

TRENDS AND DEVELOPMENTS

Alaska

GAME LAW REVISION INCLUDES PROTECTION OF WALRUS ON HIGH SEAS: The polar bear and the walrus, which until recently have been living in comparative safety on the edges of the Arctic ice pack, will have protection on the high seas should the Congress accept the revisions of the Alaska Game Law recommended by Secretary of the Interior Fred A. Seaton. The Department, through authority already granted by the Congress (S. 4115), can control the taking of these animals in Alaska and in the adjacent Territorial waters.

A new hunting technique has been developed--spotting polar bears afloat on ice floes from airplanes and then following up with a motor boat and rifle to effect the kill. This has been taking an increasing toll of the bear on the high seas where authority to regulate such hunting is entirely lacking.

Modern transportation, modern guns, and a market for polar bear skins and walrus ivory are taking both of these animals out of their historic role of subsistence items for the Eskimo and in many instances are making them articles of commerce.

Because of the seriousness of the situation, Secretary Seaton has already asked that more biological data be acquired and better population estimates of these animals be made to assure keeping the harvest within limits.

The Secretary is also asking that more authority be given to the Alaska Game Commission.

Many of the provisions of the bill to revise the Alaska Game Law were worked out jointly by the Alaska Game Commission and the Department. The new legislation would cover game and fur mammals, game and nongame birds, and game fishes.

At the present time the responsibility for prescribing regulations governing the harvest, management, and protection of Alaska's fish and wildlife resources rests with the Secretary of the Interior, with the Alaska Game Commission acting in an advisory capacity. Under Secretary Seaton's proposal the responsibility for prescribing such regulations would rest with the Alaska Game Commission, with the approval of the regulations by the Secretary. This proposal to place the entire rule-making function with the Commission is in keeping with the practice followed by most States.

The future of the polar bear and the walrus is of primary concern. There is no existing law under which the Department of Interior or the Terri-

tory of Alaska can restrict the taking of polar bears and walrus on the high seas. Unrestricted hunting of these animals on the high seas has increased at an alarming rate in recent years. The proposed amendments, applicable to American nationals, would provide for protection of these animals on the high seas subject to the provisions of existing law which allows natives to take walrus for subsistence purposes.

Other changes would eliminate many inflexible provisions from present legislation and permit the Commission to adopt or change management practices to meet changing situations. The Commis-



Walrus

sion would also have the right to prescribe regulations, subject to approval by the Secretary, on reasonable fees for licenses, tags, or permits.

The existing authority of the Commission requiring nonresidents to employ guides would be changed to permit the adoption of regulations, in the interest of public safety, to require that all persons hire guides when engaged in hunting or photographing specified species of game or marine animals in specified areas. The Commission would also be given more authority in regard to the qualifications of guides and the conduct of guiding activities. Provision is also made for mandatory revocation of a guide license for a period of from one to five years when a guide is found guilty of violation of the game law or the regulations.

When Alaska becomes a state, responsibility for prescribing and enforcing regulations applicable to the taking of marine mammals on the high seas by persons subject to the jurisdiction of the United States will remain with the Secretary of the Interior.

WILDLIFE REFUGE CREATED TO PROTECT SEA OTTER: Creation of the Simeonof National Wildlife Refuge in Alaska for the preservation and propagation of the sea otter was announced today by Secretary of the Interior Fred A. Seaton.

The new refuge contains approximately 10,442 acres. It includes all of Simeonof Island and the island's tidelands together with all adjacent water areas extending one mile beyond mean low water. Simeonof, one of the Shumagin group off the south-

easterly coast of the Alaska Peninsula, is approximately 250 miles southwest of Kodiak Island.

Sea Otter



Assistant Secretary of the Interior Ross Leffler said Simeonof Island's luxuriant kelp growth provides an ideal habitat for the otters. The population of the herd is estimated at approximately 500. Otter herds live on other islands.

The species is slowly increasing because it has received vigilant protection since the Alaska Game Commission discovered a few otters surviving in an Aleutian bay, Assistant Secretary Leffler said.

Man is the otter's only serious enemy. From time immemorial Eskimos and Aleuts had hunted otters, but in moderation and with little harm to the vast herds. But in 1741 a shipwrecked crew of sailors returned to Russia with 700 sea otter furs and a ruthless hunt began for the silky, valuable fur. Aleuts were hired to spear the prey. Scores of otter ships put out from ports as distant as Boston and Mexico. So tremendous was the slaughter that by 1840 sea otters were at the brink of extinction.

Simeonof Island is well adapted to livestock production. The order creating the wildlife refuge permits grazing to continue, but only one grazing permit will be permitted at any one time. Violation of game regulations or undue interference with the otter herd by the grazing lessee, his agents or employees, will constitute valid reason for cancellation of the lease.

Establishment of the refuge will also give increased protection to other wildlife in the area, including tufted and horned puffins, glaucous-winged gulls, murrelets, cormorants, fulmars, kittiwakes, insectivorous birds, eider and harlequin ducks, arctic terns, and sea lions.



California

ANCHOVY CONCENTRATION REPORTED OFF COAST: An apparent "explosion" in the anchovy population off the California coast from Pt. Arena to Pt. Conception was reported the week of June 15, 1958, by the California Department of Fish and Game.

The Department said the population is made up of anchovies from last year's spawning and some from this year's, and is the greatest since 1952. The anchovies are too small to be of commercially-catchable size, but they are already food at least for salmon. The Department said good salmon catches are being made adjacent to anchovy schools.

The abundance of anchovies follows five consecutive lean years in which very few anchovies were found north of Pt. Conception. This year massive schools were spotted throughout the central California area. Largest numbers, noted by the Department's aerial spotting runs and checks with fishermen, were located off Pt. Reyes where some 5,000 schools were seen. The Department estimates the size of the population to average about 20 tons a school. Some 300 to 400 schools were spotted near San Francisco off Fleischacker's and an equally large number in Morro Bay.

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COMMERCIAL FISHERIES LANDINGS DECLINE IN 1957: Commercial landings and shipments of fish and shellfish into California totaled 737.8 million pounds in 1957, a drop of about 35 million pounds as compared with the 1956 total of 771.7 million pounds. During 1955, 710.2 million pounds were landed or shipped into the State, according to figures released by the California Department of Fish and Game. The record was set in 1936 at 1.7 billion pounds, most of it sardines (1.5 billion pounds). A drop of 23.7 million pounds in the sardine catch and 13.7 million pounds in tuna landings were major contributors to the decline in 1957. A major decline of 6 million pounds of salmon from the 1956 figure was offset by an increase of 5 million pounds of crabs and oysters and slight increases in other catches.

In terms of landed weight, the Eureka region climbed from 5th to 4th place, moving ahead of the Monterey region. Other port regions held the same position in 1957 as the previous year.

Los Angeles was the leading port with 334.5 million pounds of fish landed. Other regions, by pounds landed, were: San Diego, 121.2 million; Santa Barbara, 73.1 million; Eureka, 47.6 million; Monterey, 27.1 million; San Francisco, 22.4 million; and Sacramento, 1.3 million pounds.

Total landings and shipments consisted of 627.2 million pounds landed by the California fishing fleet and 110.6 million pounds brought into the State by common carrier and not caught by the California fishing fleet.

Of the fish landed by the fishing fleet, more than half were caught in California waters. Landings from waters north of the state boundary accounted for 1.5 million pounds. Landings of fish caught below the international boundary amounted to 259.5 million pounds. Most of this catch was (257.7 million pounds) made up of five species of tuna.

In weight, yellowfin tuna was the leading species caught in 1957 by California's commercial fishermen, who landed 136.9 million pounds of this species in 1957. Jack mackerel led the list of landings from California waters with 82.0 million pounds.

Other leading commercial species, in pounds, landed from California waters in 1957 were: Pacific mackerel, 62.0 million; sardines, 45.8 million; anchovies, 40.5 million; albacore, 22.6 million; crab, 19.0 million; rockfish, 15.7 million; squid, 12.4 million; giant Pacific oyster, 11.1 million; bluefin tuna, 10.5 million; Dover sole, 6.9 million; salmon, 5.6 million; and abalone, 5.4 million. Individual catches of other species were less than 5 million pounds in each case.

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KELP STUDY: Even underwater plant life, such as kelp, can be "sunburned." Perhaps kelp in the future can be grown in special large tanks, then transplanted while still young to now-barren oceanic areas.

Fascinating facts and possibilities such as these are beginning to emerge from a five-year study being conducted under contract for the California Department of Fish and Game by scientists of the Scripps Institution of Oceanography at La Jolla. They've thrown quite a task force into getting the facts on the giant kelp of the California coast, known scientifically as *Macrocystis*.

They have a rather large order confronting them, for there's been a long-standing controversy over whether commercial kelp cutting on a regular harvest basis does any damage to the extensive sport fishery which itself has become big business in Southern California.

It's well known, of course, that fishes and other forms of marine life take a fancy to kelp beds as a good place to find food and shelter. It's also a fact that kelp is a valuable product as fertilizer, as a food additive, for its chemicals, and in many other important ways too numerous to list.

Although there have been previous limited studies on the same subject, none was thorough enough or objective enough to satisfy the avid anglers who see in kelp cutting a threat to their favorite sport.

Helping to shape and guide the kelp research program is a committee representing a broad variety of interests and groups. Plans call for the Institution's scientific team to report regularly on progress being made to the committee, which will be responsible for informing the public and the Legislature as to results being obtained.

The program now is in its second year. Early stages of the study are devoted mainly to gathering basic information about kelp and its environment.

Four main lines of research are being pursued. These include the relationship between kelp and fish life, plant physiology, the reproductive cycle and growth rates, and environmental conditions. As many as 10 men--staff members, graduate students, and other specialists--are engaged in various phases of the study.

Most of the kelp scientists spend much of their time underwater, using self-contained underwater breathing apparatus (SCUBA) to attack the problem at close range. The work also entails cruises to sections of Southern and Baja California coastal waters to study kelp beds untouched by man so that information may be obtained for comparison with the harvested beds.

One of the interesting things being discovered about the complex and little known life of the kelp plant is that it can be successfully made to reproduce in the laboratory. This leads to the cautious hope that eventually it can be grown in quantity in special tanks ashore, then transplanted to oceanic areas now lacking in desirable plant life--which, in turn, probably would attract more fishes and thus provide better fishing in readily accessible spots along the coast.

It has been found also that kelp can be seriously damaged by "sunburn" and that the plant's ability to grow is restricted by too large doses of light and too high water temperatures. Near the ocean bottom where light is dimmer and temperatures cooler, kelp seems to grow better, which helps to explain why the heaviest beds often are located in colder water.

Effects of almost daily cutting on thickness of a kelp bed are being studied at Paradise Cove near Malibu. Here a pier, popular with fishermen, is located behind a large kelp bed. The comings and goings of many small craft keep a channel open through the bed, since the propellers continually chop off the tops of the plants.

The studies reveal that the kelp bed thickness below the surface in such constantly cut areas is only one-half to one-third as great as in the surrounding uncut areas. As might be expected, there are far fewer adult stems than usual but many more young plants in continuously cut areas.

On the other hand, comparisons between thicknesses of kelp in commercially-harvested beds (usually two to four times a year) and unharvested beds reveal no consistent differences so far.

Of great interest to the kelp investigators is the result of a shipwreck last year on a rocky point in Baja California. A loaded tanker went aground there and the resulting oil spill killed many marine organisms which graze on kelp, yet the oil did not do much damage to the kelp itself. This has given the scientists a unique opportunity to study a bed free from most of the natural depredation.

In addition to these studies being pursued at La Jolla, personnel of the Department of Fish and Game have photographed the entire Southern California and Channel Island coastline from the air and are preparing charts showing where the kelp beds are located. Another department worker is reviewing the history of kelp harvesting to tie in with other phases of the over-all study.

The Institution's researchers emphasize, however, that kelp beds vary from place to place and season to season, and the plant itself is a complex organism, so that it won't be easy to draw any firm conclusions. (*Outdoor California*, June 1958, of the California Department of Fish and Game.)

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SPAWNING SARDINE BEHAVIOR OBSERVED BY AERIAL SCOUTING (Airplane Spotting Flight 58-2A): Coastal waters from Point Arguello south to the U. S.-Mexican boundary and offshore around the Northern Channel Islands, Santa Catalina Island, Los Coronados Islands were scouted from the air on March 18-19 to observe the behavior of spawning sardines. The scouting was conducted by the California Department of Fish and Game with their Beechcraft plane.

In general, atmospheric conditions suitable for aerial observing were fair to good, with morning fog and smog the major deterrents. The Los Angeles basin was particularly bad, affecting adjacent areas as far offshore as Santa Catalina Island, south to Dana Point, and northwestward to Santa Barbara. Figures 1 and 2 depict the areas covered by the survey and the locations of sightings of the various animal species.

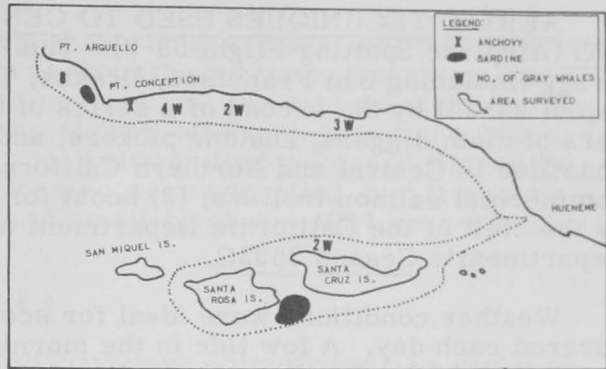


Fig. 1 - Airplane Spotting Flight 58-2A.

Three of the 13 groups of fish schools sighted were identified as sardines and five as anchovies, while four were composed of large fish, probably yellowtail. One group was too deep for identification but appeared to be either sardines or jack mackerel.

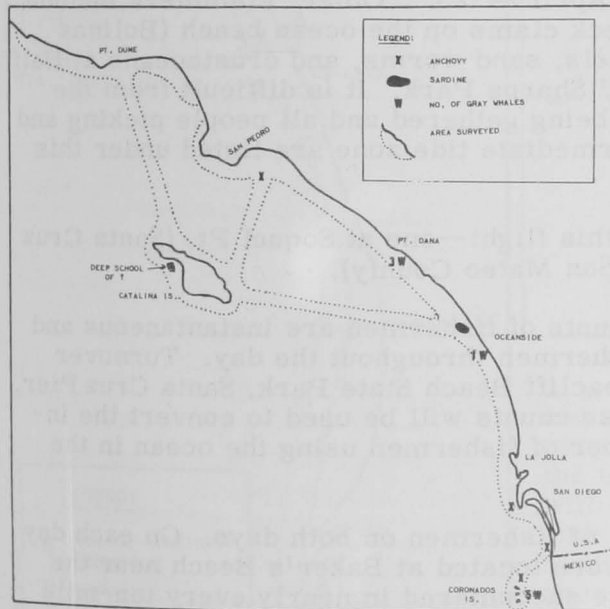


Fig. 2 - Airplane Spotting Flight 58-2A

Small groups of California gray whales, 25 in all, were sighted throughout the surveyed area; several were young of the year and all were moving northward.

Scattered groups of porpoise and seals were also seen; however, positive identifications were not made.

The sighting of sardine schools about the Channel Islands was of particular interest because the presence of sardine eggs in plankton tows, made from the research vessel *N. B. Scofield* just previous to the flight, indicated that sardines were actively spawning in the area. It would appear that during spawning the fish school near the surface of the water for a portion of the day. This behavior does not differ significantly from that observed at other times of the year.

The sardine school groups were relatively small and distinct but widely separated. A school group sighted close to shore just north of Point Conception was composed of 4 to 6 small schools. The largest group observed was estimated to contain 15 to 20 schools. These were seen in the channel between Santa Rosa and Santa Cruz Islands. Four schools in the area off Oceanside were all relatively small.

The anchovy schools and school groups were also very small with not more than two schools per group. Three of the five groups were found in the San Diego

area while the other two were at widely separated localities: Horseshoe Kelp south of Point Firmin and south of Point Conception.

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AERIAL TECHNIQUES USED TO CENSUS COMMERCIAL AND SPORT FISHING (Airplane Spotting Flight 58-3): The inshore area between Monterey and Fort Bragg (including San Francisco, Drakes, Tomales and Bodega Bays) was surveyed (April 24-25) by the second of a series of flights designed to: (1) assess the numbers of clam diggers, abalone pickers, and hook-and-line fishermen utilizing the coastline in Central and Northern California; (2) record the number and location of commercial salmon trollers; (3) scout for pelagic fish schools. The flight was made by the staff of the California Department of Fish and Game on April 24-25 in that Department's Cessna 3632C.

Weather conditions were ideal for scouting and the entire area surveyed was covered each day. A low tide in the morning attracted Pismo clammers to the beaches and bay clammers to the lagoons, but the tide was not low enough to attract many abalone pickers. The tide was -0.3 feet on the 24th and -0.2 feet on the 25th. Northwest winds up to 14 knots developed in mid-afternoon on each day.

Clamming Census: Compared to the large numbers of clammers (909 tallied on Sunday, March 2, 1958), relatively few clammers (182) were tallied over the same section of the coast on this flight on April 24-25. "Other" clammers include all persons digging for cockles and littleneck clams on the ocean beach (Bollinas Bay) and for fish bait which includes mussels, sand worms, and crustaceans at Half Moon Bay, Scott Creek, Pescadero Pt., and Sharps Park. It is difficult from the air to determine exactly what species are being gathered and all people picking and digging in and around the rocks in the intermediate tide zone are listed under this "other" category.

Two abalone pickers were sighted on this flight--one at Soquel Pt. (Santa Cruz County), and the other off Waddell Creek (San Mateo County).

Hook-and-Line Fishermen: Aerial counts of fishermen are instantaneous and do not take into account the turnover of fishermen throughout the day. Turnover counts were made at the Cement Ship at Seacliff Beach State Park, Santa Cruz Pier, Baker's Beach, and Berkeley Pier and these counts will be used to convert the instantaneous aerial tally into the total number of fishermen using the ocean in the area surveyed on these two days.

There was a very similar distribution of fishermen on both days. On each day nearly a third of all the shore fishermen were located at Baker's Beach near the Golden Gate Bridge. Shore fishermen were encountered in nearly every ten-mile section of the coast but were not present in any great numbers except at Baker's Beach. A tally in each ten-mile section surveyed from Monterey to Bodega Bay revealed that on both days there were 188 surf fishermen and 55 rock fishermen.

Counts of pier fishermen were made early in the morning in the Monterey Bay area and the numbers of fishermen cannot be compared directly to the numbers tallied on the piers in the San Francisco Bay region which were made later in the day. The peak of abundance of anglers on piers occurs sometime between 10 a. m. and 2 p. m. so direct counts of pier fishermen cannot be compared. Again turnover curves are necessary to convert instantaneous counts into totals which can be compared.

Commercial Salmon Trollers: Commercial salmon fishing has been poor so far this season and consequently only a relatively small number of trollers were

sighted. On the 24th a total of 28 commercial salmon trollers were sighted; 9 off Monterey, 8 in the area between San Francisco and Bodega, and 12 off Fort Bragg. On the 25th a total of 34 were sighted; 20 in Monterey Bay and 14 in the San Francisco to Bodega area. The area to the north of Bodega Bay was not covered on the 25th.

Pelagic Fish: Anchovies are beginning to appear at the surface, thus repeating the seasonal behavior of "disappearing" throughout the winter and early spring months and reappearing sometime in April or June. All the schools sighted were very small surface schools. One school was sighted off Pt. Reyes on the 24th and about a dozen schools were sighted in the area between Pedro Pt. and Pigeon Pt. on the 25th. Fishermen working out of Princeton were contacted, and it was disclosed that these small schools were made of small (probably 1957 year-class) anchovies.

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SARDINE DISTRIBUTION AND ABUNDANCE OFF SOUTHERN CALIFORNIA SURVEYED FROM AIR (Airplane Spotting Flight 58-2B): To determine the coastal distribution and approximate abundance of sardines and other pelagic fishes off the

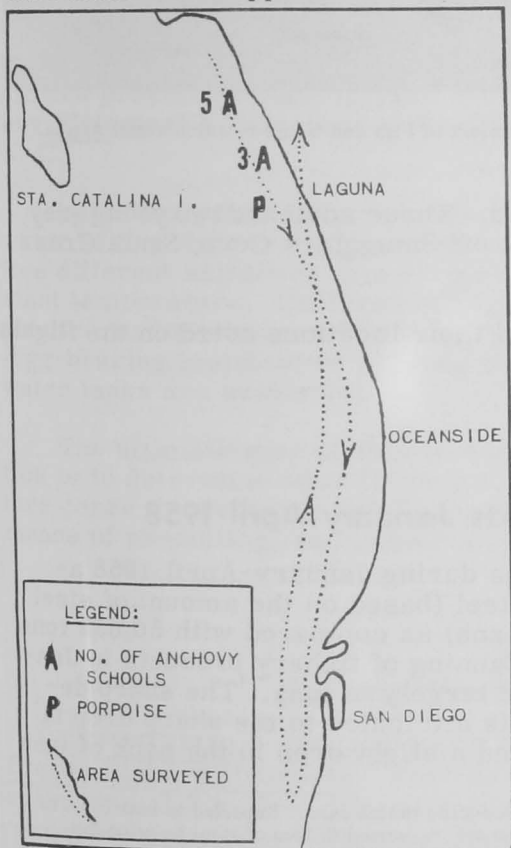


Fig. 1 - Flight (58-2B) of April 17, 1958.

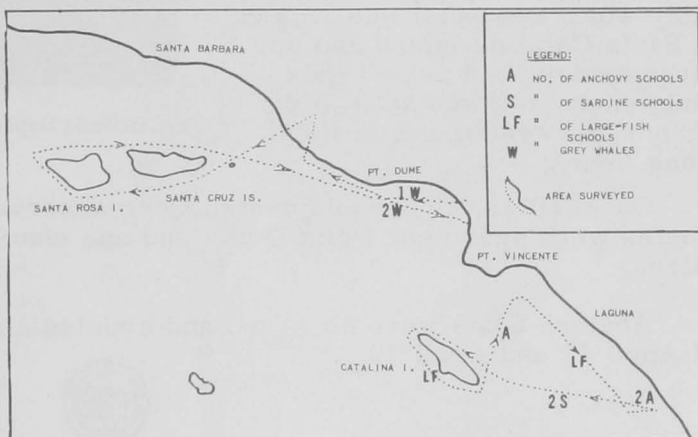


Fig. 2 - Flight (58-2B) of April 18-19, 1958.

coast of southern California was the principal purpose of an airplane spotting flight made by the California Department of Fish and Game with their Beechcraft plane April 17-19. A secondary objective was to locate and count abalone boats working in the area surveyed. The inshore area from the beach to four miles offshore from Long Beach to the U. S.-Mexican Border was surveyed on April 17. The area 8 to 10 miles offshore from Laguna Beach to Oceanside, from Oceanside to Santa Catalina Island and the area around Santa Catalina Island was surveyed on April 18. The inshore area

from Malibu to Point Mugu and the area around the islands of Santa Cruz and Santa Rosa was surveyed on April 19.

Fog and overcast hampered work during the first two days, April 17 and 18, and permitted only limited flying with poor visibility.

On April 17, 5 schools of anchovies were observed off Huntington Beach and 3 schools of anchovies were seen in the area around the Newport sewer outfall. A small school of porpoise was noted 1 mile SE. of the Newport beach jetty. Water conditions near shore were muddy but green to dark blue farther offshore.

On April 18, the offshore area was scouted to determine if scattered fish and numerous small spots of sardines, observed from the Department of Fish and Game research vessel Alaska, would be visible from the air. In general, they were not--only 2 small schools of anchovies were seen in the area which had been scouted by the vessel. However, 2 schools of anchovies were observed near shore off Oceanside, and, in addition, one school of large fish was seen 8-10 miles off Laguna Beach. The live bait operator at Oceanside had reported many schools of anchovies and sardines in 120 feet of water with the fish appearing at a depth of 90 feet; these fish were not observed from the air. A school of large fish (possibly white sea bass) was located at Santa Catalina Island and one large unidentified school (possibly anchovies) was seen in the channel between the island and Long Beach.



California Department of Fish and Game research vessel Alaska.

On April 19, no schools of fish were observed. Three adult and two young grey whales were seen near Point Dume and one shark off Smugglers Cove, Santa Cruz Island.

Abalone boats were observed and counted and their locations noted on the flights of April 17 and April 19.



Cans--Shipments for Fishery Products January-April 1958



Total shipments of metal cans during January-April 1958 amounted to 29,239 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 50,652 tons in the same period a year ago. Canning of fishery products in January-April this year was confined largely to tuna. The sharp decline in shipments of metal cans is attributed to the sharp drop in the canning of mackerel, anchovies, and shrimp and a slight drop in the pack of tuna due to lighter supplies of raw material.

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.



Container to Reduce Handling of Refrigerated Foods

A new perishable food container which its backers hope will substantially reduce the cost of transporting perishable foods is reported to be under development by a truck line, a railroad, and a supplier of railroad equipment, according to Quick Sheet (National Association of Refrigerated Warehouses).

The plan calls for the use of refrigerated containers of a size which could be handled from a piggy-back trailer directly into a supermarket's walk-in refrigerator without having to be handled during transit. Each container would have its own refrigerating unit so that the piggy-back trailer could accommodate mixed loads of commodities requiring different temperatures. Project engineers believe that use of such a container would reduce from six to one the number of handlings now required.



Crabs

INVESTIGATION OF BLUE-CRAB ABUNDANCE AND CATCH FLUCTUATIONS:

An investigation to determine the causes of fluctuations in the abundance and catch of blue crab in the Chesapeake Bay area has been initiated by the U. S. Bureau of Commercial Fisheries by awarding a contract to the Oyster Institute of North America to conduct the study. Financed by funds provided by the Saltonstall-Kennedy Act, the researchers hired by the Institute will utilize laboratory facilities provided by the Bureau's Fishery Biological Laboratory at Beaufort, N. C.



Blue Crab

Laboratory facilities provide sea water at five different temperatures or five different salinities at a single constant temperature. Cultures of marine plankton and a number of "sponge" crabs (egg-bearing females) in running sea-water tanks are available.

The ultimate goal of this investigation is to determine what factors in nature cause the rather large fluctuations in the year broods of crabs, and to find means of predicting, and possibly controlling, the fluctuations in abundance.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1958: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.1 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in May 1958 by the Military Subsistence Market Centers. This was lower than the quantity purchased in April by 8.0 percent and 22.0 percent less than the amount purchased in the same month a year ago. The value of the purchases this May was lower by 3.2 percent as compared with the previous month, and down 9.6 percent from May a year ago.

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

QUANTITY				VALUE			
May		Jan. - May		May		Jan. - May	
1958	1957	1958	1957	1958	1957	1958	1957
(1,000 Lbs.)				(\$1,000)			
2,054	2,635	9,310	10,002	1,152	1,274	5,294	5,106

Products were purchased in May 1958 by the Military Subsistence Market Centers. This was lower than the quantity purchased in April by 8.0 percent and 22.0 percent less than the amount purchased in the same month a year ago. The value of the purchases this May was lower by 3.2 percent as compared with the previous month, and down 9.6 percent from May a year ago.

For the first five months of 1958 purchases totaled 9.3 million pounds, valued at \$5.3 million--a decrease of 6.9 percent in quantity, but an increase of 3.7 percent in value as compared with the same period of 1957.

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

Species	QUANTITY		VALUE	
	May	Jan.-May	May	Jan.-May
	.. (1,000 Lbs.) (\$1,000) ..	
Tuna	315	1,270	158	640
Salmon . . .	-	1,372	-	724
Sardine . . .	-	33	-	12

48.3 cents paid during May a year ago.

Canned Fishery Products: Tuna was the only canned fishery product purchased for the use of the Armed Forces during May 1958. Prices paid for canned tuna increased from 44.2 cents a pound in May 1957 to 50.2 cents a pound in May 1958.

Note: The Armed Forces installations make some local purchases not included in the data given. Actual total purchases are higher than indicated, but it is not possible to obtain local purchases.



Films

FILMING TO START ON FIRST OF TWO SALMON FILMS: All commercial species of salmon, all methods of catching them, and the way in which they are canned will be portrayed in a film now being produced by the U. S. Fish and Wildlife Service.

The film is the first of two which the Bureau of Commercial Fisheries will produce in cooperation with the Canned Salmon Institute of the Association of Pacific Fisheries. A salmon recipe booklet in full color, which will be distributed with the films, is also under preparation. Both of the films and the recipe booklet are being completely financed by the Association of Pacific Fisheries. Production is under the direction of the technical film expert for the Bureau. The filming is to be done under contract by MPO Productions of New York City.



Sequences will be filmed of the 1958 salmon run in the Columbia River, Puget Sound, and in the Alaska fisheries. Other sequences will show activities in the processing plants with additional footage on cooking and serving.

In the second film the emphasis will be on purchasing, cooking, and serving with some sequences on catching and processing. Contract for this work will be awarded shortly.

Each film will run 14 minutes. Each will be 16 mm. in sound and color. The films, which will not be ready for distribution for several months, will be available free of charge through the Bureau's film distribution system. When the recipe booklet is available, which will be concurrent with the release of the films, copies may be secured through the Government Printing Office at a nominal cost.



Great Lakes Fishery Investigations

WESTERN LAKE ERIE SURVEY CONTINUED

(M/V Cisco Cruise 5): Trawling operations were conducted in 12 areas in western Lake Erie by the U. S. Bureau of Commercial Fisheries research vessel Cisco during Cruise 5 between June 17-30, 1958. Ten of these areas include stations scheduled for visits every cruise. As during previous cruises, this year yellow perch and smelt made up the bulk of most of the catches. Smelt, except for fry, were not common in catches in extreme western Lake Erie, suggesting the beginning of a general easterly movement of the species. Sheepshead, emerald shiners, spottail shiners, and trout-perch were the only other species regularly caught in large numbers. About 2,700 emerald shiners were taken in one 10-minute tow, but the catch of this species was usually much smaller. Many of the mature sheepshead appeared ripe, but none had spawned. Trout-perch have begun spawning and emerald shiners and spottail shiners are nearing that stage. Other species taken include walleye or yellow pike (very few), silver chub, white sucker, carp, white bass, channel catfish, burbot, white crappie, smallmouth bass, and gizzard shad. The latter species, as well as the alewife, continues to be rare in the catches.

An experimental nylon gill net (mesh sizes 1-, 1½-, 2-, 2½-, 3-, and 4-inch) was set in 4 fathoms off Sandusky. The net was "canned up" so that its float line was 6 feet below the surface. The catch was almost entirely 2-year-old yellow perch except for several smelt which were taken in the smallest mesh.

The examination of large numbers of stomachs of several species of fish taken from Lake Erie

Note: See Commercial Fisheries Review, July 1958, for scientific names of species mentioned in this article.

this year has begun and is progressing satisfactorily. The analyses are being made by the Ohio State University at its Stone Laboratory at Put-in-Bay, Ohio.

In an attempt to gain information regarding vertical movements of fish, gill nets were set obliquely from top to bottom for two-hour periods from mid-afternoon until midnight. Practically no fish were caught until the last set, indicating that there was little movement into midlevels until well after dark.

Fish fry were collected with large-mesh plankton nets which were either towed alongside the boat or attached to the headropes of the trawls, and by use of a "sled" trawl fitted with a bobbinet liner in its cod end and designed to operate on rough bottom. Some of the very small fry are as yet unidentified, but the larger were mostly smelt and yellow perch. Some unidentified pelagic eggs were also taken. Considerable difficulty was encountered with the plankton nets becoming heavily laden with zooplankton, principally Daphnia retrocurva. In spite of the great abundance of crustacean plankton, the water in western Lake Erie was comparatively clear, apparently due to a general scarcity of phytoplankton, especially filamentous diatoms.

Owing to the cool weather which prevailed, water temperatures during Cruise 5 did not increase as much as would be expected at this time of the year. Surface temperatures in the western basin ranged mostly from 18.5° C. (64.3° F.) to 20.0° C. (68.0° F.) but temperatures as low as 16.6° C. (61.8° F.) were recorded off Lorain, Ohio, in the central basin. Thermal stratification was observed in the central basin with the metalimnion just off the bottom in 10 fathoms of water.



Gulf Exploratory Fishery Program

EXPLORATORY AND COMMERCIAL-SCALE FISHING FOR ROYAL-RED

SHRIMP OFF FLORIDA EAST COAST (M/V Silver Bay Cruise 9): During June 1958, the U. S. Bureau of Commercial Fisheries chartered fishing vessel M/V Silver Bay made a shrimp trawling survey off the east coast of Florida. The cruise was divided into two parts: exploratory fishing and royal-red shrimp (Hymenopenaeus robustus) fishing on a commercial scale. The exploratory trawling included 24 drags in depth varying from 25-590 fathoms, 13 of the 24 drags were made in depths greater than 300 fathoms. Although the data gained from this phase of the cruise greatly supplemented existing knowledge of offshore conditions, no significant concentrations of commercially-valuable species were found.

The second phase of the cruise was devoted primarily to simulated production-type fishing for royal-red shrimp. Utilizing a full week of around-the-clock fishing effort, 34 drags were made.

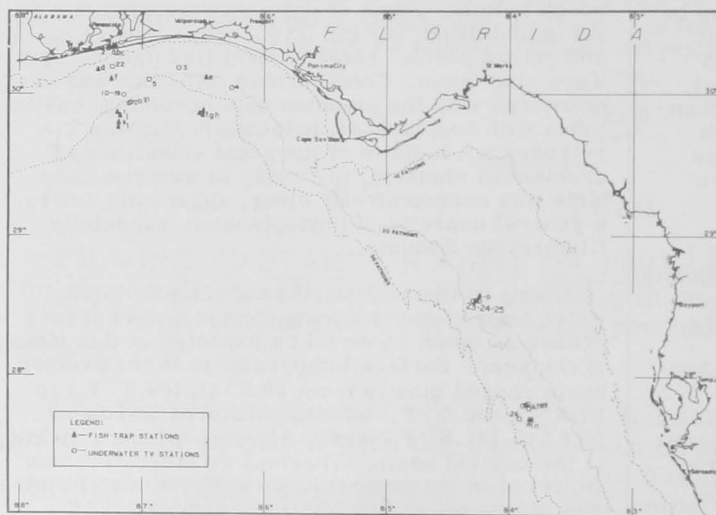
Two types of gear were employed during this part of the cruise; a 65-foot balloon net fished on a bridle with a single warp, and an 85-foot balloon trawl fished with two warps. Bracket-type doors were used with both rigs; 5½-foot doors in combination with the 65 foot net, and 8 foot doors with the 85-foot balloon trawl. Twelve successful tows, with the 65-foot trawl, yielded about 195 pounds of royal-red shrimp (heads-on) per 3-hour drag, 8 drags with the 85-foot balloon trawl averaged 225 pounds of red shrimp per 3-hour tow. Best fishing was found in depths

between 180-200 fathoms off St. Augustine, Fla. After 7 days of operation, 2,143 pounds (heads-off) of 20-30 count royal-red shrimp were caught. Current fluctuations and resulting gear fouling caused considerable loss of fishing time during the 7-day period.

Of special interest was the capture of a giant squid on June 11. The damaged specimen, which was estimated to be 43 feet in length, was found floating on the surface of the Gulf Stream off Cape Canaveral. It has been turned over to the Marine Laboratory, University of Miami, for study.

* * * * *

PRELIMINARY EXPERIMENTS TO CATCH RED SNAPPERS WITH BOTTOM TRAPS UNSUCCESSFUL (M/V George M. Bowers Cruise 12): Only 50 pounds of red snappers were caught in 87 trap sets (2 hours to 8 days duration) made in the upper Gulf of Mexico offshore from Mobile, Ala., and Tampa, Fla., by the U. S.



M/V George M. Bowers Cruise 12 (Jan. 14-June 6, 1958)

Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. Tests between January 6 and June 6, 1958, were conducted to determine the feasibility of using traps for the commercial capture of red snappers. Most of the effort was concentrated in the Pensacola area.

Fish traps of several designs, principally arrowhead, "L" shaped, and rectangular, were used during the cruise. Red snapper were caught in 8 of the 87 sets. The largest catch of red snappers was made during a two-hour set when 8 snappers ($1\frac{1}{4}$ - $2\frac{1}{4}$ pounds) were caught. The traps also caught

groupers and scrap fish but not in commercial quantities. The largest catch by hand lines made at any location was about 1,700 pounds of red snappers and 600 pounds of groupers during a two-day period.

In addition, an underwater television unit was mounted on fish traps of various designs, and 25 tests of this gear were made. The time of these sets ranged from 5 minutes to over 14 hours. Observations of the TV monitor screen were made and 3,400 feet of film was taken off the screen. This film shows snappers, groupers, triggerfish, and other species around, entering, and some leaving the traps. The observations of the reactions of fish to the traps indicated that modification of the trap entrance tunnel might be desirable. After modifications were made, fish entered the trap more readily. The largest catch, however, during this series of 25 sets was about 55 pounds of groupers and 10 pounds of red snapper during one 30-minute set of a modified trap.

During the January-March period, operations were greatly hampered because of weather conditions in the upper Gulf. Time was also lost from this cruise during April when the vessel was in drydock.

Films of the TV screen made in this period are presently being studied and edited for future showing.



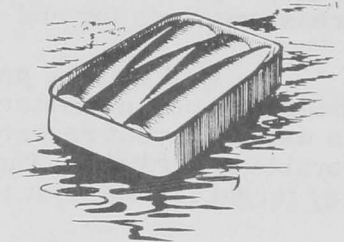
Lobsters

CANNED CATFOOD USED AS SPINY LOBSTER BAIT: In Key West, Fla., spiny lobster fishermen have turned from the fish heads and noncommercial or trash fish normally used for bait in lobster pots to canned cat food (made with a fish base). Two holes are punched in an 8-oz. can which is wired into the pot. The canned bait is as effective as the previously used waste fish and lasts, even in warm tropical waters, up to a week. It has the additional advantage that, unlike the customary bait, the trapped spiny lobster cannot consume it.



Maine Sardines

SEASON OFF TO SLOW START: The Maine sardine canning season was off to a slow start with production as of the week ending June 6 only about 1 percent of the total for the same date last year. Several plants working sporadically had packed a total of about 3,000 cases as compared with 271,000 cases of canned Maine sardines in the same period of 1957, a June 11 news release from the Maine Sardine Council points out.



About 33 plants were ready to operate, but the fish supply had been so limited that it was impossible to start full-scale production on an efficient basis. The industry expected increased operations would begin soon since conditions seemed to be ideal for the usual June run of fish.

The 3,000 cases processed was the smallest pack as of the first week in June for 20 years and minute in comparison with 1954 when the industry had produced 501,000 cases. Packs for similar periods in other years were as follows: 1951--87,000; 1952--297,000; 1953--207,000; 1955--44,000; and 1956--95,000 cases.

The industry is again faced with higher operating costs, for the sixth year in a row, due to increases in the price of cans and other items.

* * * * *

CANNED STOCKS JUNE 1, 1958: Distributors' stocks of Maine sardines totaled 237,000 actual cases on June 1, 1958--7,000 cases or 3 percent more than the 230,000 cases on hand June 1, 1957. Stocks held by distributors on April 1, 1958, amounted to 293,000 cases, and on January 1, 1958 totaled 230,000 cases, according to estimates made by the U. S. Bureau of the Census.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Cannery Stocks, June 1, 1958, with Comparisons

Type	Unit	1957/58 Season				1956/57 Season			
		6/1/58	4/1/58	1/1/58	11/1/57	7/1/57	6/1/67	4/1/57	1/1/57
Distributors	1,000 Actual Cases	237	293	230	298	212	230	295	347
Cannery	1,000 Std. Cases 1/	235	476	1,111	1,337	895	416	465	879

1/ 100 3³/₄-oz. cans equal one standard case.

Cannery stocks on June 1, 1958, totaled 235,000 standard cases (100 3³/₄-oz. cans), a decrease of 181,000 cases (44 percent) as compared with June 1, 1957, and a decrease of 78.2 percent (876,000 cases) from the 1,111,000 cases on hand January 1, 1958. The total supply for the 1957 season (April 15-December 1) was close to 2,543,000 standard cases. This amount includes a pack of 2,117,000 cases plus

a carryover of 426,000 from the 1956 season. The pack of Maine sardines from April 15, 1958 to June 1, 1958 was only 1,500 cases.

The packing season opened on April 15, 1958, but the pack was very light during the first two months of the season. Catches improved early in June and as a result the canners' stocks began to improve, but the pack was still only half of that in 1957. As of June 28, only 302,000 standard cases had been packed this season as compared to 672,000 cases as of the same date last year. While there was a good run of fish in the area west of Boothbay Harbor, many were too large for canning purposes.

* * * * *

SARDINE INDUSTRY INCREASES ADVERTISING EXPENDITURES: Accelerating its promotional activities, the Maine Sardine Council will spend \$50,000 for publicity and public relations during the fiscal year starting July 1, 1958. The Council's Executive Secretary said on June 25, that the budget for these items had been nearly doubled from the previous year and was in line with the Council's efforts to increase markets for and consumption of Maine sardines.



He said that the promotional activities would feature the industry's new mandatory grading and quality-control programs as well as recent research findings in the nutritional and health field which are favorable to sardines. The volume feeding and institutional markets will also be a key target for the first time.

A New York advertising agency is retained by the Council to handle the promotions in cooperation with its Augusta offices.



Maryland

PROGRESS REPORT ON CAUSES OF RED DISCOLORATION IN OYSTERS AND SOFT CLAMS:

Commercial shellfish packers occasionally experience a red coloration in the pack of oysters (*Crassostrea virginica*) and/or soft clams (*Mya arenaris*). Usually the predisposition for color development is not evident at the time of shucking, making the problem even more serious for the packer. One known cause of red coloration is "pink yeast," which grows and develops in the pack, even under proper refrigeration. Apparently these *Torulæ* are quite common, but can be controlled by proper plant sanitation and handling. Another type of red coloration, similar in some respects but differing in others, has been experienced by both oyster packers and soft clam packers. Under rather standardized conditions of oyster and clam packing houses, packs of shellfish during the cool and cold months sometimes develop a very definite, beet-juice or blood-red coloration after three to five days storage under refrigeration.

Oysters exhibiting this phenomenon in the Rappahannock River developed red coloration for periods of about 3 or 4 weeks only, and oysters from these bars were normal after this period. In soft clams in the Chesapeake Bay, in the vicinity of the Bay Bridge at Annapolis, red coloration was noted the first week in October 1957, persisted throughout the winter, finally clearing up in the spring. Soft clams in the Patuxent River, on the

other hand, had only occasional brief occurrences of red coloration.

At the Maryland Chesapeake Biological Laboratory, these problems were attacked:

- (1). Is color production due to the growth of living organisms in the pack after shucking?
- (2). Is color production due to the conversion of non-red pigments in the clams?
- (3). Is color production the release of a red pigment already in the clams?
- (4). What part, or organ, in the clam releases the red pigment?

The development of red coloration is not due to the growth of living organisms, because color developed when the clams were placed in substances inimical or inhibitory to the growth of living organisms. In some cases, color developed faster in the treated clams than in the ones that were not treated. The causative pigment is apparently entirely held in the small brown "liver" or "digestive gland," the small, brownish organ in the clam located near the hinge. This was indicated by carefully dissecting some clams and storing the various parts in separate sterile containers. Only in the containers containing the "liver" did red coloration develop. As to the question of whether

the pigment is a conversion of a nonred pigment, or the simple release of red pigment from this gland, the evidence seems to indicate the red pigment is stored in this gland. When fresh glands from clams that would develop red coloration were streaked on a piece of porous paper, the red material diffused out with the liquid onto the surrounding paper and became visible. Extraction experiments further indicated this pigment is stored in the gland.

Several other pertinent facts were discovered in the course of these investigations.

- (1). Heating at 50° C. (122° F.) for 15 minutes modifies or destroys this pigment, while heating at 40° C. (104° F.) for 30 minutes did not alter the pigmentation. However, the meats became grayish when heated to these temperatures.
- (2). Soft clams held as shell stock for 10 days under refrigeration (4° C. or 39° F.) did not show noticeable red coloration when shucked, while shucked clams from the same lot developed red coloration in the pack.
- (3). Bacteriological tests showed no red bacteria present.
- (4). In some early experiments, red clam liquor from a commercial pack was inoculated into some "nonred" clams and some "non-

Note: See Commercial Fisheries Review, March 1958 p. 25, January 1958 p. 37.

red" oysters. Red coloration developed in the inoculated clams and oysters, while those left uninoculated did not develop red coloration. Later experiments, using freshly dug red clams, did not indicate transmissibility. These circumstances indicate pink yeast coloration may have occurred along with the form of red coloration being studied.

The Chesapeake Bay Institute, Johns Hopkins University, ran experiments to identify the red pigment. By using extraction and adsorption techniques with spectrophotometric analysis, the scientists were able to characterize the red coloration as a plant pigment, probably from microscopic water plants called phytoplankton. The red pigment is probably a carotenoid from these plants. They also found that the "liver" of a clam that will turn red shows a characteristic color under ultraviolet light, while a clam that has no red coloration does not show this fluorescence.

The U.S. Bureau of Commercial Fisheries also investigated several aspects of the red clam problem. Investigations of the phytoplankton in the Chesapeake Bay in the area where red coloration persisted were made throughout the winter. In addition, the Bureau's laboratories at Milford, Conn., and Beaufort, N. C., ran experiments to culture and identify phytoplankton from this area. The results of these studies are not yet available. (Maryland Tidewater News, May-June 1958.)



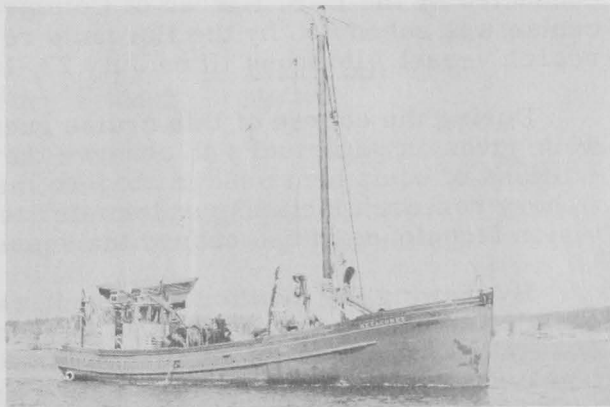
North Atlantic Fisheries Exploration and Gear Research

EXPLORATORY TRAWLING FOR COMMERCIAL QUANTITIES OF LAUNCE BY M/V "METACOMET:" The first in a series of cruises off the New England coast for the purpose of measuring commercial concentrations of launce or sand eels (Ammodytes sp.) was completed by the U. S. Bureau of Commercial Fisheries chartered fishing vessel Metacomet on June 17, 1958.

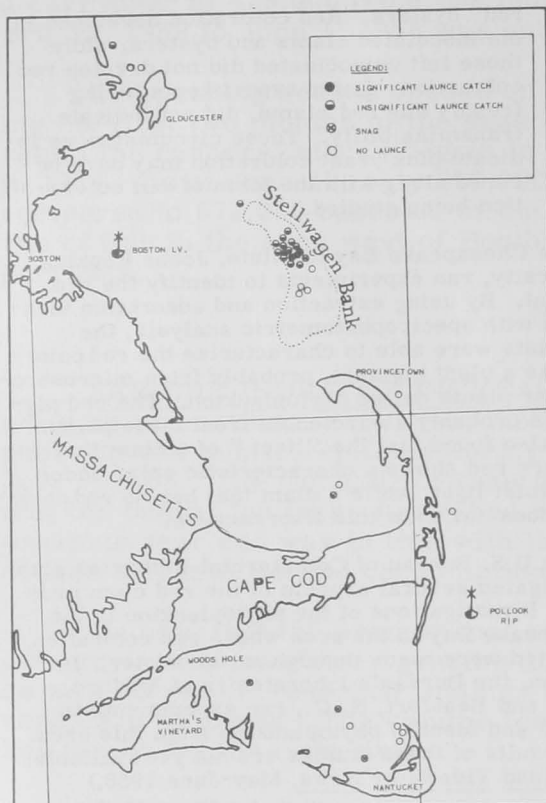
These surveys were initiated due to the fact that a considerable fishery for launce has been developed in Europe. The same or closely related species of Ammodytes has been observed off the Massachusetts coast and in other areas. They are also frequently found in cod stomachs. If concentrations of the sand launce were available, a fishery of value for the reduction plants could be established. This year 400 Danish, 100 West German, and a few Norwegian vessels are participating in the European fishery.

Since the launce fishery began off the Danish coast, 148,604 metric tons have been landed.

Trawling operations off New England were conducted from the M/V Metacomet using the same type trawl used in Holland in the launce fishery. This trawl has several sizes of mesh from 4½ inches in the wings and leading body section, down to six-millimeter (approx. ¼ inch) meshes in the extension--cod-end piece. The head and sweep ropes measure 100 feet each.



Service's chartered vessel M/V Metacomet.



M/V Metacomet exploratory cruise for launce or sand eels in June 1958.

Though commercial concentrations were found to be present in most areas, important commercial catches were made in only one. Other areas gave indications, through traces on the fishscope, that substantial quantities of launce may be available, though none were taken.

The most important catch was approximately five tons of launce caught in four 30-minute tows on Stellwagen Bank off Gloucester, Mass., during daylight hours. Other tows caught substantial quantities of several species, such as haddock, cod, whiting, flounder, scup, squid, and dogfish.

Tests on the diurnal effects, using the fishscope, showed that the launce rose to surface waters at night; other species became more concentrated on the bottom, suggesting that the launce may be taken in quantity by trawls only during daylight hours.

Poor weather conditions for this time of year hampered fishing operations and caused considerable loss of time. Surface water temperatures averaged 53° F.

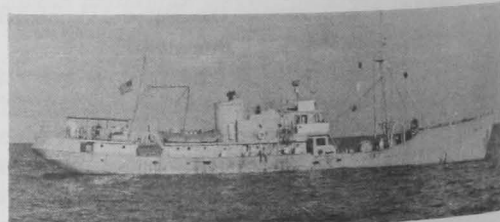


North Atlantic Fisheries Investigations

DEMONSTRATION CRUISE MADE BY M/V "ALBATROSS III:" Due to widespread interest among members of the New England fishing industry in research conducted by the U. S. Bureau of Commercial Fisheries, a one-day demonstration cruise was scheduled by the Bureau's research vessel Albatross III on July 23, 1958.

During the course of this cruise guests were given an opportunity to observe the operations of equipment used in modern marine fishery research including underwater television techniques in use aboard the vessel.

By viewing the monitor screen, it was possible to observe groundfish as they entered the net and their reactions in the cod end. Escapement of small fish through the meshes also were observed. Other types of scientific equipment including a bottom sampler, plankton nets, midwater trawl gear, etc., were demonstrated.



Service's research vessel Albatross III

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GROUND FISH BEHAVIOR STUDIED WITH UNDERWATER TELEVISION (M/V Albatross III Cruise 112): Studies of the behavior and orientation of groundfish were continued by the U. S. Bureau of Commercial Fisheries research vessel Albatross III by means of an underwater television camera. Observations were made between June 9-13 on Stellwagen Bank on the eastern edge of Massachusetts Bay.

sighted. On the 24th a total of 28 commercial salmon trollers were sighted; 9 off Monterey, 8 in the area between San Francisco and Bodega, and 12 off Fort Bragg. On the 25th a total of 34 were sighted; 20 in Monterey Bay and 14 in the San Francisco to Bodega area. The area to the north of Bodega Bay was not covered on the 25th.

Pelagic Fish: Anchovies are beginning to appear at the surface, thus repeating the seasonal behavior of "disappearing" throughout the winter and early spring months and reappearing sometime in April or June. All the schools sighted were very small surface schools. One school was sighted off Pt. Reyes on the 24th and about a dozen schools were sighted in the area between Pedro Pt. and Pigeon Pt. on the 25th. Fishermen working out of Princeton were contacted, and it was disclosed that these small schools were made of small (probably 1957 year-class) anchovies.

* * * * *

SARDINE DISTRIBUTION AND ABUNDANCE OFF SOUTHERN CALIFORNIA SURVEYED FROM AIR (Airplane Spotting Flight 58-2B): To determine the coastal distribution and approximate abundance of sardines and other pelagic fishes off the

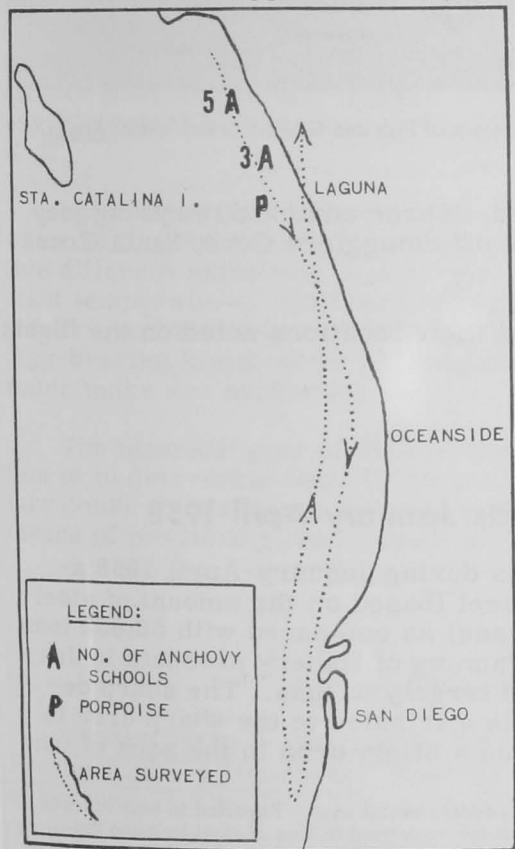


Fig. 1 - Flight (58-2B) of April 17, 1958.

from Malibu to Point Mugu and the area around the islands of Santa Cruz and Santa Rosa was surveyed on April 19.

Fog and overcast hampered work during the first two days, April 17 and 18, and permitted only limited flying with poor visibility.

On April 17, 5 schools of anchovies were observed off Huntington Beach and 3 schools of anchovies were seen in the area around the Newport sewer outfall. A small school of porpoise was noted 1 mile SE. of the Newport beach jetty. Water conditions near shore were muddy but green to dark blue farther offshore.

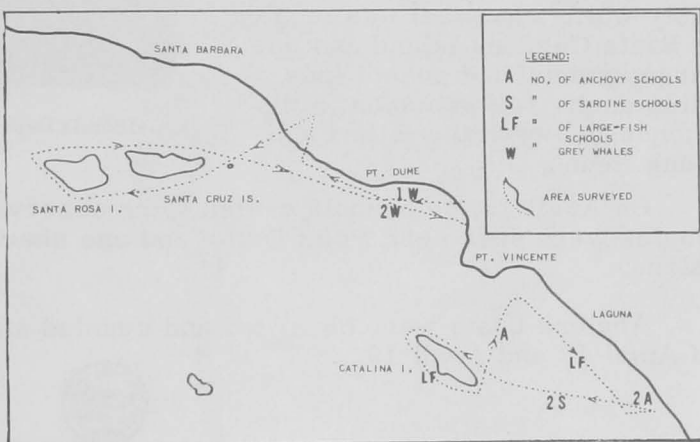


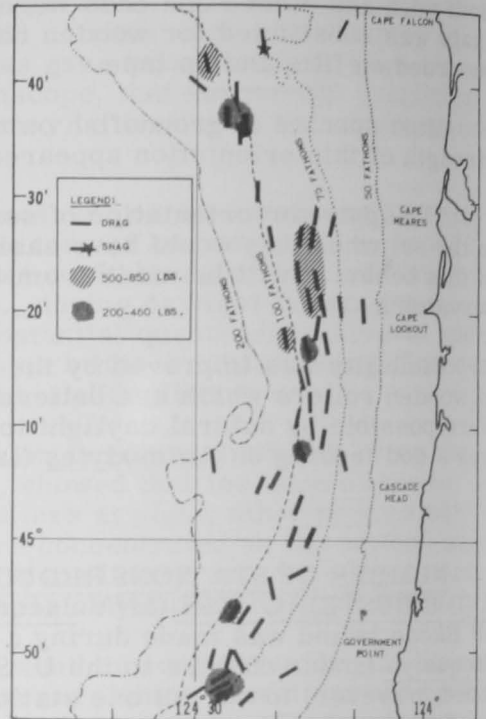
Fig. 2 - Flight (58-2B) of April 18-19, 1958.

coast of southern California was the principal purpose of an airplane spotting flight made by the California Department of Fish and Game with their Beechcraft plane April 17-19. A secondary objective was to locate and count abalone boats working in the area surveyed. The inshore area from Long Beach to the U. S.-Mexican Border was surveyed on April 17. The area 8 to 10 miles offshore from Laguna Beach to Oceanside, from Oceanside to Santa Catalina Island and the area around Santa Catalina Island was surveyed on April 18. The inshore area

The largest concentrations of pink shrimp found during this cruise were at substantially greater depths than previously noted along the coasts of Washington and



Service's research vessel M/V John N. Cobb.



Oregon. During explorations conducted in 1955, 1956, and earlier this year best shrimp concentrations were found at depths between 60 and 85 fathoms. M/V John N. Cobb (Cruise No. 38, June 1958).

Oceanographic and biological observations were made at all stations and representative samples of the catches were preserved for laboratory analysis. The samples will be studied by biologists of the Oregon Fish Commission. Surface water temperatures off the Oregon coast were considerably higher than normally expected for the month of June and a high of 63° F. was recorded.

During the cruise, experiments were conducted on fishing two 43-foot nets simultaneously. The "Texas rig" method of fishing two nets at the same time, commonly used in the Gulf of Mexico, utilize twin booms or "outriggers" to tow one net from each side of the boat. Aboard the John N. Cobb the nets were fished from the standard trawl davits on the stern of the vessel. To preclude fouling, the nets were staggered so that one net fished about 20 fathoms astern of the other. No operational difficulties were encountered during five tests in which two nets were fished in this manner. The resultant catches indicated that the twin-rig method would probably double the yield obtained using a single 43-foot net.

Note: See Commercial Fisheries Review, June 1958, p. 37 and July 1958 for first two cruises in this series.



Oysters

SEED SCARCITY AND PREDATOR PROBLEMS IN ATLANTIC COAST OYSTER INDUSTRY UNDER STUDY: Fresh water is a "deadly poison" to the oyster--a bit of unslaked lime can be the beginning of the end for a starfish--and the oyster drill can't stand fences, if the fences have copper trimming. Such random bits of information, gleaned from fishery biology findings, are among the factors important to the U. S. Bureau of Commercial Fish-

eries program to help the American oyster industry solve its two toughest problems--scarcity of seed oysters and an abundance of predators. Another problem in which the Bureau is helping is the study of unexplained mortality such as that in which 40 to 95 percent of the oysters on the New Jersey side of Delaware Bay perished in the spring of 1957.

The plan calls for the use of refrigerated containers of a size which could be handled from a piggy-back trailer directly into a supermarket's walk-in refrigerator without having to be handled during transit. Each container would have its own refrigerating unit so that the piggy-back trailer could accommodate mixed loads of commodities requiring different temperatures. Project engineers believe that use of such a container would reduce from six to one the number of handlings now required.



Crabs

INVESTIGATION OF BLUE-CRAB ABUNDANCE AND CATCH FLUCTUATIONS:

An investigation to determine the causes of fluctuations in the abundance and catch of blue crab in the Chesapeake Bay area has been initiated by the U. S. Bureau of Commercial Fisheries by awarding a contract to the Oyster Institute of North America to conduct the study. Financed by funds provided by the Saltonstall-Kennedy Act, the researchers hired by the Institute will utilize laboratory facilities provided by the Bureau's Fishery Biological Laboratory at Beaufort, N. C.



Blue Crab

Laboratory facilities provide sea water at five different temperatures or five different salinities at a single constant temperature. Cultures of marine plankton and a number of "sponge" crabs (egg-bearing females) in running seawater tanks are available.

The ultimate goal of this investigation is to determine what factors in nature cause the rather large fluctuations in the year broods of crabs, and to find means of predicting, and possibly controlling, the fluctuations in abundance.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1958: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.1 million pounds (value \$1.2 million) of fresh and frozen fishery prod-

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

QUANTITY				VALUE			
May		Jan.-May		May		Jan.-May	
1958	1957	1958	1957	1958	1957	1958	1957
(1,000 Lbs.)				(\$1,000)			
2,054	2,635	9,310	10,002	1,152	1,274	5,294	5,106

Products were purchased in May 1958 by the Military Subsistence Market Centers. This was lower than the quantity purchased in April by 8.0 percent and 22.0 percent less than the amount purchased in the same month a year ago. The value of the purchases this May was lower by 3.2 percent as compared with the previous month, and down 9.6 percent from May a year ago.

The survey extended from 50 miles north of Kaneohe to 50 miles south with one refueling stop. There were three scientific objectives--estimate the abundance of schools, collect samples of sea water, and measure the water temperature. Each was successful.

In order to estimate fish and bird abundance, the helicopter cruised at 50 feet above the sea, providing excellent visual scouting. There were no fish schools over most of the track, but about 40 miles north of Kaneohe several were sighted and birds were abundant. This information was relayed to the commercial fleet.

Sea-water samples and temperature measurements were made at predetermined stations identical to those occupied by POFI vessels when they conduct an "Oahu monitoring survey." When the helicopter came on station, it stopped, and let down to about 20 feet above the sea. The scientists then lowered devices to collect a water sample and measure temperature. Time on station was about one minute, and all stations were successfully occupied.

During this operation, the survey helicopter was escorted by a "navigator plane." This was necessary because helicopters do not carry as standard equipment the apparatus necessary for precise over-water navigation.

There are three important aspects to the problem of helicopters versus vessels for certain oceanographic missions. One is cost. The just-completed survey would take a POFI vessel about 36 hours at an operational cost of over \$1,000. The helicopter costs about \$90 an air hour, or about \$450 for the operation. The second is the speed. The vessel takes 36 hours and the helicopter takes 4 or 5 hours. The shorter time period enhances the value of the data because time changes in the ocean are greatly reduced.

* * * * *

NEW OCEAN CURRENT AND TUNA IN THE MARQUESAS SURVEYED (M/V Hugh M. Smith Cruise 45): The research vessel Hugh M. Smith of the U. S. Bureau of Commercial Fisheries returned to Honolulu on June 23, after an 88-day, 10,800-mile expedition in which 3 weeks were spent with the M/V Horizon of Scripps Institution of Oceanography, in a study of a newly-discovered ocean current, the Equatorial Undercurrent (now called the Cromwell Current). These investigations were part of the International Geophysical Year program, and were conducted about 1,500 miles southeast of Honolulu. The survey of the current was conducted on the Equator and to a distance of several hundred miles of each side of the Equator.

A new instrument and a new method were employed in these investigations. A current meter, lowered over the side of the drifting vessel, transmitted back to the ship through a conductor cable an electric signal which indicated the apparent direction and velocity of the ocean current. This information was corrected for the ship's drift in order to calculate the true current. To measure the ship's drift, it was necessary to have a fixed reference point. For this purpose deep parachute drogues, attached by wire cable to surface buoys, were placed at depths of about 3,000 feet; also other surface buoys were actually anchored to the bottom where the depth was $2\frac{1}{2}$ to 3 miles.

From the results obtained, this new current, which was first observed by the Fish and Wildlife Service about 4 years ago (by the late Townsend Cromwell, for whom it was named), may be described as a thin ribbon of fast-flowing water--a veritable river in the sea--moving eastward along the Equator beneath a shallow surface layer of westerly flowing South Equatorial Current. This "river" was about 200 miles wide from north to south and between depths of 100 and 500 feet at the longitude where it was studied. It occurs in a part of the Pacific Ocean where

Great Lakes Fishery Investigations

WESTERN LAKE ERIE SURVEY CONTINUED

(M/V Cisco Cruise 5): Trawling operations were conducted in 12 areas in western Lake Erie by the U. S. Bureau of Commercial Fisheries research vessel Cisco during Cruise 5 between June 17-30, 1958. Ten of these areas include stations scheduled for visits every cruise. As during previous cruises, this year yellow perch and smelt made up the bulk of most of the catches. Smelt, except for fry, were not common in catches in extreme western Lake Erie, suggesting the beginning of a general easterly movement of the species. Sheepshead, emerald shiners, spottail shiners, and trout-perch were the only other species regularly caught in large numbers. About 2,700 emerald shiners were taken in one 10-minute tow, but the catch of this species was usually much smaller. Many of the mature sheepshead appeared ripe, but none had spawned. Trout-perch have begun spawning and emerald shiners and spottail shiners are nearing that stage. Other species taken include walleye or yellow pike (very few), silver chub, white sucker, carp, white bass, channel catfish, burbot, white crappie, smallmouth bass, and gizzard shad. The latter species, as well as the alewife, continues to be rare in the catches.

An experimental nylon gill net (mesh sizes 1-, 1½-, 2-, 2½-, 3-, and 4-inch) was set in 4 fathoms off Sandusky. The net was "canned up" so that its float line was 6 feet below the surface. The catch was almost entirely 2-year-old yellow perch except for several smelt which were taken in the smallest mesh.

The examination of large numbers of stomachs of several species of fish taken from Lake Erie

Note: See Commercial Fisheries Review, July 1958, for scientific names of species mentioned in this article.

this year has begun and is progressing satisfactorily. The analyses are being made by the Ohio State University at its Stone Laboratory at Put-in-Bay, Ohio.

In an attempt to gain information regarding vertical movements of fish, gill nets were set obliquely from top to bottom for two-hour periods from mid-afternoon until midnight. Practically no fish were caught until the last set, indicating that there was little movement into midlevels until well after dark.

Fish fry were collected with large-mesh plankton nets which were either towed alongside the boat or attached to the headropes of the trawls, and by use of a "sled" trawl fitted with a bobbinet liner in its cod end and designed to operate on rough bottom. Some of the very small fry are as yet unidentified, but the larger were mostly smelt and yellow perch. Some unidentified pelagic eggs were also taken. Considerable difficulty was encountered with the plankton nets becoming heavily laden with zooplankton, principally Daphnia retrocurva. In spite of the great abundance of crustacean plankton, the water in western Lake Erie was comparatively clear, apparently due to a general scarcity of phytoplankton, especially filamentous diatoms.

Owing to the cool weather which prevailed, water temperatures during Cruise 5 did not increase as much as would be expected at this time of the year. Surface temperatures in the western basin ranged mostly from 18.5° C. (64.3° F.) to 20.0° C. (68.0° F.) but temperatures as low as 16.6° C. (61.8° F.) were recorded off Lorain, Ohio, in the central basin. Thermal stratification was observed in the central basin with the metalimnion just off the bottom in 10 fathoms of water.



Gulf Exploratory Fishery Program

EXPLORATORY AND COMMERCIAL-SCALE FISHING FOR ROYAL-RED

SHRIMP OFF FLORIDA EAST COAST (M/V Silver Bay Cruise 9): During June 1958, the U. S. Bureau of Commercial Fisheries chartered fishing vessel M/V Silver Bay made a shrimp trawling survey off the east coast of Florida. The cruise was divided into two parts: exploratory fishing and royal-red shrimp (Hymenopenaeus robustus) fishing on a commercial scale. The exploratory trawling included 24 drags in depth varying from 25-590 fathoms, 13 of the 24 drags were made in depths greater than 300 fathoms. Although the data gained from this phase of the cruise greatly supplemented existing knowledge of offshore conditions, no significant concentrations of commercially-valuable species were found.

The second phase of the cruise was devoted primarily to simulated production-type fishing for royal-red shrimp. Utilizing a full week of around-the-clock fishing effort, 34 drags were made.

Two types of gear were employed during this part of the cruise; a 65-foot balloon net fished on a bridle with a single warp, and an 85-foot balloon trawl fished with two warps. Bracket-type doors were used with both rigs; 5½-foot doors in combination with the 65 foot net, and 8 foot doors with the 85-foot balloon trawl. Twelve successful tows, with the 65-foot trawl, yielded about 195 pounds of royal-red shrimp (heads-on) per 3-hour drag, 8 drags with the 85-foot balloon trawl averaged 225 pounds of red shrimp per 3-hour tow. Best fishing was found in depths

A special study of sardine distribution, abundance, and biology in Taiohae Bay, Nuku Hiva, was carried out by one of the field party members who was stationed ashore during the period of the tuna surveys.

Stomachs from 5 males and stomachs and ovaries from 5 female skipjack were preserved from each school fished; length, sex, and gonad condition were recorded for 25 fish (occasionally less) from each school. One plankton haul was made each night on the runs between Hawaii and the Equator, 140° W., and from the Marquesas to Hawaii; and 3 hauls were made each night during the offshore tuna survey.

Secchi disc and water color observations were taken at noon each day while in the Marquesas. Using a photometer, depths of 10, 5 and 1 percent light transmission were measured at specified intervals during the Undercurrent survey and from 5° S. to 10° N. on the run between the Marquesas and Hawaii. Surface trolling was conducted with two lines at almost all times during daylight hours when the vessel was under way. All tuna schools, birds, and aquatic mammals sighted during the daylight runs were recorded. Several specimens of possibly poisonous fishes were frozen for use in fish toxicity studies being conducted at the University of Hawaii. Four night-light collections were made in the region of the Equator, 140° W., and one in Tautira Bay, Tahiti. The standard marine weather observations were made four times daily and transmitted whenever radio conditions permitted.

Two employees of the Hawaii Division of Fish and Game accompanied the vessel to the Marquesas where they were put ashore, and during the period of the tuna surveys collected about 3,000 reef fishes, mostly snappers and sea bass, and also 70 specimens of fresh-water shrimp, which were held alive and transported back to Hawaii for stocking.

* * * * *

TUNA TAGGING DEVELOPMENTS: During July of 1957 the Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations conducted a Northeastern Pacific Albacore Survey, which involved the research vessels Hugh M. Smith, the John R. Manning, and several chartered vessels. During the course of this survey a number of tagged albacore tuna were released into the sea. Near the end of June, on the same day, two of these tags were returned from Japan where they had been recovered by Japanese fishermen during May and June 1958. Both of the tagged fish had crossed the Pacific, a journey of more than 4,000 miles, in less than a year and were retaken in the Japanese live-bait fishery off southern Japan. One of the recoveries was particularly interesting because it was the first albacore recovered with a POFI-developed dart tag. It was one of the 111 albacore released with dart tags by the Hugh M. Smith and John R. Manning during NEPAS. These recoveries bring the total POFI recoveries of tagged albacore to 11. There were fish tagged in midocean north of Hawaii which moved in both directions and were recaptured in the Japanese fishery as well as in the American fishery. And then there were these fish tagged in the eastern Pacific and retaken in the western Pacific. The results would seem to support the hypothesis that there is but a single population of albacore in the North Pacific.

During May 1958, approximately 2,000 skipjack tuna were tagged by POFI from a chartered sampan off Hilo. By the end of June over 16 percent of these tags had been recovered from tagged fish taken in the Hilo fishery. There had been no recovery of tags from this group apart from the Hilo fishery. These fish were small fish of approximately 4 to 6 pounds in weight and since the original tagging the fish had apparently remained very much in the same areas for more than a month and a half.

Approximately 2,000 tags were also released from another chartered sampan around the island of Kauai. Since the release, only a single tag has been recovered,

Lobsters

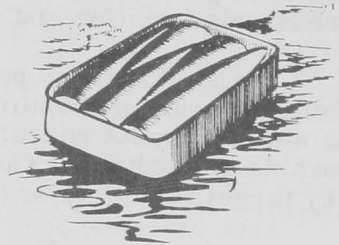
CANNED CATFOOD USED AS SPINY LOBSTER BAIT: In Key West, Fla., spiny lobster fishermen have turned from the fish heads and noncommercial or trash fish normally used for bait in lobster pots to canned cat food (made with a fish base). Two holes are punched in an 8-oz. can which is wired into the pot. The canned bait is as effective as the previously used waste fish and lasts, even in warm tropical waters, up to a week. It has the additional advantage that, unlike the customary bait, the trapped spiny lobster cannot consume it.



Maine Sardines

SEASON OFF TO SLOW START: The Maine sardine canning season was off to a slow start with production as of the week ending June 6 only about 1 percent of the total for the same date last year. Several plants working sporadically had packed a total of about 3,000 cases as compared with 271,000 cases of canned Maine sardines in the same period of 1957, a June 11 news release from the Maine Sardine Council points out.

About 33 plants were ready to operate, but the fish supply had been so limited that it was impossible to start full-scale production on an efficient basis. The industry expected increased operations would begin soon since conditions seemed to be ideal for the usual June run of fish.



The 3,000 cases processed was the smallest pack as of the first week in June for 20 years and minute in comparison with 1954 when the industry had produced 501,000 cases. Packs for similar periods in other years were as follows: 1951--87,000; 1952--297,000; 1953--207,000; 1955--44,000; and 1956--95,000 cases.

The industry is again faced with higher operating costs, for the sixth year in a row, due to increases in the price of cans and other items.

* * * * *

CANNED STOCKS JUNE 1, 1958: Distributors' stocks of Maine sardines totaled 237,000 actual cases on June 1, 1958--7,000 cases or 3 percent more than the 230,000 cases on hand June 1, 1957. Stocks held by distributors on April 1, 1958, amounted to 293,000 cases, and on January 1, 1958 totaled 230,000 cases, according to estimates made by the U. S. Bureau of the Census.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, June 1, 1958, with Comparisons

Type	Unit	1957/58 Season				1956/57 Season			
		6/1/58	4/1/58	1/1/58	11/1/57	7/1/57	6/1/67	4/1/57	1/1/57
Distributors	1,000 Actual Cases	237	293	230	298	212	230	295	347
Canners	1,000 Std. Cases 1/	235	476	1,111	1,337	895	416	465	879

1/ 100 3/4-oz. cans equal one standard case.

Canners' stocks on June 1, 1958, totaled 235,000 standard cases (100 3/4-oz. cans), a decrease of 181,000 cases (44 percent) as compared with June 1, 1957, and a decrease of 78.2 percent (876,000 cases) from the 1,111,000 cases on hand January 1, 1958. The total supply for the 1957 season (April 15-December 1) was close to 2,543,000 standard cases. This amount includes a pack of 2,117,000 cases plus

pond was drained at the completion of the experiment. Growth of the fish on only natural foods present in the pond was considered good, and their survival was termed excellent.

Although growth of approximately 3,000 fry planted in the Aurora pond was better than growth of fish in the Salem pond, only 7 percent of the original plant could be accounted for when the pond was emptied. Discovery of at least 90 largemouth bass in the Aurora pond was more than likely the reason for the poor survival. Presence of the bass was not detected until several months after the experiment began.

The Assistant Director states, "We are reasonably convinced that juvenile silver salmon will fare well in certain ponds, but the basic question still unanswered is how well the fish will survive after they are released from a natural rearing pond." He said experiments with fin-clipped fish that have been raised in larger bodies of water will have to be carried out to gain information on this aspect of the natural rearing proposal.

The Commission now has two persons spending a major part of their time on the prospects of pond rearing salmon and steelhead. The program now amounts to finding suitable impoundments that can be used for larger-scale experiments. Particular attention is being given to raising small salmon in some of the lakes in the lower Columbia River gorge. Construction of one or more impoundments strictly for salmon production is being considered if suitable sites can be located.

* * * * *

RESEARCHERS PROBE PROBLEMS OF PROPAGATION: A four-point program in the continuing effort to solve problems incident to salmon propagation was announced June 16 by United States Fish and Wildlife Service. Work will consist of research on disease, nutrition, improvement of hatchery techniques for Pacific salmon, and various studies related to the restoration of the Atlantic salmon.

The research will be done primarily by biologists and technologists of the Service but about half of the work on salmon disease studies will be contracted to State fishery agencies in Oregon and Washington and the University of Washington. The Service biological research facilities in Seattle, Willard, and Entiat, Wash., and in Boothbay Harbor, Maine, will be used in the investigations. Maine agencies are cooperating on Atlantic salmon projects.

The disease research will include studies on parasites as purveyors of disease in the hatcheries and in the streams; columnaris and related ailments, especially on recognition and control of the virulent strains; red mouth disease; and laboratory probing of marine types of disease organisms and their relation to marine survival of salmon.

There are several nutrition studies in various stages of completion and work on these will be continued. These include salmon requirements of amino acid, fatty acids, vitamins, minerals and carbohydrates; development of water-soluble and fat-soluble vitamin test diets; and characteristics of digestive enzymes of salmonids.

Hatchery improvement at Entiat is for the development of improved techniques and equipment--rearing pond design, high humidity incubators, diversion, holding, spawning, accelerated maturation, algae control, and practical diet testing.

The headquarters for the Atlantic salmon restoration investigations will be in the Bureau of Commercial Fisheries laboratory at Boothbay Harbor, Maine, but

the pigment is a conversion of a nonred pigment, or the simple release of red pigment from this gland, the evidence seems to indicate the red pigment is stored in this gland. When fresh glands from clams that would develop red coloration were streaked on a piece of porous paper, the red material diffused out with the liquid onto the surrounding paper and became visible. Extraction experiments further indicated this pigment is stored in the gland.

Several other pertinent facts were discovered in the course of these investigations.

- (1). Heating at 50° C. (122° F.) for 15 minutes modifies or destroys this pigment, while heating at 40° C. (104° F.) for 30 minutes did not alter the pigmentation. However, the meats became grayish when heated to these temperatures.
- (2). Soft clams held as shell stock for 10 days under refrigeration (4° C. or 39° F.) did not show noticeable red coloration when shucked, while shucked clams from the same lot developed red coloration in the pack.
- (3). Bacteriological tests showed no red bacteria present.
- (4). In some early experiments, red clam liquor from a commercial pack was inoculated into some "nonred" clams and some "non-

Note: See Commercial Fisheries Review, March 1958 p. 25, January 1958 p. 37.

red" oysters. Red coloration developed in the inoculated clams and oysters, while those left uninoculated did not develop red coloration. Later experiments, using freshly dug red clams, did not indicate transmissibility. These circumstances indicate pink yeast coloration may have occurred along with the form of red coloration being studied.

The Chesapeake Bay Institute, Johns Hopkins University, ran experiments to identify the red pigment. By using extraction and adsorption techniques with spectrophotometric analysis, the scientists were able to characterize the red coloration as a plant pigment, probably from microscopic water plants called phytoplankton. The red pigment is probably a carotenoid from these plants. They also found that the "liver" of a clam that will turn red shows a characteristic color under ultraviolet light, while a clam that has no red coloration does not show this fluorescence.

The U.S. Bureau of Commercial Fisheries also investigated several aspects of the red clam problem. Investigations of the phytoplankton in the Chesapeake Bay in the area where red coloration persisted were made throughout the winter. In addition, the Bureau's laboratories at Milford, Conn., and Beaufort, N. C., ran experiments to culture and identify phytoplankton from this area. The results of these studies are not yet available. (Maryland Tidewater News, May-June 1958.)



North Atlantic Fisheries Exploration and Gear Research

EXPLORATORY TRAWLING FOR COMMERCIAL QUANTITIES OF LAUNCE BY M/V "METACOMET:" The first in a series of cruises off the New England coast for the purpose of measuring commercial concentrations of launce or sand eels (Ammodytes sp.) was completed by the U. S. Bureau of Commercial Fisheries chartered fishing vessel Metacomet on June 17, 1958.

These surveys were initiated due to the fact that a considerable fishery for launce has been developed in Europe. The same or closely related species of Ammodytes has been observed off the Massachusetts coast and in other areas. They are also frequently found in cod stomachs. If concentrations of the sand launce were available, a fishery of value for the reduction plants could be established. This year 400 Danish, 100 West German, and a few Norwegian vessels are participating in the European fishery.

Since the launce fishery began off the Danish coast, 148,604 metric tons have been landed.

Trawling operations off New England were conducted from the M/V Metacomet using the same type trawl used in Holland in the launce fishery. This trawl has several sizes of mesh from 4½ inches in the wings and leading body section, down to six-millimeter (approx. ¼ inch) meshes in the extension -- cod-end piece. The head and sweep ropes measure 100 feet each.



Service's chartered vessel M/V Metacomet.

South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1958: Oyster Research: Oyster studies during April-June 1958 have dealt primarily with growth and mortality of oysters; methods of producing seed oysters; cultivation of oysters in ponds; and some detailed studies on internal temperatures of oysters, according to Progress Report No. 36 (April-June 1958) of the Bears Bluff Laboratories.

Oysters began setting on May 17, with a heavy spat fall. Several types of cultch have been planted in We Creek and Wadmalaw River to obtain seed oysters. Seed oysters will be shipped soon, on an experimental basis, to the Virgin Islands, Louisiana, and New York State.

Two types of cultch are being tested for the Division of Tidewater Fisheries of Maryland. Dredged oyster shell and shell from the soft clam (*Mya*) have been shipped to the Wadmalaw Island Research Station where they were placed overboard in wire baskets. A comparison is being made between the normal South Carolina steamed shell cultch and these two types of cultch from Maryland. Since these tests could be made earlier in South Carolina than in Maryland, the results can help the Division of Tidewater Fisheries of Maryland decide whether or not this cultch is suitable, and allow them to plant with greater confidence. The Maryland dredged shell, so far, has proven almost as satisfactory as South Carolina steamed cultch. The clam shells, while catching a fair number of oyster spat, are not as suitable because of the lower survival rate than on oyster shells. Just why this is so has not yet been determined.

Good quality seed oysters collected last year on cement-dipped cardboard have shown good growth in the one-acre experimental pond during the year. In approximately 11 months the majority of these oysters have reached a length of three inches, with some even exceeding this figure. Seed oysters collected on steamed cultch and planted in the pond in 1957 have not grown as well; the majority are now from 2 to 2½ inches in length.

Using a thermometer built into the core of a hypodermic needle, internal temperatures of oysters have been studied in relation to external temperatures. There is a considerable lag in the internal temperature of an oyster in an environment of changing temperatures. These investigations, being carried on under the Hughes grant, are still in their preliminary stages.

Note: See Commercial Fisheries Review, May 1958, p. 40.

Shrimp Survey: The brown-spotted or pink shrimp (*Penaeus duorarum*) were extremely abundant during the second quarter of 1958--roughly five times as abundant in experimental trawls as in the similar periods of 1953-1957.

White shrimp (*Penaeus setiferus*) have been and are still almost completely absent from South Carolina waters. Only a few large roe shrimp are occasionally taken in offshore waters. Almost all of the wintering-over population of white shrimp were killed by the extreme cold in February.

Brown shrimp (*Penaeus aztecus*) are unusually abundant this year. They first made their appearance in early June in creeks and rivers. By mid-June they had begun to enter the commercial catch in small size and in small numbers; however, during the last week in June, still small in size, brown shrimp are being landed at a rate of an estimated 10,000 pounds a day.

Fish Studies: Fish, particularly spot, croaker, mullet and menhaden, in June were beginning to become fairly abundant, but are about a month late this year.

Exploratory fishing off the coast in the second quarter of 1958 has been confined to one cruise out to the 50-fathom curve. A new depth recorder recently borrowed from the Gulf Fisheries Exploration and Gear Research station of the U. S. Bureau of Commercial Fisheries, has been installed and is an excellent help in offshore work. This recorder is capable of reading to a depth of 2,400 feet. On this cruise good catches of snapper, grouper, and scup or porgy were made east of Charleston.

Crab Studies: Due to the extremely cold winter, crabs were almost completely unavailable until after mid-March. Since then they have been more abundant than any year since Bears Bluff Laboratories has been keeping records on crabs.

The joint tagging program carried on by the U. S. Bureau of Commercial Fisheries out of Beaufort, N. C. and by this Laboratory, has shown some interesting results. The tag returns have not been numerous and the majority, by far, have been returned from within a few miles of the mouth of the North Edisto River where the crabs were released. However, tags have been returned from Charleston, 20 nautical miles to the north; from several localities in St. Helena Sound, 15 miles to the south; from the vicinity of Port Royal Sound, 30 miles to the south; and from St. George's Island, Florida, 150 miles to the south.



Transportation

PROPERTY TRANSPORTATION TAX REPEALED: The fishing industry will realize an estimated reduction in transportation costs of about \$2 million annually because of the repeal of the 3 percent property transportation tax, as provided by the "Tax Rate Extension Act of 1958" (P. L. 475 - 85th Congress) which was signed by the President on June 30, 1958. This was the only tax reduction made by this session of Congress.

The bill provides for the elimination of the tax to be effective on all payments made for transportation of property on or after August 1, 1958, regardless of when the movement took place, with the exception of some oil pipeline movements, for which transportation must originate on or after August 1, 1958.

The transportation tax is levied on the payer of transportation for hire which includes rail freight and express; contract and exempt trucking; and domestic air and water transport.



Tuna

LOCATION OF PACIFIC SEAMOUNTS MAY AID FISHERY: A potential new source of tuna has been added to the Pacific tuna resources by new information for accurately locating seamounts, recently released by the U. S. Naval Hydrographic Office. Seamounts, or underwater mountains, have been demonstrated to be points of concentration of the rapidly-moving schools of offshore Pacific tunas. One known seamount was credited during 1957 as the source of tuna production valued at \$2 million ex-vessel. The information now available on seven new seamounts could theoretically account for an astounding \$14 million increase in tuna production; however, all seamounts are not equally

productive and various other factors fluctuate, so that this theoretical value could be less.

As new Hydrographic Office charts are reprinted, the depth and location of each of these seven previously-unrecorded seamounts will be published.

The following soundings, 300 fathoms or less, with their approximate position, were found: 46 fathoms 07°10'N. 79°05'W.; 50 fathoms 07°20'N. 79°35'W.; 105 fathoms 01°26'N. 80°07'W.; 260 fathoms 00°57'S. 87°45'W.; 265 fathoms 25°00'S. 97°40'W.; 186 fathoms 25°55'S. 100°42'W.; and 160 fathoms 10°32'S. 137°43'W.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS EXPORTS, MARCH AND APRIL 1958: March 1958: United States exports of processed fish and shellfish in March 1958 were lower by 22.9 percent in quantity and 37.5 percent in value as compared with February 1958. Compared with the same month in 1957, the exports in March 1958 were down by 73.0 percent in quantity and 64.3 percent in value.

Table 1 - U. S. Exports of Edible Fishery Products, March 1958 With Comparisons

Item	Quantity			Value		
	Mar.	Year		Mar.	Year	
	1958	1957	1957	1958	1957	1957
	(Millions of Lbs.)			(Millions of \$)		
Fish and shellfish:						
Processed only (excluding fresh and frozen)	2.1	7.9	69.7	0.5	1.4	16.8

Table 2 - U. S. Exports of Edible Fishery Products, April 1958 With Comparisons

Item	Quantity			Value		
	Apr.	Year		Apr.	Year	
	1958	1957	1957	1958	1957	1957
	(Millions of Lbs.)			(Millions of \$)		
Fish and shellfish:						
Processed only (excluding fresh & frozen) 1/	1.3	3.2	69.7	0.3	0.7	16.8

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

April 1958: United States exports of processed fish and shellfish in April 1958 were lower by 30.0 percent in quantity and 40.0 percent in value as compared with March 1958. Compared with the same month in 1957, the exports in April 1958 were down by 58.4 percent in quantity and 57.1 percent in value. The sharp decreases in March and April 1958 in both quantity and value

as compared with the same months of 1957 were due primarily to a shortage of canned Pacific and jack mackerel, and California sardines.

* * * * *

GROUND FISH FILLET IMPORTS, JUNE 1958: Imports of groundfish (excluding ocean perch) fillets and blocks in June 1958 amounted to 10.2 million pounds. As compared with the corresponding month of last year, this was an increase of 79,000 pounds (less than 1 percent).

Canada was the leading country with 8.3 million pounds--an increase of 1.5 million pounds compared with last year. Denmark was next with 1.2 million pounds, followed by West Germany with 456,000 pounds and Iceland 163,000 pounds. The remaining 76,000 pounds were accounted for by the Netherlands and the United Kingdom.

Imports of groundfish and ocean perch fillets and blocks into the United States during the first six months of 1958 totaled 66.6 million pounds. Compared with the same period of last year, this was an increase of 139,000 pounds (less than 1 percent). Shipments originating in Canada comprised 69 percent of the total during the 1958 period, while Iceland made up 16 percent of the total, and Denmark accounted for 10 percent. The remaining 5 percent was represented by West Germany, Norway, Miquelon and St. Pierre, the Netherlands, France, the United Kingdom, Japan, and the Union of South Africa.

Note: See Chart 7 in this issue.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1958 at the 12½-percent rate of duty has been established as 44,693,874 pounds. Any imports in excess of this established quota will be dutiable at 25 percent ad valorem.

Imports from January 1-May 31, 1958, amounted to 16,035,401 pounds, according to data compiled by the Bureau of Customs. Last year from January 1-June 1 a total of 15,667,098 pounds had been imported.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, MARCH 1958: Imports of most fishery products were lower in March 1958 than in March 1957. The major exception was for imports of canned salmon which were six times those of March 1957.

Imports of most fishery products declined in the first three months of 1958 as compared to the first three months of 1957. The only major products with increases in the first quarter of 1958 were swordfish, canned salmon, canned sardines, canned crab meat, and fish meal.

Exports of major fishery products in the first quarter of 1958 also declined, with the exception of frozen shrimp, shucked oysters, and sardines canned in oil, all of which were exported in larger quantities. Significant declines were noted in canned mackerel, sardines not in oil, canned California anchovies, and fish oils.

Imports: GROUND FISH: In January-March 1958 the imports of groundfish fillets declined 17 percent below the same period in 1957. Imports of groundfish blocks were about the same in both periods. Total fillet and block imports in January-March 1958 amounted to 30.9 million pounds.

FROZEN TUNA: During the first three months of 1958 imports totaled 32 million pounds, or 13 percent less than the

same period in 1957. Imports of frozen albacore declined 31 percent and imports of other tuna remained practically unchanged.

CANNED TUNA: Imports in January-March 1958 amounted to 8.6 million pounds, 2 percent more than those of the comparable period of 1957. Canned albacore tuna (2 million pounds) composed a much smaller share of the total canned tuna imports in the 1958 period.

TUNA LOINS AND DISCS: Imports during January-March amounted to 2.1 million pounds, an increase of 9 percent over the same period in 1957.

CANNED BONITO: Imports continued below the 1957 levels. Imports in January-March 1958 amounted to 2.6 million pounds, 34 percent below the same period in 1957.

CANNED SALMON: Imports of 6.7 million pounds in March 1957, a sixfold increase over March 1957, brought the total for January-March to 11.9 million pounds, an increase of 90 percent over the January-March 1957.

CANNED SARDINES: Imports for the first three months of 1958 were 7.5 million pounds, an increase of 29 percent as compared with the same period in 1957.

SWORDFISH: During the first quarter of 1958, imports totaled 4.7 million pounds, a little more than in the first quarter of 1957.

SHRIMP: During the first three months of 1958, imports of 15.1 million pounds were 2 percent less than in the same period of the previous year.

FRESH OR FROZEN LOBSTERS: Imports in the first three months of 1958 of 10.2 million pounds declined 19 percent below the first quarter of 1957.

CANNED CRAB MEAT: Imports in the first quarter of 1958 totaled 1.2 million pounds, 16 percent more than in the first quarter of 1957.

FISH MEAL: First quarter 1958 imports totaled 26,148 tons, 16 percent more than in the first quarter last year.

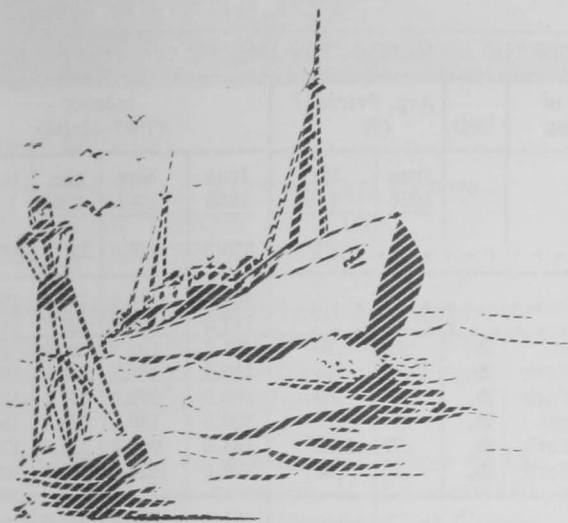
Exports: CANNED SARDINES: During January-March 1958, exports of sardines not in oil were 67 percent less than in the comparable period of a year earlier.

CANNED SALMON: In the first three months of 1958, exports were 335,000 pounds, down 67 percent from the 1957 period.

CANNED MACKEREL: In January-March 1958, exports of 1.5 million pounds were 84 percent less than the 9.4 million pounds imported in the first three months of 1957.

CANNED ANCHOVIES: Exports of miscellaneous canned fish (principally canned anchovies) during the first three months of 1958 totaled 746,000 pounds as compared with 4.9 million pounds for the same period of the previous year.

FISH OIL: Exports for January-March 1958 of 26.5 million pounds were down 25 percent from the same period a year earlier.



Wholesale Prices, June 1958

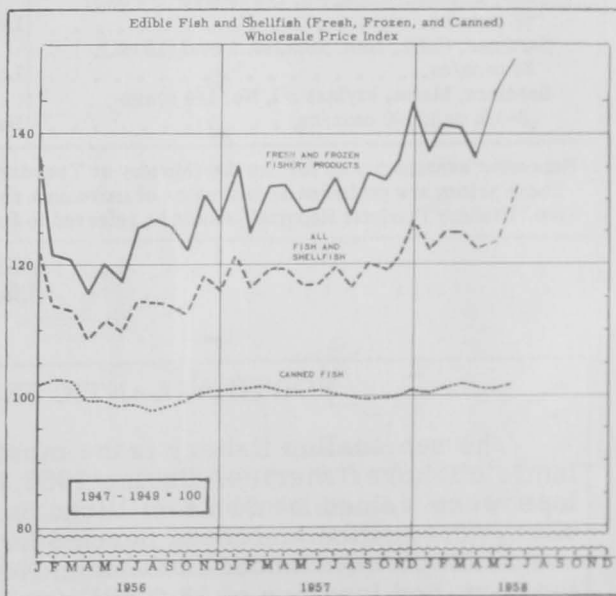
Over-all landings, stocks of frozen fishery products, and canned fish packs were lighter in June this year than for the same month in 1957. The June edible fish and shellfish (fresh, frozen, and canned) wholesale price index (131.5 percent of the 1947-49 average) increased about 2.3 percent over the preceding month and was 12.2 percent higher than for the same month of 1957. The June 1958 index was the highest recorded for any month since January 1947, the beginning of the base period for the current index.

Price trends for the drawn, dressed, and whole finfish subgroup were mixed in June this year with the increases just about offsetting the decreases (net decrease 0.7 percent). From May to June prices increased for fresh large offshore haddock (up 19.6 percent), fresh western halibut (up 16.0 percent), and Great Lakes yellow pike (up 15.8 percent). These increases were balanced by declines of 30 percent for whitefish at Chicago and New York and a 6.3-percent decline in fresh king salmon prices, due to seasonally better supplies. As compared with June 1957 prices for the subgroup this June were higher by 32.4 percent. Prices were higher in June this year than in the same month in 1957 for fresh large offshore haddock (up 59.0 percent), fresh western halibut (up 23.1 percent), red king salmon (up 21.0 percent), and yellow pike (26.5 percent); these increases more than offset substantial declines in Lake Erie and Lake Superior whitefish prices.

The fresh processed fish and shellfish subgroup rose by 6.0 percent in June this year as compared with the preceding month and was also up by 7.6 percent from June 1957. The catch of fresh East Coast shrimp was below normal and as a result prices at New York for 26-30 count headless shrimp jumped 8.9 percent from May to June this year and were higher by 10.6 percent as compared with June 1957. Fresh small haddock fillets at Boston were sharply higher (21.6 percent) this June as compared with the same month a year ago and 1.4 percent higher than the previous month in accordance with higher ex-vessel prices for drawn haddock.

Frozen processed fish and shellfish were higher by 4.2 percent in June this year as compared with the preceding

month. Higher wholesale prices for frozen shrimp (8.6 percent) at Chicago more than compensated for a slight drop in prices for haddock and ocean perch fillets from May to June. All of the subgroup items (except for flounder fillets which were unchanged) were higher in June this year



as compared with June a year ago and resulted in a 7.4 percent increase in the index for the group.

Canned fishery products prices in June this year when compared with the preceding month and with the same month in 1957 continued to show an upward trend. In June 1958 the

index increased 0.4 percent from the preceding month and was 3.5 percent above June last year. All canned fishery products, with the exception of Maine sardines (up 3.4 percent) were unchanged from May to June this year. But compared with the same month in 1957, the June 1958 index was higher because of increases of 26.1 percent for

California sardines, 4.0 percent for tuna, and 0.7 percent for Maine sardines. In June this year the market was firm for most canned fishery products due to a healthy inventory situation and lighter packs, especially Maine sardines, California mackerel, and anchovies.

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)			
			June 1958	May 1958	June 1958	May 1958	Apr. 1958	May 1957
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					131.5	128.6	122.9	117.2
Fresh & Frozen Fishery Products:					150.4	146.0	136.4	128.5
Drawn, Dressed, or Whole Finfish:					147.2	148.3	123.6	111.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.10	121.6	101.7	80.9	76.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.35	123.8	106.7	104.7	100.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.75	.80	168.5	179.8	149.2	139.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.54	.77	132.6	190.9	183.4	154.9
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.70	1.00	141.6	202.2	136.5	176.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.55	.48	129.0	111.4	72.7	102.0
Processed, Fresh (Fish & Shellfish):					151.3	142.7	142.0	140.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.37	.36	124.2	122.5	107.2	102.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.04	.95	163.5	150.1	148.5	147.8
Oysters, shucked, standards	Norfolk	gal.	5.63	5.50	139.2	136.1	139.2	142.3
Processed, Frozen (Fish & Shellfish):					139.7	134.1	132.4	130.1
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	103.4	103.4	103.4	103.4
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.34	102.0	106.7	109.9	91.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.29	.30	116.8	118.8	118.8	112.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.99	.91	152.0	140.0	135.8	145.8
Canned Fishery Products:					104.7	104.3	104.3	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	23.00	23.00	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.65	11.65	84.0	84.0	84.0	80.8
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.68	5.68	132.4	132.4	132.4	105.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	7.75	7.50	82.5	79.8	79.8	81.9

^{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.



NORTH ATLANTIC SEA SCALLOP FISHERY

The sea scallop fishery is the most valuable of the United States North Atlantic offshore fisheries. During 1955, total United States landings of sea scallops were valued at \$11.4 million. In the same year, haddock landings were worth \$8.1 million and ocean perch \$6.0 million. Another \$0.7 million worth of sea scallops were landed in Canada. New Bedford, Mass., the major sea scallop port, had landings of 13.9 million pounds worth \$7.2 million.

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