It is 14 miles in length. St. George Island, 40 miles away, is second in size--about 10 miles in length.

Records show that before 1834 the Russians, who at that time owned Alaska and the Pribilofs, took 2 million seal pelts. Because of the decrease in the size of the herd, the Russians placed restrictions on the harvest and from 1834 until the United States took over the Islands with Alaska in 1867, only 600,000 pelts were taken.

From 1870 until 1910 the United States permitted the land killing of seals on a lease basis. During the first 20-year period the taking of 100,000 pelts a year was permitted. The total harvest for that period was 1,927,377 pelts which brought the United States Government \$6,020,152 in revenue. During the next 20 years there was a sharp decrease in numbers of seals and the take was only 342,651 pelts for which the Government received \$3,453,844. In addition, many thousands of seals were killed during this period by small vessels operating on the high seas without regard for the future of the resource. Pelagic sealing was wasteful, since many killed animals were lost, and since the killing was indiscriminate.

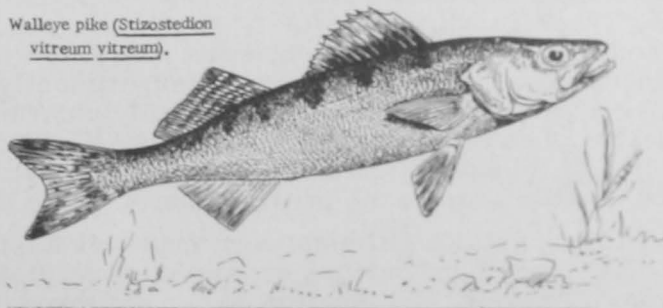
Then in 1911, pelagic sealing was banned and land killing was discontinued for five years. Since then the harvesting of the Pribilof Islands' seals has been exclusively on land as a United States Government responsibility, administered first by the Secretary of Commerce and now by the Secretary of the Interior.



Great Lakes Fishery Investigations

WALLEYE ABUNDANCE IN SAGINAW BAY DURING SUMMER STUDIED BY M/V "CISCO" (Cruise 3): To determine the species composition and abundance of fishes in shallow water during the summer, with special attention given to walleye, was the purpose of Cruise 3 (July 11-23, 1956) of the Service's research vessel Cisco. This cruise was confined entirely to Saginaw Bay and portions of Lake Huron immediately adjacent to the Bay. During the summer walleye practically disappear from the commercial trap-net fishery of the Bay.

Walleye pike (*Stizostedion vitreum vitreum*).



Nylon gill nets with $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, and 4-inch mesh were set on the bottom at 4 fathoms just north of Charity Island and in $2\frac{1}{2}$ -3 fathoms north of Sand Point, and another gang made up of $2\frac{1}{2}$ - and $3\frac{1}{2}$ -inch mesh was set in 3 fathoms off Au Sable Point. White suckers (Catostomus commersonnii) predominated in the catches off Au Sable Point and Sand Point and white suckers and alewives (Pomolobus pseudo-harengus) made up the bulk of the catch off Charity Island. Three walleye (Stizostedion vitreum vitreum) were taken off Charity Island and 8 off Sand Point. Their lengths ranged from 11.5 to 19.7 inches. A moderate number of yellow perch (Perca flavescens) were caught in the smaller mesh sizes of nets set off Charity Island and Sand Point. Other species taken included 1 yellow bullhead (Ameiurus natalis), 2 channel catfish (Ictalurus lacustris), and one white bass (Lepibema chrysops).

The usual oblique sets of $2\frac{1}{2}$ -inch-mesh gill nets were made in 13 and 26 fathoms off East Tawas, and in addition an oblique set of $3\frac{1}{2}$ -inch-mesh nets was made at 13 fathoms. The $3\frac{1}{2}$ -inch mesh took only two perch and one bloater (Leucichthys hoyi), all at mid-levels. The $2\frac{1}{2}$ -inch set in 26 fathoms took 2 perch, 1 Leucichthys kiyi, 6 smelt (Osmerus mordax), and 1 bloater, scattered throughout the net except in the top 20 feet. Thirty-three bloaters, 12 smelt, and 3 perch were scattered throughout the shallow set. A $2\frac{1}{2}$ -inch-mesh bull net 300 feet long and 120 meshes deep was set over a 26-fathoms bottom with its float line 6 feet below the surface. This net took 7 Leucichthys alpenae, 1 alewife, 9 smelt, and 1 perch.

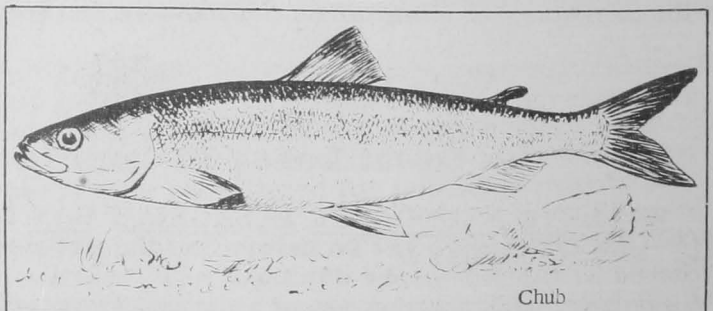
Bottom trawling was carried out in several locations at depths ranging from $2\frac{1}{2}$ to $10\frac{1}{2}$ fathoms. Catches included mostly perch, smelt (approximately 4,750 of this species were taken in one 10-minute tow), alewives, and forage fish. Several white suckers and one carp (Cyprinus carpio) were also caught. Night midwater trawling was done in shallow water off Oscoda, Mich.; alewives dominated the catch.

The hydrographic transects from Bay City to East Tawas, East Tawas to Harbor Beach, East Tawas to Oak Point, and Hat Point to Au Sable Point were run as in the previous cruises. Surface temperatures ranged from 14.6°C . (58.3°F .) to 23.5°C . (74.3°F .).

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CHUB POPULATION STUDIED IN LAKE HURON BY M/V "CISCO" (Cruise 4):
Work in Lake Huron by the Service's research vessel Cisco during Cruise 4 (July 31-

August 13, 1956) was primarily to investigate further the chub population. This cruise, duplicating Cruise 2, covered Saginaw Bay and part of southern Lake Huron. Nylon gill nets (mesh sizes 2, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, 3, and 4 inches) were set in 25 fathoms off Harbor Beach and 50 fathoms in mid-lake between Harbor beach and Gode-rich. These gangs, except for the addition of the 2-inch mesh, were identical with gangs set in the same locations during Cruise 2. The shallow set caught mostly bloaters (Leucichthys hoyi) as in Cruise 2, but the catch was considerably smaller if the 2-inch mesh is not considered. The 50-fathom set caught mostly L. kiyi, with a few L. reighardi, lake herring (L. artedi), bloaters, and longjaws (L. alpenae). The catch of the latter species was much smaller than in the previous set.



Oblique sets of gill nets were made off East Tawas in 13 and 26 fathoms as usual. The very light catches consisted of perch (Perca flavescens), smelt (Osmerus mordax), herring, and bloaters scattered throughout the nets, but mostly from 40 feet below the surface to the bottom. A bull net (300 feet long, 120 meshes deep)

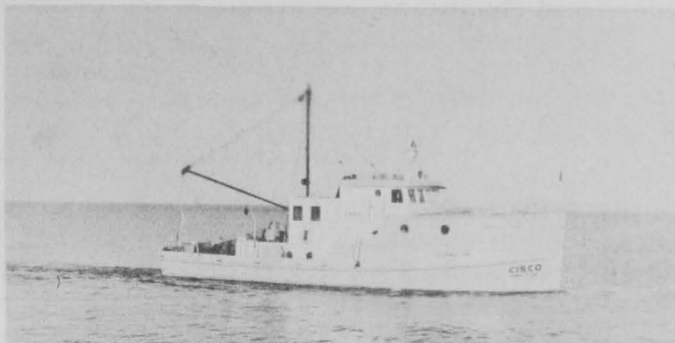
was set over a 26-fathom bottom with the float line in the thermocline and the lead line beneath it. Only 3 smelt were caught. One of the main purposes of the oblique sets and of fishing bull nets is to locate the summer grounds of the herring which enter Saginaw Bay in great numbers in the fall.

A gill net was set on the bottom in 4 fathoms off East Tawas. The rather light catch was predominately white suckers (Catostomus commersonii), perch, and alewives (Pomolobus pseudoharengus). Of special interest were two rainbow trout (Salmo gairdneri) and one brown trout (Salmo trutta) in the catch.

Several areas with good trawling bottom were located in Saginaw Bay. Large numbers of perch, smelt, and forage fish were taken in the trawls. Only one walleye was caught, and it is doubted that there are any large concentrations of this species in the Bay in the summer.

Collections were made with a seine in six areas along the northwest shore of Saginaw Bay in order to study the inshore fish faunas and especially to locate walleye fingerlings. No walleyes were taken, but good catches of perch and largemouth black bass (Micropterus salmoides) fingerlings were caught.

Hydrographic transects were run from Bay City to East Tawas, East Tawas to Harbor Beach, Harbor Beach to Goderich, East Tawas to Oak Point, and Hat Point to Au Sable Point. In addition to the usual limnological studies, photometer readings were taken at 23 stations. Surface water temperatures varied little over the Bay and Lake Huron proper, except for a narrow area of upwelling off the Canadian shore where a low reading of 12.1°C . (53.8°F .) was recorded. The highest surface temperature was 25.1°C . (78.4°F .) near the mouth of the Saginaw River in Saginaw Bay.



Cisco, Research vessel of the Service's Great Lakes Fisheries Investigations.

Ionizing Radiation Center Planned

Establishment of a Quartermaster Radiation Planning Agency to develop plans for operation of the Army Ionizing Radiation Center was announced early in September by the Department of the Army. The new Agency will function under the Quartermaster Research and Development Command at Natick, Mass. Eventually the agency will be located at the Army Ionizing Radiation Center, the site of which is yet to be selected.

In addition to planning operations of the Center, the new Agency will be responsible for integrating the Center's activities with those of the Quartermaster Food and Container Institute, Chicago, and other Quartermaster research organizations concerned with irradiation sterilization of food and other materiel. The Center, when in operation, is expected to have a peak capacity of 1,000 tons of irradiated food a month.

Research thus far conducted under the direction of the Army Quartermaster Corps has established the feasibility of utilizing nuclear emanations, such as gamma rays and electrons, instead of heat, to kill or inactivate micro-organisms which are responsible for food spoilage. The ultimate military and civilian advantages of the

process include a reduction in refrigeration requirements, reduced food losses, improved control of certain food-borne diseases, and a wider availability of fresh foods under field conditions, according to the Department of Defense release.



Market Outlook for Fishery Products

OCTOBER-DECEMBER, 1956: Good supplies of staple and specialty types of fish and shellfish will be available for the holiday and preholiday events of the fourth quarter, the U. S. Fish and Wildlife Service reports in the Commercial Fisheries Outlook, October-December 1956,

issued October 16.



The quarter will be highlighted by a massive sales effort centered around the "Fish Parade," which is the industry's designation of its National Fish Week, October 29 to November 3. Such items as oysters, shrimp, crab, clams, lobster, salmon, halibut, tuna, sardines, fish sticks, and fillets, as well as other fish will be in good supply although the available quantities of some of

these items will be lower than a year ago. Prices for fresh and frozen fish and shellfish products will be slightly higher, but the general level of canned fish will be somewhat lower.

The quarter should see additional interest resulting from the adoption of voluntary Federal standards for fish sticks and an upturn in that sector of the fishing industry is expected.

Cold-storage stocks are down about seven percent from last year, but supplies are still ample with some items even being in better supply. Landings will follow the seasonal pattern, which means reduced activities in some fisheries.

The Alaska salmon pack (low last year) shows a gain. The Alaska pack as of September 1 this year was 2,819,000 standard cases, a 21-percent increase over the pack of September 1, 1955. The total pink salmon pack was down slightly but increases in the red and chum salmon packs more than offset the loss.

Oyster production will be in evidence on all coasts although the Atlantic oyster beds are still showing the effects of the hurricanes of recent years. But more Pacific Coast oysters will be available. A heavy and growing demand for small oysters from new consumer groups in areas where oysters were formerly not readily available is one reason why supplies will be trailing demand. Prices will probably be somewhat higher.

Shrimp landings up to the end of August were below expectations but September and October are the peak months for shrimp production barring unforeseen weather conditions. Lobster production in Maine was down one third as of July 31 and the landings usually drop sharply during the latter part of the quarter. However, fair supplies for the lobster lovers are expected. Spiny lobster imports and holdings are up. Hard crabs in the East are in moderate or good supply while the production of the Dungeness crabs in California is expected to rise sharply during the

quarter. Surf clam landings in New Jersey are up 26 percent, but Maine soft clam landings are lower by 19 percent.

Canned tuna is in good supply with the pack already 13 percent ahead of the corresponding period of last year. The halibut supply is higher than in 1955 and will be close to 67 million pounds, due to the extended fishing period. Maine sardine production is below normal but higher than in 1955; California expects a fair pack of California sardines.

New England groundfish landings will go into the seasonal decline; cod production is traditionally low in the fourth quarter; haddock landings will hold up until the middle of the quarter when a decided drop can be expected; the downward trend in the harvest of ocean perch has been reversed, but the 1956 catch will be short of the 200-million-pound average for 1950-54.



National School-Lunch Program

Producers and distributors of fishery products are finding that the school-lunch program is a potent market for their products. Not only is it a growing market, but it represents an opportunity to cultivate a taste for fishery products by children during their formative years that will continue as they become the adult customers of the future. A large share of the U. S. Fish and Wildlife Service's educational and market development program consists of giving fish-cookery demonstrations before school-lunch supervisory personnel, to show the variety, versatility, and economy of fishery products in their menu planning.



A U. S. Fish and Wildlife Service home economist conducting a fish-cookery demonstration before school-lunch supervisory personnel, an important part of the Service's educational and market development program.

The school-lunch program is big business. The National School Lunch Program is in operation in over 56,000 schools located in all the 48 states and most of the territories and possessions. During the past school year, around 1.8 billion meals were served to 10.6 million children.

For this coming school year, Congress has appropriated \$100 million. This is an increase of \$16.7 million over last year. Nearly \$84 million of this fund will be apportioned among the states, territories, and possessions, based on the number of children between the ages of 5 and 17, inclusive, and the need for assistance in each state. Each Federal dollar must be matched by \$3 from sources within the state if the per capita income in the state equals or exceeds the national average. The grant-in-aid program is administered in the states by state departments of education in accordance with agreements between those departments and the United States Department of Agriculture.

In addition to the above apportioned funds, \$15 million is available to the Department of Agriculture for the purchase and distribution to schools of foods which help to meet the nutritional requirements of school children. These foods are those which are in extra abundance or oversupply.

Most of the schools participating in the National Program serve a Type A lunch which includes two ounces of protein. If fish were used as the protein for only one meal a week in all the schools, it would require over 1.3 million pounds of boneless fish, such as fillets or canned, to serve the 10.6 million children.



Maine

NEW SARDINE FILM: The Maine Sardine Industry on August 16 started work on a new motion picture, which will be produced in cooperation with the U. S. Fish and Wildlife Service. The film will depict the use for and the home preparation of canned Maine sardines.

The Executive Secretary stated that a contract for the camera work had been let to a New York City firm and that shooting would start as soon as a script was completed and approved by the Maine Sardine Council. The production of the film will be under the direction of the Fish and Wildlife Service.

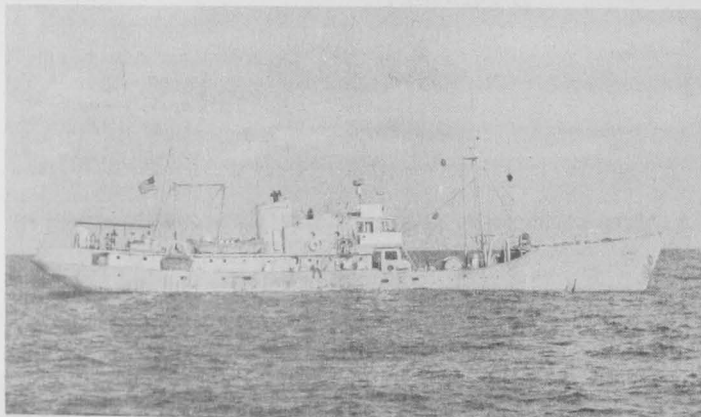
The 16 mm. film will be in full color with sound and will run for about 14 minutes. Approximately 75 copies will be obtained for national distribution. The film will be a follow-up to a previous film (It's the Maine Sardine) produced under the same type of cooperative arrangement.

Maine is to be the locale for much of the camera work and emphasis is to be directed on the convenience, low cost, high protein, and versatility aspects of canned Maine sardines as a food.



North Atlantic Fisheries Exploration and Gear Research

DIFFERENT TYPES OF TRAWL NETS TESTED (M/V "Delaware," Cruise 23 and M/V "Albatross III," Cruise 79): Experiments were conducted on various types of trawl nets in the Georges Bank area on a joint cruise of the Service's research vessel Albatross III and the exploratory fishing vessel Delaware between July 23 and August 4, 1956.



The Service's research vessel Albatross III.

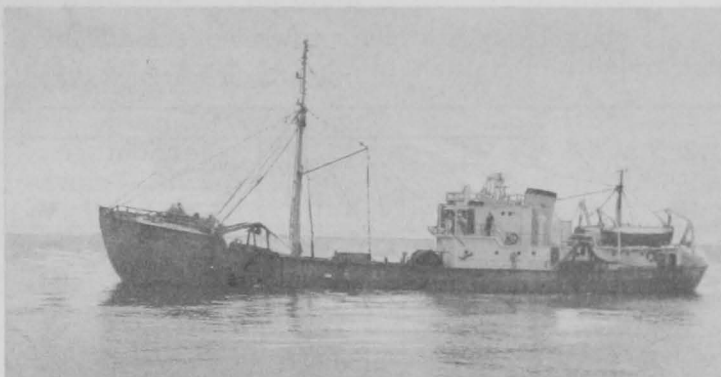
Mission of these tests was: (1) to compare the fishing powers of a high-opening trawl of new design with the trawl net now in standard use by the haddock fishery, and (2) to determine to what degree haddock escape through the meshes of various sections of the trawl.

In order to make the results most valuable and for comparison, the vessels towed the nets used side by side, as close together as possible. The simultaneous tows were conducted in three phases:

(1) Both vessels towing the standard #41 trawl to establish the uniformity of catching power of the nets of the two vessels. The catches of haddock by the two nets were found to be virtually uniform.

(2) The Albatross III towing the standard #41 trawl and the Delaware towing the special "Balloon"-type #41 trawl. Significantly lower catches of haddock were made by the "balloon" trawl.

(3) The Delaware towing the standard #41 trawl; the Albatross III towing a standard #41 trawl with large and small mesh in various sections of the net. The lower wings and bellies were found to be much more important in the escapement of haddock through the meshes than were the top wings and square.



The Service's research vessel Delaware.

Phase three was divided into three series of simultaneous tows with the standard 5-inch mesh #41 net of the Delaware and the 2½-inch mesh #41 net of the Albatross III. Sections of 2½-inch mesh were replaced by 5-inch mesh to determine escapement from various sections of the net. Both nets had 2⅞-inch cod ends. The following groups of tows were made:

- a. Seven simultaneous tows with the complete 2½-inch mesh trawl.
- b. Four simultaneous tows of the 2½ inch mesh trawl with 5-inch lower wings.
- c. Four simultaneous tows of the 2½-inch mesh trawl with 5-inch lower wings, top belly, and lower belly.

The catches are summarized for each net for the three series of tows in the following table:

Length of Fish by 3-cm. Groups	a.			b.			c.		
	No. of Fish		Percentage	No. of Fish		Percentage	No. of Fish		Percentage
	<u>Albatross</u>	<u>Delaware</u>	of <u>Albatross</u>	<u>Albatross</u>	<u>Delaware</u>	of <u>Albatross</u>	<u>Albatross</u>	<u>Delaware</u>	of <u>Albatross</u>
18 & 21	68	8	12	25	9	35	39	40	103
24	951	318	33	370	227	61	218	324	149
27	3,541	1,705	48	1,733	1,508	87	1,205	1,403	117
30	3,041	1,801	59	1,736	1,798	104	1,355	1,941	143
33	780	319	41	508	548	108	477	628	132
36	734	576	78	459	363	144	926	748	81
39	972	1,069	110	563	832	148	1,193	1,109	93
42	515	770	150	311	505	162	803	859	107
45	141	241	171	104	206	198	229	336	147
48	27	52	193	21	31	148	95	94	99
51 to 66	20	66	330	38	30	79	92	61	66
Totals	10,790	7,185	-	5,869	6,357	-	6,632	7,543	-

The 5-inch mesh used in the forward parts of the trawl averaged about 4¾ inches, internal measurement. The 2½-inch mesh averaged 2½ inches, internally. The 2⅞ inch cod ends averaged 2½ inches internally.

The results show that many small-size haddock escape through the lower wings and bellies. The top wing and square appear to be unimportant for the escapement of haddock. Smaller catches of larger fish were made with the 2½-inch trawl, indicating that the small-mesh net was not fishing as effectively as the 5-inch trawl.

In addition to the 64 simultaneous tows made by the two vessels, the Albatross III made 53 additional tows, comprising phases 4, 5, and 6 of the Albatross III operations.

In phase four alternate tows were made by the Albatross III with complete $2\frac{1}{2}$ -inch mesh and 5-inch mesh #41 trawls to compare alternate tow and simultaneous tow (phase three) methods.

Lengths of Fish by 3-in. Groups	Number of Fish		
	$2\frac{1}{2}$ -in. Trawl	5-in. Trawl	Percentage 5-in. Trawl of $2\frac{1}{2}$ -in. Trawl
15 - 21	89	69	78
24	220	165	75
27	424	360	85
30	350	464	132
33	453	391	86
36	791	777	93
39	777	825	106
42	479	565	118
45	302	400	132
48	232	225	97
51 - 75	372	393	106
Total	4,489	4,634	-

Both nets had $2\frac{7}{8}$ -inch cod ends. The pairs of alternate tows gave widely varying results, as was expected. A summary of catches by the $2\frac{1}{2}$ -inch and 5-inch trawls is given in the table.

Although extreme tow-to-tow variations caused results to be less reliable than the simultaneous tow data, it is shown that escapement takes place through the forward parts of the net.

Phase five was conducted to determine which part of the cod end was most effective for the escapement of haddock. The forward parts of the net were therefore unchanged during phase five, which consisted of four series of tows with a $4\frac{3}{4}$ -inch (internal size) double-manila cod end with cover arranged as follows:

- Covering the full length of the cod end (44 meshes).
- Covering the after 22 meshes of the cod end.
- Covering the after 16 meshes of the cod end.
- Covering the after 11 meshes of the cod end.

The 50-percent point of the $4\frac{3}{4}$ -inch cod end with full cover (a.--9 tows) was about 36 cm. This was 3 cm. lower than would be expected, due to certain characteristics of the twine.

With the cover over the after 22 meshes (b.--4 tows) and the after 16 meshes (c.--2 tows), the 50 percent point was unchanged. When moved down to cover only the after 11 meshes (d.--3 tows) the 50 percent point was lowered to about 34.5 cm.

Length of Fish by 3-in. Group	Number of Fish in		Percentage Retained in Wire-Mesh Cod End	Percentage Retained in a Standard $2\frac{7}{8}$ -in. Cod End
	Cover	Cod End		
18	5	0	0	4
21	40	16	29	18
24	87	43	33	43
27	47	77	62	79
30	5	58	92	97
33	1	107	99	99
36 - 54	0	331	100	100
Total	185	632	-	-

It was thus demonstrated that most escapement takes place in the after quarter of the cod end under loads up to 2,000 pounds.

Phase six was conducted to determine if sharper selection could be obtained by using a cod end of rigid wire netting in which only slight variation in mesh size existed. A 7-foot long section of the wire mesh was put into the cod end from laceage to laceage in the effective escape area (near the after end) of a $2\frac{1}{4}$ -inch mesh covered cod end. The wire was of diamond shape, measuring $2\frac{7}{8}$ inches in length and $2\frac{5}{8}$ inches in width. The number of fish caught in the wire-mesh cod end and cover are shown in the table.

The percentages retained are shown in comparison with the percentage retention of a standard double-manila cod end of approximately equivalent size. The wire-mesh cod end shows rather duller selection than a standard manila cod end.

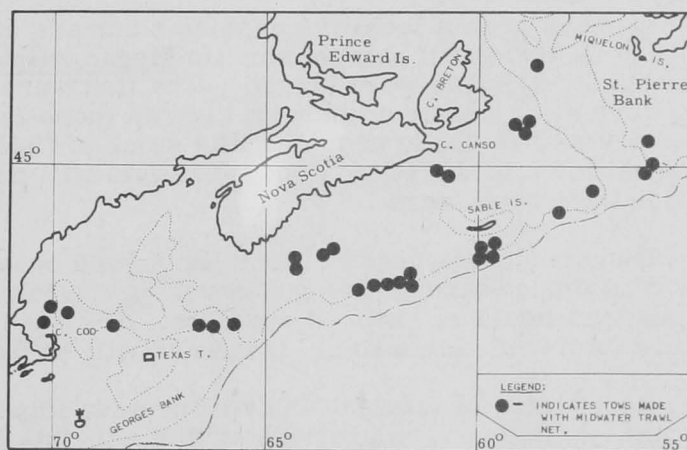
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MIDWATER TRAWLING BY M/V "DELAWARE" FROM GEORGES BANK TO ST. PIERRE BANK YIELDS NO FISH (Cruise 24 and 25): Experimental midwater trawling by the exploratory fishing vessel M/V Delaware in an area from Georges Bank to St. Pierre Bank yielded no commercial quantities of ocean perch. During the two cruises (cruise 24--5 days; cruise 25--16 days), 32 tows in the midwater area from near the surface to depths of 228 fathoms failed to produce fish though indications were that the Service's nylon and manila midwater trawls were working satisfactorily.

During the cruises considerable time was spent searching for midwater schools of fish, but no indications of fish in midwater were obtained by the two electronic fish-finding devices installed aboard the Delaware. Previous experience has shown that unless the echo-sounding or fish-finding devices record concentrations of fish or other marine life in the midwater areas, the chances for successful catches in midwater are very slight.

On three short tows the midwater trawl was intentionally set on the bottom. One tow caught 350 pounds of ocean perch and a few cod and gray sole. Midwater trawling in the same area during day and night yielded no ocean perch. Two other bottom sets caught small quantities of northern shrimp (Pandalus borealis).

Two midwater trawls of different designs were used during the cruises. One, an all-nylon net of 4½-inch mesh in the wings, 3-inch mesh in the cod end, and a 50-foot square mouth opening. The second net, all manila, 6-inch mesh wings, 3-inch mesh in the cod end, and a 65-foot square mouth opening. Side-setting midwater trawl gear presented problems, but after modifications of the net and doors the gear was operated successfully.



M/V Delaware Cruise 25 (Aug. 13-Sept. 6, 1956).

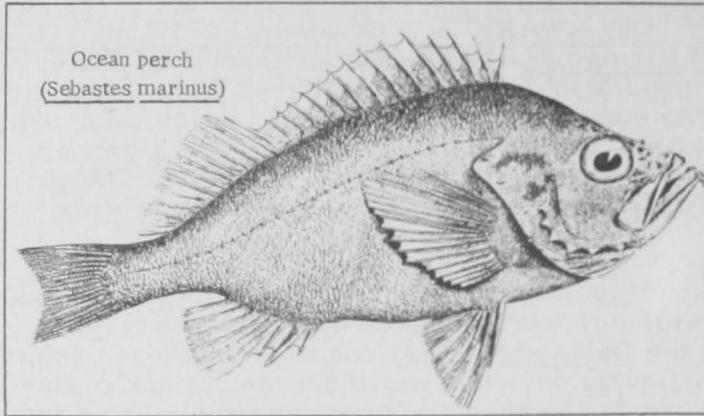
The electronic depth telemeter was used on all midwater tows and allowed for accurate depth-positioning of the midwater net. This prototype instrument developed for the Service by the University of Miami Marine Laboratory has proved to be very serviceable.

Deep-water exploratory trawling for ocean perch along the edge of the continental shelf south of Georges Bank was to be the objective of the Delaware during an 11-day trip scheduled to begin September 25, 1956. The area from 100 to 300 fathoms will be explored by the Delaware, principally in locations where possible commercial concentrations of ocean perch were indicated during recent cruises for deep-water lobster. Two types of nets were to be used, a standard #41 and a "balloon" trawl. Several tows were to be made using a 16-tooth rocking chair-type dredge in the shallower areas of Georges Bank as limited preliminary exploratory work on the commercial possibilities of an offshore shellfish resource.



North Atlantic Fisheries Investigations

BIOLOGISTS TAG FIRST OCEAN PERCH: Due to a strange occurrence of deep-sea ocean perch near the surface at Eastport, Me., biologists from the Woods Hole Laboratory of the U. S. Fish and Wildlife Service were able to initiate a successful tagging program early in August. Numbered plastic discs were inserted on the cheekbones of 317 fish in the first phase of the program.



Ocean perch normally occur in depths of 40-200 fathoms, and are fatally bloated when brought to the surface as a result of the extreme change in pressure. Consequently, no fish can be tagged which are caught by commercial trawlers. The biologists have been considering various schemes for tagging the fish without bringing them to the

surface, such as the use of detachable marked hooks. Before embarking on a program involving complicated procedures, however, they decided to investigate persistent rumors that ocean perch occur near the surface in late summer at Eastport, Me.

A check at this locality revealed hundreds of ocean perch feeding at or near the surface on the small pelagic shrimp *Meganyctiphanes*. In three days of hook-and-line fishing 317 fish were tagged. The fish were in excellent condition when released and were at or near commercial size so there is every reason to believe some recoveries will be made provided this stock of fish moves into commercial fishing grounds later in the year. The biologists will continue their work until thousands of fish have been tagged.

Fishermen are urged to look for tagged ocean perch. The tag is a brilliant yellow disc pinned through the gill cover on the left side of the fish. The fish as well as the tag should be saved if possible. Any Fish and Wildlife agent may be notified upon capture of such a fish. A reward will be paid.

Recoveries of marked fish will provide important information on the growth rate, mortality rates, and migrations of this valuable food fish in the North Atlantic.

* * * * *

MATERIALS FOR GROUND FISH FOOD HABITS STUDY COLLECTED BY M/V "ALBATROSS III" (Cruise 80): To collect materials on Georges Bank for a study of the benthic fauna and the food habits of groundfish was the purpose of cruise 80 (August 9-17) of the Service's research vessel *Albatross III*.

Bottom fauna samples and stomachs from groundfish were obtained at seven widely-spaced locations on or adjacent to Georges Bank. The areas represented were: Southwest Part, Southeast Part, Northeast Peak, Northern Edge, Central Georges, Georges Basin, and South Channel. Fish were taken with a No. 36 otter trawl fitted with a $\frac{1}{2}$ -inch (expansion measure) mesh liner. Haddock, cod, butterfish, whiting, herring, and red hake were the principal species caught. A few specimens of 13 other species were taken. Stomachs from all species were dissected out and retained for study.



Service's research vessel *Albatross III*.

The sedentary and slow-moving bottom organisms were taken by means of the Smith Sampler, Digby scallop drag fitted with a fine mesh liner, and a sled-mounted ring net. All collections were preserved and brought to the laboratory for analysis.

The analysis of these samples will be made to determine whether or not haddock are selective in their feeding and to determine the relationship of food organisms to the distribution of haddock.

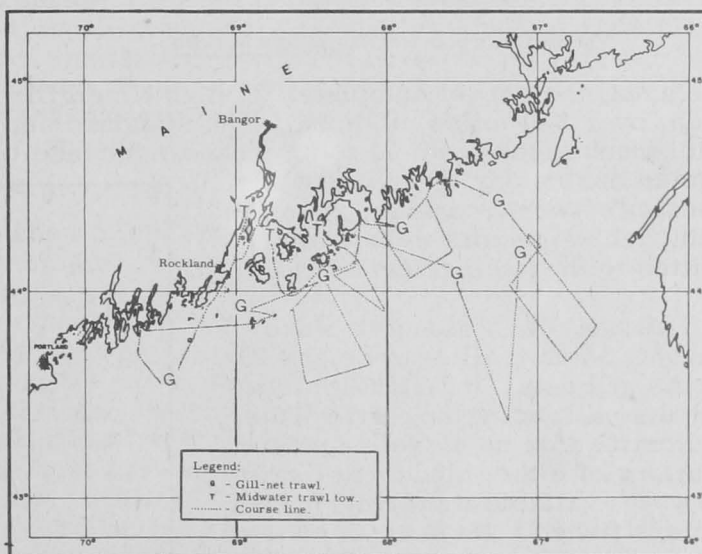
The vessel's next cruise will start September 14. On this trip the 1956 survey will be made to determine the extent and distribution of the new haddock year-class (1956) on the bottom.



North Atlantic Herring Research

COASTAL WATERS OF EASTERN GULF OF MAINE EXPLORED FOR HERRING BY M/V "METACOMET" (Cruise 5): Scouting and fishing the coastal waters of the eastern part of the Gulf of Maine to learn if herring (particularly of sardine size) were present at this time was the principal purpose of Cruise 5 (August 1-10, 1956) of the M/V Metacomet, a Fish and Wildlife Service chartered exploratory fishing vessel.

Results of the cruise were largely negative. Only very small catches of herring were made in herring gill nets. Three different methods of setting gill nets were used: (1) "anchored sink gill nets" set on the ocean bottom; (2) "anchored floating gill nets" which were suspended 12 feet deep from large surface floats but held in a fixed position by anchors at each end; and (3) "drift gill nets" which were suspended 12 feet deep from surface floats, drifting freely during the night with one end attached to the drifting Metacomet. Herring brit were located on the depth-sounder and sampled in Blue Hill Bay and Penobscot Bay on August 8 and 9 when weather prevented setting gill nets in outside waters.



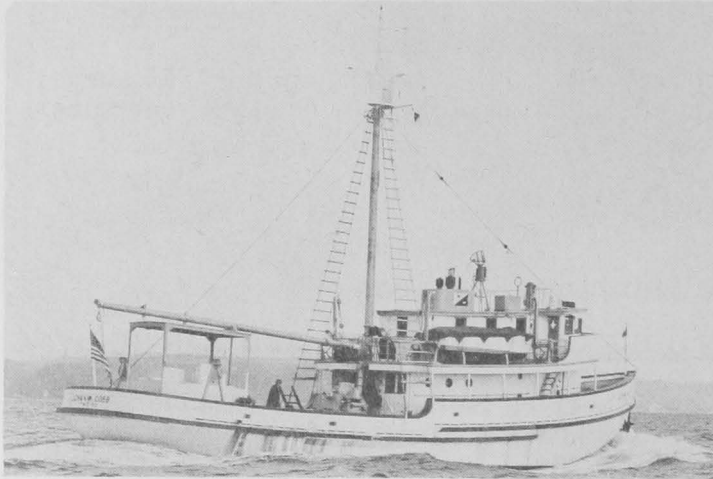
Cruise 5 of Fish and Wildlife Service chartered vessel Metacomet.

Cruise No. 6 of the Metacomet was scheduled for August 17 through 27. The objective is to make a thorough survey of the inside waters along the Coast of Maine from Passamaquoddy Bay to Casco Bay for 0-year-class herring "brit" which may become available as sardines during the autumn months. The depth-sounder will be used to locate fish and midwater trawl gear will be used for fishing.



North Pacific Exploratory Fishery Program

ALBACORE TUNA AND SALMON DISTRIBUTION IN OFFSHORE WATERS STUDIED BY "JOHN N. COBB" (Cruise 28): Distribution of albacore tuna and salmon in offshore waters from northern California to southern British Columbia was investigated during a 7-week cruise by the Service's exploratory fishing vessel John N. Cobb, which returned to Seattle on August 30.



The Service's research vessel John N. Cobb.

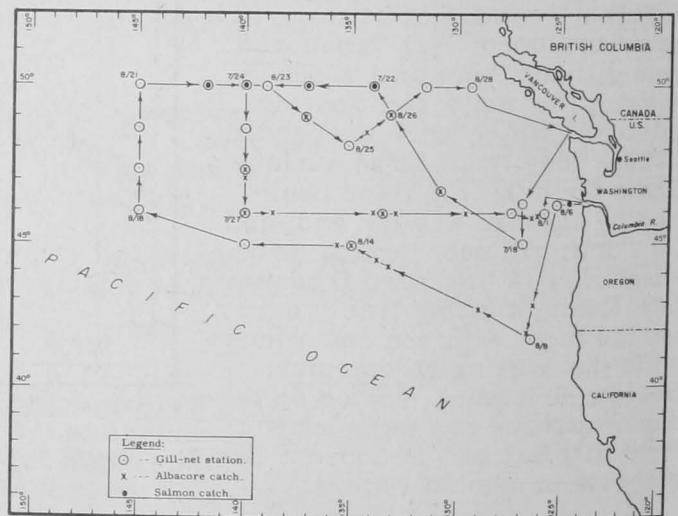
the area, the vessel completed 27 nighttime gill-net stations out to 145° W. longitude, over 800 miles offshore. The standard set was 900 fathoms of nylon gill net with mesh sizes from $3\frac{1}{4}$ to $8\frac{1}{2}$ inches. Surface trolling with 6 or 7 lines was conducted during daylight hours while running between stations. Significant fishing results were transmitted to the fishing fleet by radio.

A total of 63 albacore were caught, 38 on trolling gear and 25 in the gill nets. Individual catches were small during the entire cruise, indicating that no sizable concentrations of either albacore or salmon were available at the time in the waters fished. No schools of either species were seen. The first catch of albacore was made in gill nets July 20 near the Seamount about 270 miles west of Grays Harbor. Best albacore catches were made on July 29 when nine fish were taken trolling near 46° N., 134° W. and nine were caught in the gill nets that night about 20 miles eastward. Five red salmon and two silver salmon were caught at four of the northernmost gill-net stations. One steelhead trout was taken along with 2 red salmon in the gill nets on July 22 at 50° N., $133^{\circ} 58'$ W.

Several other species of fish, mostly jack mackerel, pomfret, and blue shark were present in most gill-net catches. Up to 206 pomfret, 148 jack mackerel, and 31 blue shark were taken in individual catches. On July 27, the gill nets caught 97 large squid from $2\frac{1}{2}$ to 3 feet in length at 46° N., 140° W. Night-light fishing produced numbers of small squid, saury, and lantern fish, all important items of albacore food in these waters.

Results of the exploratory fishing with surface gill nets and trolling gear showed that albacore were widely distributed off Oregon and Washington from 80 to 600 miles offshore. Salmon were caught offshore only at four gill-net stations along 50° N. latitude, and none were taken south of this line except for one silver salmon caught on albacore trolling gear about 20 miles off the Columbia River. No albacore were caught north of $49^{\circ} 06'$ N. latitude.

Following a prearranged schedule to insure adequate coverage of



M/V John N. Cobb, Cruise 28 (July 16-August 30, 1956).

The John N. Cobb's work was coordinated with a cruise of the University of Washington's oceanographic research vessel Brown Bear, and the two vessels worked in close conjunction much of the time. Simultaneously the John R. Manning from the Pacific Oceanic Fisheries Investigations conducted albacore research west of 145° W. longitude, adjoining the area covered by the John N. Cobb. Oceanographic and biological data will be compared with the fishing results to learn as much as possible of the movements and other habits of albacore, how they are affected by changes in the ocean, and why their availability to the fishermen fluctuates so greatly.

Following the early albacore catches by the John N. Cobb and the Brown Bear, the commercial fleet in mid-August found schools of albacore close-in to the Oregon coast, and good fishing was reported by a number of vessels. This is the first year since 1950 that any appreciable numbers of albacore have been caught north of California.



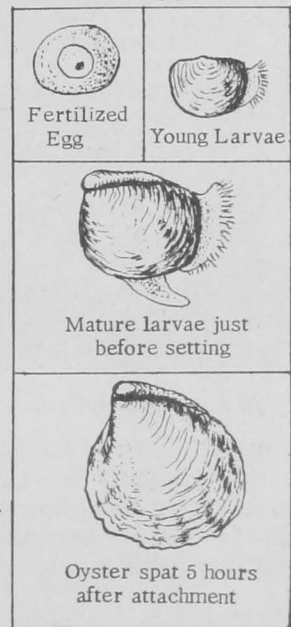
Oysters

SUMMER 1956 SET IN CHESAPEAKE BAY AREA: Each season records of the time and intensity of oyster setting and of the attachment of fouling organisms in certain areas are obtained by the Chesapeake Biological Laboratory of Maryland's Department of Research and Education, through exposure of test shells. Experience has shown that hardly ever does the first oyster spat of the season appear before the first of June and none have been recorded later than the month of October. Hence, at most stations where the time and setting rate of spat are measured, shells are exposed only during the above period.

A few scattered spat were attached to shells at most stations during the first part of this summer. Usually a peak of setting occurs in certain areas in late June or July, sometimes followed by one or more later peaks. At some stations, especially in the Solomons area, the light set occurs most often during the fall. St. Marys River, the upper Honga River, both sides of the Bay just above Solomons, and the Patuxent River all had received only a few scattered spat this year from early June to mid-July although the first named areas usually have good accumulations by that time. Scattered data indicate that little set occurred during this same period in Holland Straits and Piney Island Swash. Smith Creek, however, produced a fair set during the week of June 28-July 5 that amounted to about 10 spat per shell face. This rate of setting had diminished to very few spat during mid-July.

Even an initial set of ten or more spat per shell face at an age of one week does not insure that many will survive the perils of a microscopic oyster's early life.

Shells that have been planted for a longer period prior to the set may also be quite foul and so offer little suitable space for spat attachment. Of course, when only a few spat attach initially, the number of surviving set must remain small. Typically, light sets, such as have occurred so far this season, show a much better rate of survival than do more densely-crowded sets. It is still too early to predict just how successful this season's oyster set may be, for later peaks of more intensive setting may occur. Only Smith Creek so far has had enough potential spat-fall to produce a good crop if commercially planted shells were clean and the rate of survival high.



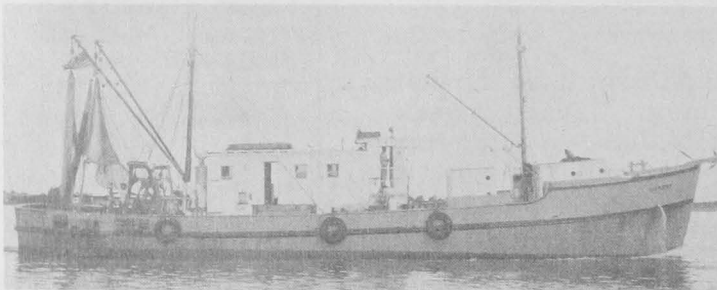
While the amount of spat found on clean test shells exposed each week does not give an accurate picture of the crop to be found on commercially-planted shells by late fall, it does offer a means of getting the maximum possible attachment from the set that occurs. Experiments have shown that shells planted just prior to a peak of oyster setting sometimes may obtain two or more times as many spat as shells that have been overboard for several weeks prior to the set. This is due to the shell's cleaner surfaces at the time of spat-fall. In some areas a heavy wave of barnacle setting often occurs in late spring or even in early June that can render shells almost useless for spat attachment when the oyster set occurs.

A number of years of observation in a given area sometimes may reveal a rather consistent pattern of oyster setting so that a normal date can be picked when shell planting may be done only a short time before the oyster setting peak is most likely to occur. Observations by test shells also may reveal places that seldom obtain significant sets at any season and others that usually produce a high rate of setting. Some use of such observations has been made in shell planting, but in large-scale operations it is not always possible to get all of the shells over at the optimum time even when this is fairly well designated, the July-August 1956 Maryland Tidewater News points out.



South Atlantic Exploratory Fishery Program

ROUND-THE-CLOCK TRAWLING BY M/V "COMBAT YIELDS EXCELLENT CATCHES OF RED SHRIMP (Cruise 4): Round-the-clock trawling by the M/V Combat off St. Augustine in depths of 175 to 210 fathoms yielded excellent catches of



M/V Combat chartered for South Atlantic Fisheries Exploration.

deep-water red shrimp (Hymenopenaeus robustus). A total of 4,200 pounds of heads-on shrimp (21 boxes, headless) were caught in 16 drags, using a 40-foot flat trawl. Twenty-two drags of 3- to 4-hour duration were made during a 4½-day fishing period. Six of these tows failed to reach bottom, and no catch was made.

The M/V Combat, a 96-foot wood hull shrimp vessel powered with a 500-hp. Diesel engine, was chartered by the U. S. Fish and Wildlife Service in July for continuation of offshore shrimp exploration along the South Atlantic coast initiated by the chartered vessel Pelican in March 1956. The Combat is rigged with a large heavy-duty winch, stern davits, and is equipped with immersion-type shrimp-freezing apparatus.

First successful attempts to trawl in deep water against the Gulf Stream current were made during a 6-day shakedown cruise, July 26-31, on smooth bottom southeast of St. Augustine. Ground speeds of 2.5 to 3.5 knots were determined to produce the best fishing results while towing countercurrent. A minimum ground speed of 4 to 4.5 knots can be obtained towing with the current.

The subsequent round-the-clock fishing (August 6-11) was confined to an area off St. Augustine where previous work by the M/V Pelican revealed promising concentrations of red shrimp. Drags were alternately run with the current and countercurrent. The best catch yielded 560 pounds of shrimp, from a 4-hour countercurrent drag. The remaining 15 successful drags caught from 200 to 450 pounds of heads-on shrimp. The catch averaged 25 count headless.

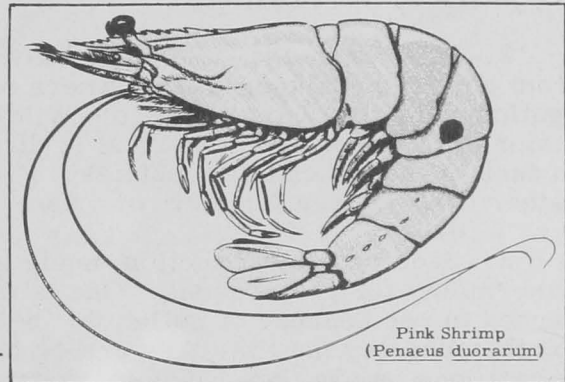
Highest concentrations were found immediately below 29° 58.5' north latitude, in 175 to 190 fathoms. To the north of this point rock and coral bottom constitute a major trawling hazard.

The Combat is scheduled to depart Jacksonville on August 14 to continue fishing operations in the same general area. During this trip 80-foot balloon trawls will be used to obtain information on potential commercial catch rates. Also, a series of exploratory drags will be made between the 10- and 50-fathom curves southeast of Mayport, to determine the extent of offshore movement of brown shrimp stocks presently being fished in that area.

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EXPERIMENTAL SHRIMP TRAWLING IN KEY WEST-TORTUGAS AREA BY "GEORGE M. BOWERS" (Cruise 6): Small amounts of pink shrimp (Penaeus duorarum) were taken fishing just off the bottom, and trace amounts in three midwater tows by the Service's gear research vessel George M. Bowers during a 15-day experimental shrimp trawling cruise in the Key West-Tortugas area off southern Florida. The vessel, which completed its trip on August 30, made 50 drags of one to three hours with 40-foot and 20-foot flat trawls on the bottom, off the bottom, and in midwaters.

Ten drags fishing on the bottom among boats of the fleet in 11- to 20-fathom depths resulted in catches ranging from individual shrimp to 10 pounds (heads off) an hour. Fishing in the same area with the trawl rigged to fish 2-2½ feet off the bottom resulted in catches ranging from individual shrimp to three pounds an hour.



Fishing off the bottom was also conducted in bad bottom areas known as "The Loggerheads," in depths of 11 to 30 fathoms. Ten tows were completed in this area with catches ranging from individual shrimp to two pounds an hour. Larger individual shrimp were taken in the deeper waters (23 to 30 fathoms) with individuals ranging from 6 count to 20 count. On five additional tows quantities of sponge and invertebrates (to 200 pounds) were taken in bad bottom areas when the net touched bottom. Gear damage was slight.

A total of 25 tows were made with 40-foot and 20-foot trawls in midwaters at distances ranging from 2 to 5 fathoms above the bottom in depths ranging from 11 to 30 fathoms. One, two, and three individual pink shrimp (16-20 count, heads off) were taken on three tows with the trawl a calculated two fathoms above the bottom. These tows were made just northeast of Tortugas in 16 to 17 fathoms of water.

Two biologists from the University of Miami Marine Laboratory participated in the cruise for continuation of cooperative experiments with trawl savings gear. Studies are being conducted to test the survival of shrimp escaping through cod-end meshes in the Tortugas fishery. Shrimp caught in the cod-end cover bags were held in aquaria aboard the research vessel to determine extent of injury in escape-ment through meshes. Results of the tests will be announced by the Marine Laboratory when analysis has been completed.



South Carolina

OYSTER LAWS REVISED: Oyster law revisions by the last General Assembly of South Carolina present new opportunities for profit, while promoting the growth of the oyster industry, in the opinion of the Chairman of the State's Wildlife Resources Commission.

The new oyster code repealed 24 sections and amended 14 more into a compact 20-section body of law, points out the summer 1956 issue of South Carolina Wildlife.

Perhaps the most important features of the revision are these:

1. Owners and lessees of oyster bottoms are encouraged to improve their beds because the new law protects the oysters from public harvest. As the law stands now, an owner or lessee need only post his oyster beds as prescribed in the statute to make it illegal for persons to enter upon and harvest without authority. Penalties are provided for violations.
2. Formerly, the "two-bushel law" allowed anybody to take oysters freely even from private beds upon which owners or lessees had spent money and effort in propagation and cultivation. Now, the Wildlife Resources Commission (through the Division of Commercial Fisheries) is directed to establish and maintain "oyster farms" in each of the six coastal counties. From these beds the public will be entitled to gather oysters free for their own use.
3. Seed oyster production, made legal by the new law, should become profitable rapidly for two reasons. One is that seed oysters may be grown on beds now barred to use because of pollution. Seed oysters must be taken up and transferred to other beds by the time they are $1\frac{1}{2}$ inches long. Thus, they will cleanse themselves long before they reach marketable size. Oyster shores, especially around Charleston and Beaufort, have been seriously curtailed by pollution. This will put them back to profitable work. Moreover, there is a serious and growing need for new seed oyster sources for Chesapeake Bay and Long Island waters. South Carolina is capable of producing two crops of seed oysters every year.
4. The rights of landowners adjacent to oyster beds not under lease to preference in leasing now is limited to two acres each. Formerly, there was no limit specified.
5. A new leasing right up to four acres was instituted for persons or corporations not engaged in commercial oyster culture.
6. Lessees must show by the end of three years that they have "Effectively cultivated the area or face forfeiture of the lease, after due notice and a hearing."



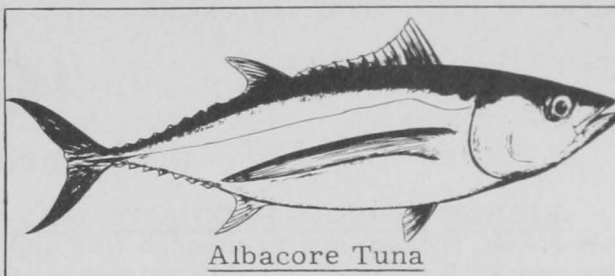
Tuna

ALBACORE BEING SOUGHT OFF OREGON-WASHINGTON COAST: "We ran into some fish but not in concentrations heavy enough to support a commercial fishery," reported one of the two Oregon Fish Commission biologists who have been aboard the Brown Bear, University of Washington oceanographic research vessel, for the past three weeks in a large-scale search for albacore tuna off the Oregon-Washington coast. The Brown Bear and a companion vessel, the John N. Cobb, exploratory fishing vessel operated by the U. S. Fish and Wildlife Service, were in Astoria on August 3 for a brief pause in a seven-week hunt for albacore and facts that may influence the distribution of these fish in Northwest offshore waters.

In all, 72 albacore were caught by the two ships during this first phase of the cruise--28 by the Brown Bear and 44 by the John N. Cobb. All fish caught by the Brown Bear were taken on feathered jigs, but the John N. Cobb took 20 tuna with gill nets. Most of the albacore were caught from 300 to 400 miles offshore. When albacore supported a substantial commercial fishery off Oregon between 1938 and 1950, the fish were caught in large numbers as close as 50 miles off the coast. Oregon's albacore catch hit a peak of 22.5 million pounds in 1944.

The Fish Commission biologist said food fish and plankton utilized by albacore were fairly abundant but were found in widely scattered groups. Considerable numbers of mackerel-like sauries, regarded by biologists as a prime item on the albacore menu, were sighted during the cruise.

Both vessels departed from Astoria August 6 for the second lap of the investigation in open waters off southern Oregon and northern California. The prospects for locating larger schools of albacore appear to be better for this leg of the trip because:



1. Another U. S. Fish and Wildlife Service research vessel, the John R. Manning, caught over 30 albacore in the general vicinity last year.
2. The Brown Bear and the John N. Cobb will be fishing in waters closer to areas where albacore are regularly taken in commercial quantities.
3. Biggest albacore catches were made in August when a fishery existed off Oregon and Washington.

The research vessels plan to continue to maintain radio contact with commercial fishing vessels and relay any news of sizable schools of albacore that might be encountered. A total of over 3,500 miles will be covered during this summer's albacore investigation which has been coordinated by the Pacific Marine Fisheries Commission.



United States Fishing Fleet^{1/} Additions

JULY 1956: First documents as fishing craft were issued for 68 vessels of 5 net tons and over during July 1956, according to the Bureau of Customs. This was 15 vessels more than for the same month of 1955. The Chesapeake Bay States led

Table 1 - U. S. Vessels Issued First Documents As Fishing Craft, by Areas, July 1956 and Comparisons

Area	July		Jan. - July		Total
	1956	1955	1956	1955	
	(Number)				
New England	1	5	10	15	18
Middle Atlantic	4	-	19	9	13
Chesapeake	23	3	66	27	54
South Atlantic	12	10	61	40	65
Gulf	10	7	65	55	103
Pacific	14	26	62	86	117
Great Lakes	-	-	2	5	9
Alaska	4	2	31	25	35
Hawaii	-	-	-	2	3
Virgin Islands	-	-	-	-	1
Total	68	53	316	264	418

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, July 1956

Net Tons	No.
5 to 9	31
10 to 19	14
20 to 29	8
30 to 39	3
50 to 59	2
100 to 109	1
110 to 119	1
120 to 129	4
130 to 139	1
150 to 159	2
180 to 189	1
Total	68

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

^{1/} Includes both commercial and sport fishing craft.

with 23 newly-documented craft, followed by the Pacific area with 14, the South Atlantic with 12, the Gulf with 10, and the Middle Atlantic area and Alaska with 4 each. New England was credited with 1 newly-documented vessel.

The Chesapeake Bay area showed the greatest increase in vessels issued first documents during July 1956 with 20 vessels more than were reported for July 1955. The South Atlantic and Gulf also had increases while the Pacific area showed a decrease of 54 percent as compared with the same month in 1955.

During the first seven months of 1956, a total of 316 vessels was documented for the first time as fishing craft--52 more than the number reported for the same period of 1955. This represents an increase of 20 percent.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MAY-JUNE 1956: United States imports of edible fresh, frozen, and processed fish and shellfish in June rose 3.2 percent in quantity and 13.9 percent in value as compared with May 1956. Compared with June 1955

Item	Quantity					Value				
	June		May		Year	June		May		Year
	1956	1955	1956	1955	1955	1956	1955	1956	1955	1955
	... (Millions of Lbs.)					... (Millions of \$)				
Imports:										
Fish & Shellfish:										
Fresh, frozen, & processed ^{1/}	58.4	56.8	56.6	57.1	769.9	19.7	17.3	17.3	17.1	206.4
Exports:										
Fish & Shellfish:										
Processed ^{1/} only (excluding fresh & frozen)	6.5	3.6	4.7	7.9	91.0	1.3	0.9	0.9	1.4	21.6

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

the imports for June 1956 decreased 5.0 percent in quantity, but were 8.2 percent higher in value. June 1956 imports averaged 33.7 cents a pound as compared with 30.0 cents a pound for the same month in 1955 because there were

more imports of canned salmon, canned lobster and spiny lobster meat, and canned crab meat.

Imports of edible fresh, frozen, and processed fish and shellfish in May 1956 decreased about 15.5 percent in quantity and 2.3 percent in value as compared with April 1956. Compared with May 1955 the imports for May 1956 decreased one percent in quantity, but were 1.2 percent higher in value. The dollar value in May 1956 was close to 30.6 cents a pound, compared with 29.9 cents a pound in May 1955. The higher valuation in May 1956 compared with May 1955 was probably due to increases in the imports of canned salmon and crab meat which have a high dollar value.

Exports of processed fish and shellfish in June 1956 rose almost 38 percent above the previous month and 81 percent above the same month in 1955. The July 1956 value of these exports kept pace with the increase in quantity and went up 44 percent as compared with the previous month and the same month a year earlier. Increased exports of canned sardines were principally responsible for the spurt in processed fish and shellfish exports.

Exports of processed fish and shellfish in May 1956 increased about 24 percent from the April 1956 total, but were down 41 percent from May 1955. The value of exports in May 1956 increased 13 percent when compared with April 1956 but was 36 percent below May 1955.

GROUND FISH FILLET IMPORTS DROP 6 PERCENT IN AUGUST: Imports of groundfish (including ocean perch) fillets during August 1956 of 11.3 million pounds were 6 percent less than the 12.0 million pounds imported during the corresponding month of last year. The drop, which was caused primarily by less imports from Canada, offset the 1.7-million-pound increase from Iceland. Imports from Denmark, the Netherlands, West Germany and Miquelon and St. Pierre were also somewhat larger.

Canada continued to lead all other countries exporting groundfish fillets to the United States with 8.6 million pounds during August 1956--76 percent of the total groundfish fillet imports during the month.

Total groundfish and ocean perch fillet imports into the United States during the first eight months of 1956 amounted to 93.9 million pounds as compared with 87.3 million pounds during the same period of 1955. Canada, with 68.1 million, led all other countries exporting fillets to this country during that period, followed by Iceland (17.4 million pounds), and West Germany (1.7 million pounds).

Note: See Chart 7 in this issue.

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IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-JUNE 1956: Fresh and frozen tuna imports for the first six months of 1956 totaled 67.1 million pounds, 8 million pounds less than in the same period of 1955. Albacore tuna imports during this period amounted to 20.7 million pounds as compared with 34 million pounds in the first six months of 1955. "Other tuna" imports totaled 46.6 million pounds, a gain of 5.3 million pounds over the same period in 1955. This year Japan shipped in considerably more frozen "other tuna" than last year, while Peru shipped in substantially less.



Canned tuna imports for the first six months of 1956 reached 18.2 million pounds, about 4.3 million pounds more than in that period of 1955. Canned bonito imports of 8.2 million pounds during the first six months of 1956 were 1 million pounds less than in the same period of 1955.

Canned salmon imports during January-June 1956 totaled 11.1 million pounds while in the first six months of 1955 only 1.2 million pounds were imported.

Canned sardine imports for the first six months this year totaled 9.1 million pounds as compared with 10.4 million in the comparable period of 1955.

Fresh and frozen salmon imports for the first six months of 1956 amounted to 2.4 million pounds, 3.1 million pounds below the same period of a year ago.

Shrimp imports (fresh, frozen, canned, and dried) for the first six months of 1956 amounted to 31.9 million pounds, an increase of 11 million pounds over the same 1955 period. Imports from Mexico, Panama, Ecuador, and Japan were up.

Fresh and frozen lobster and spiny lobster imports for the first six months of 1956 amounted to 27.8 million pounds as compared with 26.9 million pounds for the same period a year earlier. Canned lobster imports for the first six months of 1956 of 1.8 million pounds were less than the 2.0 million pounds imported in the same period of 1955.

Canned crab meat imports for the six months of 1956 of 2.6 million pounds were almost a million pounds greater than for that period of 1955.

Groundfish fillet (including blocks and slabs) imports for the first six months of 1956 amounted to 63.4 million pounds, compared with 61.4 million pounds for the similar period a year ago. Of the total, fillet blocks and slabs imported during the first six months of 1956 amounted to 15.4 million pounds, over 10 million pounds less than for the like period of 1955.

Other fillets than groundfish imported during the first six months of 1956 totaled 29.3 million pounds, compared with 27.5 million pounds in the 1955 period with the principal gain in flounder and fresh-water fish fillets.

Fish meal imports January through June 1956 reached 59,726 tons as compared with 55,267 tons for the comparable period of 1955.

Canned salmon exports for the first six months of 1956 were 0.7 million pounds as compared with 4.4 million pounds in that period of 1955.

Canned sardine exports for the first six months of 1956 reached 22.7 million pounds, a gain of 2.4 million pounds over the similar period of 1955.

Fish oil exports January through June 1956 of 63.1 million pounds were much greater than the 46.0 million pounds in the like period of 1955.



Wholesale Prices, August 1956

Landings of fish and shellfish in August 1956 were at about the same level as the previous month, but demand was only light to moderate in spite of the cool weather which prevailed in most marketing areas. Higher wholesale prices during the month for fresh dressed finfish were offset by lower prices for fresh and frozen processed and canned fishery products. The August 1956 over-all wholesale index (114.6

percent of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) was the same as the previous month, but 2.6 percent higher than in the same month in 1955.



General view of one of the sheds in Fulton Fish Market, New York City on a Friday morning after most of the selling activity is over. Barrels in foreground are ready for loading and shipping out.

Fresh fish landings, which were light in July, continued light in August in most fishing areas. All drawn, dressed, or whole finfish items included in the index were priced substantially higher in August 1956 than in the previous month, particularly (1) fresh large drawn haddock because of lighter landings, (2) fresh dressed halibut because of

evenly-distributed landings on the West Coast and a good demand, and (3) fresh king salmon because catches were light in the Pacific Northwest. Compared with the same month (hurricanes on East Coast) in 1955, wholesale prices this August for fresh drawn haddock were 39.5 percent lower at Boston and for whitefish were substantially lower at New York City and Chicago; but higher prices prevailed for fresh

halibut, fresh king salmon, and yellow pike at New York City, and lake trout at Chicago. The drawn, dressed, or whole finfish subgroup index in August 1956 was up 7.1 percent from the previous month, but down 4.0 percent from August 1955.

More plentiful supplies of small haddock were responsible for the drop in prices from July to August 1956 for fresh haddock fillets at Boston (down 13.6 percent) and fresh large shrimp at New York City (down 12.9 percent). Compared with August 1955, lower prices this August for fresh haddock fillets were more than

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)			
			Aug. 1956	July 1956	Aug. 1956	July 1956	June 1956	Aug. 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					114.6	114.6	109.7	111.7
Fresh & Frozen Fishery Products:					126.5	125.9	117.5	119.7
Drawn, Dressed, or Whole Finfish:					131.2	122.5	106.3	136.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.09	101.3	92.2	56.3	163.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.40	136.9	122.2	107.3	106.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.66	.64	148.3	142.7	144.4	135.4
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.49	.48	121.5	119.0	131.4	146.3
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.65	.65	131.4	131.4	139.5	171.8
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.60	.60	122.9	122.9	117.8	111.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.55	.54	129.0	126.7	78.6	119.6
Processed, Fresh (Fish & Shellfish):					122.2	128.6	127.7	107.3
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.29	.33	97.0	112.3	85.1	115.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.70	.80	110.2	126.4	129.3	98.0
Oysters, shucked, standards	Norfolk	gal.	5.75	5.50	142.3	136.1	136.1	117.5
Processed, Frozen (Fish & Shellfish):					114.5	117.7	112.1	99.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	103.4	102.1	102.1	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.28	.28	86.3	86.3	86.3	84.7
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.27	110.8	109.8	110.8	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.78	.82	120.4	126.6	116.1	94.1
Canned Fishery Products:					97.7	98.7	98.7	100.3
Salmon, pink, No.1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.60	10.60	76.4	76.4	76.4	92.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.50	7.50	87.5	87.5	87.5	88.1
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	cs.	7.50	8.20	79.8	87.3	87.3	79.3

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

offset by higher prices for fresh shrimp and shucked oysters. The index in August 1956 for the fresh processed fish and shellfish subgroup was 5.0 percent below the previous month, but 13.9 percent higher than in the same month of 1955.

Moderate stocks and a steady demand stabilized frozen fillet prices in August 1956 at almost the same level as the previous month, but they were somewhat higher than in the same month a year earlier. On the other hand, an increase in the supply of frozen shrimp and a slight drop in demand caused shrimp prices to drop from July to August this year. However, frozen shrimp prices at Chicago were still 27.9 percent above August 1955. The frozen processed fish and shellfish subgroup index for August 1956 was down 2.7 percent from the previous month, but rose 15.3 percent above the same month a year ago.

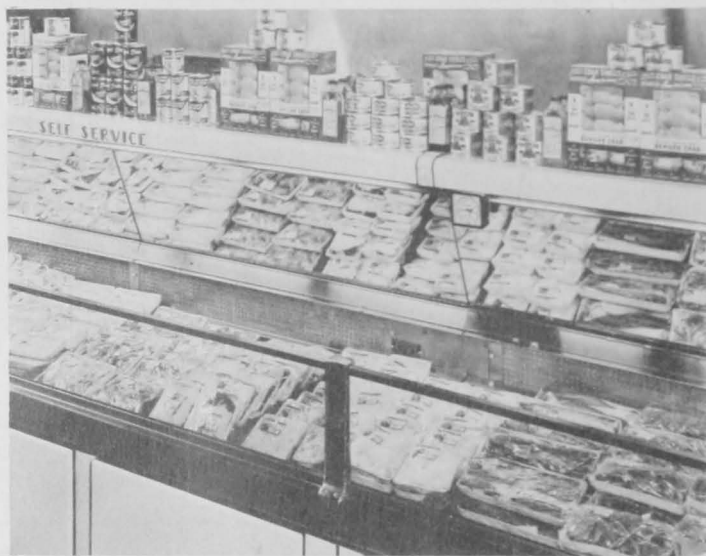
The only significant change in canned fishery products prices occurred in canned Maine sardines which dropped 8.6 percent from July to August with the entry of the new pack into the market. As of the end of August, the pack of Maine sardines was almost 50 percent greater than the pack a year ago when conditions were far below normal. With the salmon pack this season substantially better than last season, prices were strengthening although the index did not record a rise in mid-August. Compared with the same month in 1955, prices this August were 9.5 percent higher for canned pink salmon and 0.6 percent higher for canned Maine sardines, but 17.2 percent lower for canned light-meat chunk tuna and 0.7 percent lower for California tomato-packed sardines. The August 1956 subgroup index for canned fishery products was 1.0 percent lower than the previous month and 2.6 percent below the same month a year ago.



BOOM IN PREPARED FROZEN FOODS

Prepared frozen foods now constitute more than a third of all frozen foods marketed in the United States, after a remarkable increase of nearly 50 percent last year. Manufacturers of these convenience foods look for a further substantial increase this year--perhaps 35 percent over the 1955 total.

Agricultural products have gained most in this relatively new field of merchandising, but the fishing industry has also chalked up an impressive record.



Fish sticks sprang into national prominence two years ago following in the path of breaded shrimp. Other prepared fish specialty items soon appeared in grocers' display cases.

Housewives welcome the freedom from unpleasant odors and waste and the certainty of well-prepared meals without suffering the drudgery of a hot kitchen. So they are buying more and more of the many fine items of prepared frozen foods.

What is behind all this revolutionary change in marketing? The answer is advertising and promotion. Tempting color spreads in magazines arrest the attention and make fishery products ever so inviting, even to youngsters. Users of TV, radio, and newspaper advertising continually keep their products' merits before the consumers.

Those who pack these new prepared frozen food specialties have assumed a heavy responsibility to the consuming public. Most packers show a keen sense of awareness to the need for adherence to highest quality levels to insure repeat business. Government-sponsored voluntary standards of quality for fish sticks, which recently became effective, promise to exert a strong stabilizing influence in the sales of this product.