

TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

First documents as fishing craft were received by 105 vessels of 5 net tons and over during August 1949—57 less than in August 1948, according to the Bureau of Customs of the Treasury Department. California led with 33 vessels documented, followed by Washington with 11, and Florida with 10. A total of 727 vessels were documented during the first 8 months of 1949, compared with 844 during the corresponding period in 1948.

Section	August		Eight mos. ending with August		Total 1948
	1949	1948	1949	1948	
	Number	Number	Number	Number	
New England	5	7	25	39	52
Middle Atlantic	4	4	38	34	40
Chesapeake Bay	5	7	49	36	59
South Atlantic and Gulf	38	80	243	355	541
Pacific Coast	46	53	262	270	347
Great Lakes	2	4	31	33	51
Alaska	4	7	75	70	81
Hawaii	-	-	3	7	12
Unknown	1	-	1	-	-
Total	105	162	727	844	1,183

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



Atom Energy to Aid Shellfishery Research

An agreement has been concluded between the U. S. Fish and Wildlife Service and the Atomic Energy Commission to conduct cooperative research on shellfish and other marine organisms using radioactive tracer methods. The Acting Director of the Service announced on October 14 that the new research project—a survey of radioactivity in marine invertebrate animals—will be conducted at the U. S. Fisheries Biological Laboratory at Beaufort, N. C. The agreement between the Service and the AEC provides for cooperative financing and supervision of the research project.

One main objective of the study is to learn more about the accumulation in marine life of radioactive material and its possible effects on shellfish.

Another objective is to learn more about the natural foods required by oysters for growth and fattening. Conditioning oysters for market has always been a problem of oyster growers.

It has long been known that oysters feed on one-celled plants and animals and other minute organisms or plant detritus normally abundant in sea water.

These food materials are removed from the gallons of water per day which are filtered through the oyster's gills. Some food items are accepted by the oyster and passed into the mouth but not all are digested. Others are rejected. There is still disagreement among scientists because of insufficient information on the food organisms used by oysters. Consequently, no successful method of artificially feeding or conditioning oysters has ever been developed. The staff of the Beaufort Laboratory will attack this problem by using minute amounts of radioactive chemical substances furnished by the Atomic Energy Commission's Isotope Division at Oak Ridge, Tennessee.

The organisms supposed to be the food of oysters will be grown in water containing radioactive chemicals which they will absorb. The activated organisms will then be fed to experimental oysters in the Laboratory and the nutrients which are digested and incorporated into the tissues will then be determined chemically and by radiation measurement.

This is the "tracer technique" made possible in the last three years by the use of radioisotopes produced and distributed by the AEC for widespread research throughout the nation and in other countries. Because of the sensitivity of the new instruments for measuring minute amounts of radiation, the analysis of the chemical composition of any substance containing radioactive tracer atoms, even to a millionth of one percent, is far more accurate than was possible by conventional chemical methods.



Draft Agreement Accepted for General Mediterranean Fisheries Council

A six-country conference was held in Rome at the European Regional Office of FAO, September 19 through September 23, 1949, for the purpose of establishing a General Fisheries Council for the Mediterranean, according to an announcement from FAO headquarters in Washington, D. C. The delegates unanimously accepted a draft agreement for the establishment of a regional council for the scientific exploration of the sea in the Mediterranean Sea and contiguous waters. It will be referred to the next Annual Conference of FAO in November 1949 and then submitted to interested FAO Member Countries. If ratified by five of them, it will become effective. The meeting was attended by delegates from France, Greece, Italy, Lebanon, Turkey, and Yugoslavia.

Meanwhile an interim committee will undertake the preparatory work.

The status of the forthcoming General Fisheries Council for the Mediterranean is on the whole analogous to that of the Indo-Pacific Fisheries Council and calls for coordinating of research and recommending to Member Governments measures necessary to make the best possible use of the resources of the sea. (See Commercial Fisheries Review, October 1949, page 29.)



ECA Procurement Authorizations for Fishery Products

During September 1949, the procurement authorizations for commodities and raw materials announced by the Economic Cooperation Administration included \$523,000 for the purchase of fishery products (all from the United States and Possessions), compared with \$818,000 during August 1949. Total amount authorized for the 18-month period through September 30, 1949, was \$34,840,911.

ECA during September announced the decrease of \$150,000 in authorizations to be used by Italy for the purchase of salted fish from Canada and \$233,000 to be used by Ireland for the purchase of canned fish from the United States and Possessions.



Details of the ECA program to give small independent firms a greater chance to supply goods for European recovery were announced in September. Program provides small independent firms with a counseling service in exporting under the

ECA Procurement Authorizations for Fishery Products, September 1949			
Product	Country of Origin	Recipient Country ^{1/}	Amount Authorized
Canned Fish	U. S. & Possessions	Belgium-Luxembourg	\$ 500,000
Sperm & polymerized fish oil	U. S. & Possessions	France	23,000
Total for Sept. 1949			523,000
Total ECA Procurement Authorizations for Fishery Products, April 1, 1948-Sept. 30, 1949			
Fish, canned	U. S. & Possessions & Canada	United Kingdom, Ireland, Greece, Italy, Belgium-Luxembourg	14,849,800
Fish, salted or cured	Newf., Canada, & U. S. & Possessions	Italy & Fr. W. Indies	5,079,000
Fish meal	Canada, Iceland, Norway, Angola	Denmark, Austria, & Bizone Germany	3,956,361
Oil, herring	Iceland	Bizone Germany	1,694,000
" , seal	Newfoundland	France	257,600
" , shark liver	Latin America except Argentine & Brazil	France	250,000
" , fish	U. S. & Possessions	Bizone & French Zone of Germany & Korea	846,000
" , technical fish	U. S.	Bizone Germany	100,000
" , whale (includes sperm oil)	Netherlands, Belgium, Norway & U. S.	Austria, Bizone & French Zone of Germany	7,056,150
" , whale and fish	U. S. & Possessions	Korea	162,000
" , sperm & polymerized fish	U. S. & Possessions	France	23,000
Vit. A (Commercial grade, for stock feed)	U. S.	Netherlands	567,000
Grand Total Authorized			34,840,911
^{1/} Unless otherwise indicated, the recipient country is the procuring agency, and the Government of the participating country or its authorized agents or importers do the purchasing.			

Marshall Plan; information of potential purchases to be made in the United States; names and addresses of European importers and the products they have purchased under the Marshall Plan; information regarding commodities which offer the greatest opportunities for sales in Western Europe; and finally, a directory will be compiled listing names and addresses of potential American exporters, by commodities. This directory will be for overseas distribution and will be available through ECA

overseas missions to European importers seeking additional American sources of supply. ECA emphasized that it is a financing agency and does not do any buying nor does it obtain orders for any business enterprise. Such orders must be sought by each company in regular commercial channels or through participating Governments' procurement agencies.

In its effort to aid the small independent enterprises, ECA has added to its procurement authorization forms a new provision calling the attention of Marshall Plan countries to the commodities and services offered by small American business firms.



Federal Purchases of Fishery Products

DEPARTMENT OF THE ARMY, August 1949: During August 1949, the Army Quartermaster Corps purchased 1,751,935 pounds (valued at \$506,464) of fresh and frozen fishery products for the U. S. Army, Navy, Marine Corps, and Air Force for military feeding (see table). Purchases during the month were 20 percent greater in quantity than in July 1949 and 5 percent more than in August 1948. However, the value of the August purchases this year was only 4 percent higher than in July 1949, and 9 percent less than in August 1948.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (August and January through August 1949 and 1948)							
Q U A N T I T Y				V A L U E			
A u g u s t		January-August		A u g u s t		January-August	
1949	1948	1949	1948	1949	1948	1949	1948
lbs.	lbs.	lbs.	lbs.	\$	\$	\$	\$
1,751,935	1,662,509	11,089,988	11,100,651	506,464	558,668	3,636,905	3,931,998

Purchases for the first eight months in 1949 were only .1 percent less in quantity, and 8 percent less in value, compared with the corresponding period a year ago.



Fishery Biology Notes

"ALBATROSS III" - CONTINUES CENSUS OF FISH POPULATION (Cruise 28): A census of the fish population was the chief purpose of Cruise 28 (September 6-16, 1949) of the North Atlantic Fishery Investigations' vessel, Albatross III. During the cruise, 35 half-hour tows were made at 32 stations in depths up to 120 fathoms. Hydrographic observations, consisting of water temperatures and bottom topography, were also collected.

Large haddock were found in commercial quantities on Fippennies and about 35 miles southeast of Cashes Ledge in more than 100 fathoms. Catches varying from 7 to 21 bushels of market-sized rosefish were taken in the vicinity of Fippennies, Jeffreys Banks, Cashes Ledge, Platts Bank, and Mt. Desert Rock.

A scientist from the Bingham Oceanographic Foundation at Yale University was aboard the vessel during this cruise. He collected large numbers of sponges, sea urchins, and other invertebrates common to the Gulf of Maine.

NEW FISHERIES RESEARCH VESSEL: A new Fish and Wildlife Service fishery research vessel, Sablefish, was launched at Seattle on August 31. This seiner-type vessel will be used by the Service's Branch of Fishery Biology for herring and pink salmon investigations in southeastern Alaska.

DR. VAN OOSTEN TO DEVOTE TIME TO RESEARCH: The direction of the Service's Great Lakes Fishery Investigations at Ann Arbor, Mich., has been taken over temporarily by Dr. Ralph Hile in order to permit Dr. John Van Oosten, chief of the Investigations since 1927, to devote his time exclusively to the fields of fishery research and writing, according to an October 13 announcement. However, Dr. Van Oosten will continue to assist the Service and other cooperating agencies in an advisory capacity in matters affecting the Great Lakes fisheries.

With the Service about to undertake an expanded program of investigations into the depletion of the fisheries of the Great Lakes due to the depredations of the sea lamprey, this will provide Dr. Van Oosten an opportunity to study and release much valuable data on the fisheries of that area for use as background for the new studies.

SARDINE SPAWNING AREA DISCOVERED OFF CENTRAL CALIFORNIA: Sardine larvae were collected August 14 and 15 at stations about 35 and 70 miles offshore, midway between San Francisco and Monterey by the Service's research vessel, Black Douglas, according to a report from the Chief of the South Pacific Fishery Investigations. These larvae were about an inch long and approximately two months old. This discovery indicates that sardine spawning took place off central California in June of this year. In June 1946 and May and June 1939 the Service collected sardine eggs and/or larvae north of Point Conception. The California Division of Fish and Game also collected them there in March and May 1931 and in May and April 1930.

An important sardine spawning area is known to exist south of Point Conception, off southern California. The importance of spawning grounds to the north of Point Conception is unknown at present. This is one of the questions to be answered by the cooperative sardine research program being conducted by the California Academy of Sciences, California Division of Fish and Game, Scripps Institution of Oceanography, and the Fish and Wildlife Service.

SERVICE STUDYING SPONGE DISEASE OFF FLORIDA: The sponge industry in waters off Florida and Cuba is threatened by a new disease which in the last few months has put an end to sponge fishing from Tarpon Springs to St. Marks, Florida, the Service reported October 3.

A study of the sponge disease by the Service has been under way in cooperation with the Florida State Supervisor of Conservation and the University of Miami Marine Laboratory. Boats making the survey are the FWS Pompano and the Athens—the latter boat and crew being donated by a sponge fisherman.

Commercial sponges, non-commercial sponges, and varieties of coral are killed by the disease, which was first noticed in December 1948. A similar disease in 1938-39 killed practically all sponges in waters deeper than 10 fathoms. At present, most of the remaining sponges—now hit by disease—lie within four fathoms.



Fishery Outlook for October-December

Sharp competition in the marketing of its products faces the U. S. fishing industry during the remainder of 1949, according to the October-December quarterly outlook report released by the Service on October 17.

Prospective large supplies of fishery products, augmented by increased imports and decreased exports, and ample quantities of other foods in the market (particularly meats) are given as the basis for the prediction.

Supplies of fish will remain plentiful throughout the last quarter of 1949, although fishing activities in most areas will decline with the winter season. Holdings of frozen fishery products are near record levels for this time of year and stocks of canned fishery products are in fair to good supply. In foreign trade, the reports shows that fishery exports from the United States have been small and imports large. The devaluation of foreign currencies may tend to increase this imbalance.



Fresh and Frozen Fish Report in Response to H. Res. No. 174 (81st Congress)

A report on fresh and frozen fish was completed and transmitted to Congress late in September by the Secretary of State, the Secretary of Commerce, and the Tariff Commission in compliance with the request contained in House Resolution 174, 81st. Congress, adopted June 20, 1949. This resolution requested these agencies to make an immediate study of the effect on the domestic fishing industry of increasing imports of fresh and frozen fish and to submit a report by September 15. The report was submitted to the House of Representatives by the Department of State on September 15, 1949. The Tariff Commission did not consider it appropriate to join in the conclusions and recommendations because of the possibility that the Commission will be called upon to make findings and recommendations with regard to this subject under Executive Order 10004 which provides for the administration of the Escape Clause in trade agreements.

Report deals with fishery products for human consumption (as distinguished from fish used for fish meal, oil, and miscellaneous nonfood purposes). It consists of four sections. Section A deals with a general discussion on the scope of the report; total production, exports, and imports; tariff status of fishery products; fisheries by regions; species of fish involved; prices, and a resume of the fishing industries in principal countries supplying United States imports of fresh and frozen fish. Section B is concerned with fresh and frozen fillets and the species of fish involved; production, imports, and exports; foreign production; United States import duties; consumption; factors influencing production and imports, together with Government assistance to fisheries enterprises in the United States, Canada and Newfoundland; and factors affecting domestic and foreign costs of fillets, including wage rates, prices paid for fish, and the price trend of fish for filleting in the United States; and a specific analysis of groundfish fillets. Section C contains a discussion of fresh or frozen fish (other than fillets), and includes general comment and tariff status of each of the following species: salmon, halibut, mackerel, swordfish, sturgeon, fresh-water fish and eels, smelts, sea herring, tuna, and fresh or frozen fish or other species. Section D contains the conclusions and recommendations, describing the general impact of foreign competition, and discussing the possible courses of action.

Conclusions: In considering the general impact of foreign competition upon the United States fishery industry, the report concludes: "It is clear however, from the foregoing data that the industry as a whole has, over the years, steadily grown and that it has been sustained by a vigorous demand for fish products on the part of the population of the United States...." Subject to certain qualifications, the report further concludes that "there is reason to believe that the United States market will continue to support expanding domestic production even should imports continue to increase. The domestic industry has been active; prices in general have been at profitable levels. Generally speaking, the industry is in a much better position than it was before the war, and the long-term upward demand trend for its products seems reasonably secure...."

With reference to costs, the report points out that "The United States filleting industry generally appears to pay higher wage rates and higher prices for its raw fish than its foreign competition. However, against the foreign filleters' advantages as regards wage rates and prices of raw fish, the United States industry also has certain advantages, such as its proximity to important centers of consumption...."

The more important courses of action suggested by Government and the industry to assure a continuing state of health and activity for the industry are discussed by the report. Referring to quantitative import restrictions, the report points out that "The United States, in conformity with its basic policy of encouraging the avoidance by the world in general of quantitative import restrictions, has joined with a great many other countries, through the General Agreement on Tariffs and Trade, in keeping these restrictions to the minimum....The only way in which this country could be freed of its obligation to refrain from placing quantitative restrictions on fish products would be through procedure under the escape clause in that agreement...."

"However, it may be pointed out that on the basis of the data which have been available for preparation of this report, it would not appear that the suspension of any obligations in the General Agreement is needed to protect the existing domestic fishing industry...."

"Aside from the fact that quantitative restrictions on imports do not appear to be needed to protect the domestic fishing industry their establishment might have an injurious effect upon the whole conduct of the United States policy of avoiding unnecessary barriers to the flow of trade...."

"But apart from these larger objectives the immediate interests of consumers and distributors also must be considered. Frozen groundfish fillets, for instance, are of special importance to consumers in the Midwest and other inland areas, who, in addition to purchasing large quantities of domestic fillets, have indicated an increasing desire for certain imported fillets...."

In regards to subsidization which might be employed to aid the fishing industry, the report calls attention to Article XVI of the General Agreement on Tariffs and Trade, which reads as follows:

"If any contracting party grants or maintains any subsidy, including any form of income or price support, which operates directly or indirectly to increase exports of any product from, or to reduce imports of any product into, its territory, it shall notify the CONTRACTING PARTIES in writing of the extent and nature of the subsidization, of the estimated effect of the subsidization on the quantity of the affected product or products imported

into or exported from its territory and of the circumstances making the subsidization necessary. In any case in which it is determined that serious prejudice to the interests of any other contracting party is caused or threatened by any such subsidization, the contracting party granting the subsidy shall, upon request, discuss with the other contracting party or parties concerned, or with the CONTRACTING PARTIES, the possibility of limiting the subsidization."

Report finds that "The facts brought out in this report would appear to suggest that a positive course of action directed toward expanding consumption and reducing domestic production costs would be the most appropriate method of meeting the industry's problem of competition...."

The only government aid which the report advocates is the possibility "that the fishing industry would receive direct benefit from any increase in activity in sponsoring aid to small business at large. The Congress perhaps could give important aid to the fishing industry through this program...."

Recommendations: The recommendations made by the report state: "In view of the foregoing analysis it would seem constructive for the Congress to provide funds for the appropriate governmental agencies to cooperate with and aid industry in developing and expanding programs for the further improvement of techniques and facilities for catching, storing, processing, transporting, and marketing of fish.

"If the Congress favors such action, a further study should be made to determine the specific programs to be undertaken and the funds needed to carry them out."



F.A.O. Proposes an International Commodity Clearing House

Creation of an International Commodity Clearing House has been proposed to the 58 member nations of the Food and Agriculture Organization, according to a September 21 news release from that agency.

Operation of ICCH is intended to permit surplus-producing countries to keep output of agricultural commodities at high levels without resort to restrictive measures, destruction of crops, or "dumping" devices.

On the other hand, it would enable importing countries now unable to buy as much food and other agricultural products as they need to take additional amounts, paying ICCH considerably reduced prices in the currency of the supplying country or the full price in their own currency. This currency would be redeemed and the accounts of exporting countries cleared through the general expansion of trade or return to currency convertibility which this and other measures would help to bring about.

The proposed ICCH would be a public corporation with a capital equivalent to \$5 billion contributed by member countries in their national currencies. It is proposed to set this up as an action arm of FAO, so that no new international organization would be necessary. It would be operated by a manager appointed by the FAO Director-General, assisted by a board of 15 commodity trade experts elected by the Conference of FAO.

Although fishery products were not specifically mentioned, it is conceivable that they also could be included in this program.



Pacific Oceanic Fishery Investigations

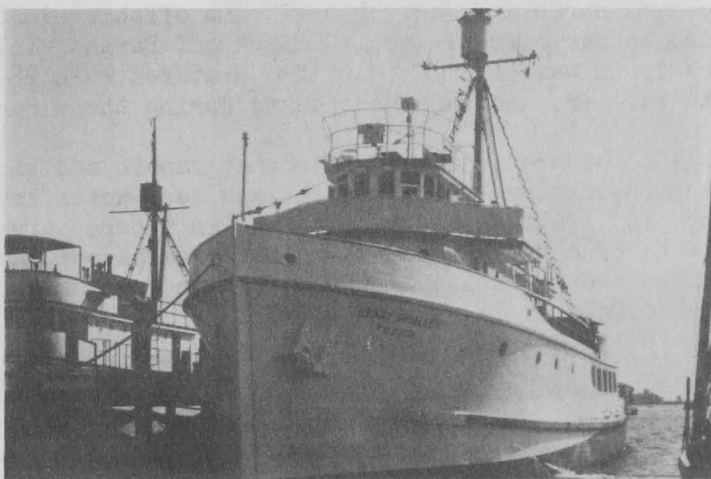
HAWAIIAN TUNA FISHERY: Tuna fishing in Hawaii during July was variable but the fishery for skipjack was very profitable, according to the August report of the Pacific Oceanic Fishery Investigations. Since the skipjack catches were good and regular, they made possible a continuous capacity operation of the local cannery for 40 to 50 hours each week. Toward the end of July the size of the skipjack in the catch had declined to an estimated 15-pound average from the 20 to 25-pounds of the past few months.

Long-line fishing for the big-eyed and yellowfin tunas was poor during early August, but improved toward the end of the month to the point where a landing was comprised of 20 to 25 large tunas. The big-eyed tuna in the catch have passed the spawning season and are now very plump and oily in comparison to their condition during the late spring months.

Bait has continued to be a problem in the tuna fishery in this area. Although the skipjack fleet has found bait available for the most part, the long-line fishermen have been beset with difficulties. Bait has been hard to catch and expensive on the market. For a part of the month, the opelu used for bait cost the fishermen from 50 to 80 cents a pound.

JAPANESE BAIT NET TESTED: Members of the POFI staff and representatives of the Territorial Fish and Game Commission, aboard the latter's research vessel, Makua, made a 3-day trip to the Kauai Island to test a Japanese bait net. They found the net to be superior for making collections under a light in a rough sea and suitable also for baiting operations in sheltered waters.

STATUS OF VESSELS: The motor vessel US FWS Henry O'Malley left San Diego on October 6 for Honolulu where it will undertake explorations for tuna. This vessel is the first of three fishery research and exploratory fishing vessels to be completed for the Service's Pacific Oceanic Fishery Investigations. A former Navy vessel of the YP 600 class, the Henry O'Malley's conversion was completed on September 27. This vessel will be primarily concerned with experimental fishing for tuna on a commercial scale in the tropical and subtropical seas between Hawaii and the Palaus, and after arrival in Honolulu will probably make a short shakedown cruise of about two weeks in order to test all fishing gear prior to an extended trip.



POFI VESSEL, HENRY O'MALLEY, DOCKED AT SAN DIEGO PRIOR TO SAILING FOR HONOLULU.

Conversion of a second vessel, also of the YP 600 class, will be completed in Tacoma, Washington, in November. This vessel, the US FWS Hugh M. Smith, will sail for Honolulu and will be used primarily for biological and oceanographic research.

The US FWS John R. Manning, which is being constructed as a purse seiner, will join the fleet of vessels being operated by the Service at Honolulu, and will sail sometime early in 1950. This vessel will have four brine wells instead of two as originally planned.



Northwest Pacific Exploratory Fishery Program

The Service began an exploratory albacore survey on August 8 for the purposes of gaining information concerning the abundance, range, and commercial possibilities of this fishery in waters adjacent to Alaska. The US FWS Oregon, a 100' steel tuna vessel, was employed in the work. Equipped for surface and deep trolling, chumming with live bait, and flag-line fishing, the vessel also carried scientific equipment to determine water temperatures and depths, and to make plankton tows.

The vessel devoted the first week to working in waters off the coast of Washington, for the purpose of testing its gear and equipment before starting north. During this time, a good showing of tuna was found 50 miles WSW. of Cape Flattery. This news and other relevant information was broadcast to the fishing fleet, and several vessels made use of the information. During the trip, bait was a major problem, being difficult to find.

The vessel worked up the British Columbia coast and into Alaska coastal waters. Fish were located off Cape Cook and Cape Scott, but were moving very fast. The most northerly point at which tuna were caught was the Walker Seamount area, latitude $55^{\circ}11'$ N. and longitude $140^{\circ}20'$ W. about 300 miles off Baranof Island. Further fishing activities offshore as far north as Sitka were conducted but no tuna were caught.

Running back towards the south, scattered fish were taken off Dixon Entrance and the northern Queen Charlotte Islands early in September. Then the vessel again proceeded north and made several runs offshore in the Alaska area. These runs extended as far offshore as 150 miles off Baranof Island. The maximum water temperature found was 54.5° F., and temperatures were 2° - 2.5° F. colder than recorded a month earlier. No tuna were taken during these runs.

A considerable amount of oceanographic and biological information was obtained during the cruise. Both surface and deep-water temperatures were taken at frequent intervals. This should be of value in future surveys. Examination of the stomach contents of a representative number of albacore caught furnished information concerning feeding habits of these fish in various areas. The vessel returned to Seattle on October 11.



Proposed Split Halibut-Fishing Season

As a means of lengthening the season and increasing the use of the available supply of halibut, the International Fisheries Commission has advanced proposals for a split fishing season in the Northwest halibut fishery. For the information of those interested in the halibut fishery, the Commission has issued a "Memorandum on the Proposed Split Halibut-Fishing Season." According to its memorandum:

The International Fisheries Commission began regulating the Pacific Fishery in 1932. Its 18 years of management has caused great improvement. There has been an almost continuous increase in the stock of halibut on the grounds. As the stock has been carefully built up, the Commission has from time to time allowed larger annual catches. This is now the most prosperous halibut fishery in the world. . . .

The Effects of Regulation Upon the Halibut Fishery: The abundance of halibut on the Coast as a whole has increased about 150 percent and total catch during the past four years has averaged over 56,000,000 pounds annually, an increase of 13,000,000 pounds over 1931. This additional poundage, together with the associated vitamin-bearing livers and viscera, adds over \$3,000,000 to the fleets' yearly earnings. In spite of the larger catches permitted each year, the increased abundance has resulted in a 35 percent reduction in the amount of fishing effort required to secure the catch.

These changes in the fishery have directly and indirectly caused pronounced changes in the size and character of the halibut fishing fleet, in the rate at which halibut are landed, and in the length of the fishing season.

The fleet has increased in size not only because of the

larger stocks of halibut but also on account of the general increase in number of vessels in other fisheries capable of temporarily converting to the short but profitable halibut fishing season. This, for the most part, occurs during the time when other fisheries are inactive. In 1931, there were 326 vessels engaged in halibut fishing compared to 744 vessels in 1948. In addition, there has been a fourfold increase in the one-man or two-man boats fishing for halibut prior to engaging in other fisheries.

Landings are now at the rate of 30,000,000 pounds monthly when Area 2 and 3 are open as compared to 6,000,000 pounds monthly during the years prior to regulation.

The length of the fishing season has declined from 245 days in Area 2 in 1931, to 34 days in 1949. In Area 3, the decline has been from 245 days to 73 days in the same period. The present trend indicates that the season in Area 2 may soon be reduced to 25 days and in Area 3 to under 60 days. . .

Conservation Advantage of a Longer Season: There is evidence that the present short fishing season in both Area 2 and 3 is seriously interfering with the attainment of the conservation objectives of the present treaty, namely, to secure and maintain a maximum yield from each stock of halibut. . . .



HALIBUT SCHOONER IN ALASKA INSIDE PASSAGE EN ROUTE TO NORTH PACIFIC BANKS.



MAKING UP A SKATE OF GEAR ABOARD A WEST COAST HALIBUT SCHOONER ON THE WAY TO THE FISHING GROUNDS.

This was pointed out in a report to the United States and Canadian Governments in 1946. The memorandum goes on to state that:

A conservative estimate, based on the 45 percent increase in the annual catches which are being taken without injury to the supply on the always intensively-fished Cape Scott and Goose Island and Upper Hecate Strait grounds, indicates that perhaps as much as 2,000,000 pounds are being lost each year in Lower Hecate Strait and perhaps even more in the outside waters of Southeastern Alaska. It appears that a reasonable extension of the fishing season would bring about a redistribution of fishing effort and avoid a considerable portion of the above losses. Furthermore, an additional 1,000,000 pounds would be gained from growth in weight of the fish by extending the present one-month Area 2 season to to three months.

The Fleet's Efforts to Lengthen the Season: Although the fleets have been interested in the broad conservation aspects of a short season, they have naturally been more actively concerned about the disturbing effect of a short concentrated season on their market. Between 1933 and 1942, with varying success, the fleets controlled the rate of landing of the permitted catch limits, by what became known as the Voluntary Curtailment Program. This program, consisting of trip limits and tie-up periods between trips, did not reduce production but attempted to maintain a season of reasonable length to allow a more orderly marketing of the catches which the Commission's regulations allowed.

The Commission was sympathetic and assisted the fleets with factual information, wherever possible, but did not itself take part in the program. On several occasions between 1933 and 1938, the fleets petitioned the Commission to secure powers that would allow it to provide legal support for their voluntary program. . . .

Commission's Proposals for Lengthening the Fishing Season: The interest of the Commission with respect to maintaining a season of reasonable length underwent gradual change with the subsequent shortening of the seasons, which brought the problem of full utilization of the stocks to the fore. By the end of 1945, in which the Area 2 and Area 3 seasons were only 1½ and 5 months long, respectively, extension of the season had become biologically important. The fact that extension of the season would help the fleet economically was only incidental by that time. . . .

The 1946 Report, which was supported by the industry, recommended treaty changes that would permit lengthening the season by the following two methods:

- "(1) Reducing the rate of fishing by a program consisting primarily of tie-ups between trips and secondarily of limitation of the catch per trip, applied to boats individually."

This envisaged a program substantially the same as that successfully followed earlier by the fleets for the economic purpose of securing a more orderly marketing of their catches.

- "(2) Reducing the rate of fishing by splitting the fishing season by tie-up periods, simultaneously applied to all boats."

This procedure contemplated the division of the fishing season in an area or areas into two or more fishing periods with intervening closed periods and possibly the assignment of a portion of the annual catch limit to each open period. This split-season method had been examined several times during the preceding 12 years and was considered to possess some impractical administrative and enforcement features. The halibut fleets agreed with the Commission in this opinion but felt that it should be included in the recommendations, inasmuch as conditions might change and render it practicable.

No action having been taken by the Governments on the recommended treaty changes, and conditions having grown worse in respect to the length of season, another proposal for lengthening the fishing season was made by the Conference Board on January 12, 1949, as follows:

"That vessels of all sizes be allowed to make only one halibut trip per month. . . ."

This proposal implied that each boat would make its monthly trip at a time of its own choosing. It was similar to the first of the 1946 recommendations in that it provided for tie-ups between trips, individually applied. It differed from it in abandoning the idea of trip limits. The proposal came from a representative from Alaska.

Although there seemed to be merit to this suggestion, it was impossible for the Commission to carry it out under the authority of the present treaty. Consideration of the one-trip-per-month proposal led to a discussion between the fleet representatives and the Commission of the "split season" method as an alternative. It was decided that the conservation benefits of a split season might be so important that they would outweigh its shortcomings.

It was believed that the present treaty might provide the necessary authority for "splitting the season". The proposed change was felt to be of importance that the Commission wished to have the benefit of the opinion of the fleets concerning it before it would act. Accordingly, the representatives present agreed to take the matter up with their various fleets and submit the results to the Commission through the Fishing Vessel Owners' Association in Seattle.

The Ketchikan, Prince Rupert, Vancouver, and Seattle halibut fleet owners and fishermen were in favor of the split-season proposed, while Juneau halibut fleet owners and fishermen, and Petersburg owners were opposed. No reply was received from the Petersburg halibut fishermen.

In view of the seriousness of the matter, the differences of opinion and the proximity of the opening of the fishing season, the Commission decided to postpone action on the split season proposal during the 1949 season. This would give it an opportunity to secure the views of all interested persons before a decision was made.

However, in view of the above, the International Fisheries Commission announced pub-



DRESSED HALIBUT ARE STORED IN ICE IN THE SCHOONER'S HOLD.

lic hearings at various ports on the West Coast during the latter part of September. The main purpose of the hearings was to secure opinions regarding proposals for a split fishing season in the halibut fishery, as a means of lengthening the season and increasing the use of the available supply of halibut.



School Lunch Program, 1949-50

Allocation of funds to the States and Territories for the operation of the 1949-50 National School Lunch Program announced August 2 by the U. S. Department of Agriculture indicates that the program is assuming an increasingly important role. Of the \$83,500,000 appropriated by Congress for the 1949-50 fiscal year (\$75,000,000 appropriated the previous fiscal year), a total of \$64,625,000 has been apportioned to the 48 States, the District of Columbia, and to the Territories of Hawaii, Puerto Rico, Alaska, and the Virgin Islands. Add to this the contributions of the individual States, the revenues obtained through the sales of many of the lunches, and the donations



from other sources and the ultimate amount involved will approximate \$200,000,000 for the coming year. More than 1.1 billion school lunches were served during the last fiscal year to approximately one-fourth of the Nation's school children.

Funds allocated to the States are used to reimburse participating schools for a part of local purchases of food for school lunches. These purchases, in addition to providing nutritious lunches for local school children, serve to enlarge the market for locally-produced foods. The funds are apportioned on the basis of a formula which takes into account the number of children of school age and the per capita income of each State. The law requires that Federal funds accepted must be matched equally by funds from sources within the States, except where the State's per capita income is lower than the average for the United States.

The portion of the appropriation not allocated to States and Territories, aside from funds needed for administrative expenses, is available to the Department of Agriculture for the purchase and distribution of specific foods to schools participating in the program, but fishery products are not included in this phase of the program. For 1949-50, \$17,250,000 has been earmarked for purchases of this type.

The Fish and Wildlife Service is stimulating the use of fish and shellfish through

State	Total	State agency	With-held for private schools
Alabama.....	\$2,290,495	\$2,239,991	\$50,504
Arizona.....	350,947	333,369	17,578
Arkansas.....	1,785,838	1,754,925	30,913
California.....	2,603,791	2,603,791	-----
Colorado.....	424,360	387,250	37,110
Connecticut.....	511,428	511,428	-----
Delaware.....	86,278	72,942	13,336
District of Columbia.....	181,136	181,136	-----
Florida.....	1,086,485	1,056,906	29,579
Georgia.....	2,315,262	2,315,262	-----
Idaho.....	245,728	238,376	7,352
Illinois.....	2,339,160	2,339,160	-----
Indiana.....	1,507,348	1,507,348	-----
Iowa.....	1,163,762	1,050,714	113,048
Kansas.....	725,089	725,089	-----
Kentucky.....	2,100,314	2,100,314	-----
Louisiana.....	1,745,553	1,745,553	-----
Maine.....	424,895	353,903	70,992
Maryland.....	695,856	583,769	112,087
Massachusetts.....	1,440,327	1,121,250	319,077
Michigan.....	2,220,678	1,911,909	308,769
Minnesota.....	1,239,294	1,071,192	168,102
Mississippi.....	2,239,594	2,239,594	-----
Missouri.....	1,605,852	1,605,852	-----
Montana.....	180,806	166,812	13,994
Nebraska.....	534,630	481,553	53,077
Nevada.....	34,414	33,823	591
New Hampshire.....	223,104	223,104	-----
New Jersey.....	1,263,018	1,037,170	225,848
New Mexico.....	373,279	373,279	-----
New York.....	3,395,902	3,395,902	-----
North Carolina.....	2,760,998	2,760,998	-----
North Dakota.....	217,619	200,056	17,563
Ohio.....	2,576,365	2,239,314	337,051
Oklahoma.....	1,461,547	1,461,547	-----
Oregon.....	570,728	570,728	-----
Pennsylvania.....	3,741,015	3,102,570	638,445
Rhode Island.....	215,078	215,078	-----
South Carolina.....	1,778,427	1,757,206	19,221
South Dakota.....	269,017	251,162	17,855
Tennessee.....	2,070,789	2,022,034	48,755
Texas.....	3,612,744	3,612,744	-----
Utah.....	337,983	333,761	4,222
Vermont.....	167,202	167,202	-----
Virginia.....	1,613,536	1,568,681	44,855
Washington.....	818,033	772,265	45,768
West Virginia.....	\$1,215,067	\$1,189,520	\$25,547
Wisconsin.....	1,261,309	1,001,982	259,327
Wyoming.....	99,920	99,920	-----
Alaska.....	11,684	11,684	-----
Hawaii.....	89,972	72,746	17,226
Puerto Rico.....	2,358,953	2,358,953	-----
Virgin Islands.....	44,391	44,391	-----
Total.....	64,625,000	61,577,208	3,047,792

fish cookery demonstrations and procurement assistance by fishery marketing specialists. Dealers in fishery products should contact local school lunch agencies in their area and attempt to sell these outlets quality fishery products.



Scientific Conference On Conservation And Utilization Of Resources^{1/}

About 400 scientists and delegates (200 United States experts and 200 delegates from other Member Nations of the United Nations) from 41 different countries attended the United Nations Scientific Conference on the Conservation and Utilization of Resources (UNSCCOUR) authorized by the Economic and Social Council and held at Interim Headquarters of the United Nations at Lake Success, New York, from August 17 to September 6, 1949. The Conference was devoted to an exchange of ideas and experiences on techniques of resource conservation and utilization, their economic costs and benefits and their interrelations. Included among the six general subjects discussed was wildlife, fish and marine resources. The Conference had no policy-making responsibilities and it did not bind governments or formulate recommendations to them.



Discussions at the UNSCCOUR included ways and means of producing and marketing fish to feed populations of the world; causes for the material fluctuation in the abundance of marine fish; effects of commercial fishing upon fish resources of the ocean; methods of exploring and developing new fishing grounds; practical economics of marine fish from the standpoint of selection of craft and gear, type of catches, and marketing; augmenting of the food supply through pond culture of warm-water fish; and management of fish life in the lakes and streams of the world.

The discussions on the general subject of wildlife, fish and marine resources included the following general groupings for fish and marine resources:

1. Changes in Abundance of Fish Populations:

- (a) The effects of natural conditions. (Natural fluctuations in the abundance of marine fishes and their probable causes such as poor survival of young, unfavorable hydrological conditions, food supply, population pressures, excessive natural mortalities.)
- (b) The effects of fishing. (Reaction of fish stocks to fishing; evidences of overfishing; species most susceptible to overfishing; the optimum catch.)

2. Developing Fishery Resources:

- (a) Latent fishery resources and means for their development. (Location of undeveloped fisheries, methods of exploration and development; evidence of the existence of oceanic stocks; potential contribution to world food supply; international cooperation in exploitation.)
- (b) Propagation and transplantation of marine fish. (Possibilities of hatching, stocking and transplanting; methods employed.)

3. Fisheries Statistics:

- (a) Statistics on economic features. (Craft and gear used; catches; price, cost of production; marketing; development of fisheries; organization of industry; domestic and foreign trade.)

- (b) Biological statistics. (Resource evaluation; catch per unit of effort; measurements of fish at markets; statistical treatment of biological data.)

4. Management and Cultivation of Fresh Water Fish:

- (a) Pond culture of warm-water fishes. (Role of pond culture in food production, pond management; selection of species, pond fertilization, stocking, cropping; potential possibilities of pond culture as an additional source of food.)
- (b) Management of cold-water fish resources. (Principles and practices of hatching, stocking and management in streams, lakes, and artificial ponds; carrying capacity of waters; population balance; introduction of exotic species; effects of various rates of cropping on production; regulation of fishing.)

5. Technological Development in Fisheries:

Recent advances in methods of handling, distribution, preservation and processing of fish; new products and byproducts. Also notes on the factory ship, echo ranging and echo sounding and serial detection of fish, navigation aids, etc.

6. Research in the Conservation and Utilization of Marine Resources:

^{1/}See Commercial Fisheries Review, April 1949, pp. 30-2.

(a) Research in fishery conservation. (Techniques used in studying fisheries; the integration of hydrological, biological, and other studies in a well-rounded marine fisheries research program.)

(b) Utilization of algae. (Location and composition of algae of actual or potential value; quantitative survey methods and findings; growing, harvesting and processing techniques and equipment; food, industrial and agricultural utilization of algae and algal chemicals; seaweed conservation.)

The following papers were presented at the Conference and these will be published as part of the printed proceedings which will be available in the near future.

Changes in the Abundance of Fish Populations, by Gunnar Rollesen, Director, Biological Station, Bergen, Norway. (Introductory Paper.) Abstract: The variable nature of Norway's seasonal fishing for cod and herring is outlined. Reasons are given why the great fluctuations in the catches hitherto must be considered caused by other activity than that of man. Different types of fluctuations occurring are described and analyzed. 1(a)/1

Fluctuations in the Abundance of Herring on the West Coast of Vancouver Island, British Columbia, by Albert L. Tester, Fisheries Research Board of Canada and University of Hawaii, Honolulu, T. H. (Experience Paper.) 1(a)/2

The Present World Problem of Sea Fisheries, by Jean Le Gall, Agrege, Director of the Office of Scientific et Technique des Peches Maritimes, France. (Experience Paper.) 1(a)/3

Fluctuations in Fish Populations Owing to Climatic Changes, by A. Vedel Taning, D. Sc., Charlottenlund, Denmark. (Experience Paper.) 1(a)/4

The Enclosing of the Zuyder Zee and Its Effect on Fisheries, by Dr. B. Havinga, Director, Government Institute for Fisheries Investigations, Amsterdam, The Netherlands. (Experience Paper.) 1(a)

Overfishing, by Dr. Michael Graham, Lowestoft Research Laboratory of the Ministry of Agriculture and Fisheries, Norfolk, England. (Introductory Paper.) 1(b)/1

The Effects of Fishing on Norwegian Fresh-water and Anadromous Fishes, by Sven Somme, Government Inspector of Salmon and Fresh-water Fisheries, Oslo, Norway. (Experience Paper.) 1(b)/2

Latent Fishery Resources and Means for Their Development, by Dr. Harold Thompson, M. A., D. Sc., Chief, Division of Fisheries, C. S. I. R., Marine Biological Laboratory, Cronulla, New South Wales, Australia. (Introductory Paper.) 2(a)/1

Latent Fishery Resources and Means for Their Development, by Dr. Cecil Von Bonde, Director of Fisheries for the Government of the Union of South Africa and Member of the Standing Advisory Committee on Fisheries of FAO, Capetown, Union of South Africa. (Experience Paper.) 2(a)/2

Latent Fishery Resources and Means for Their Development, by Prof. Dr. E. de Vries and Dr. C. J. Bottemanne, The Netherlands. (Experience Paper.) 2(a)/3

The Exploitation of the Egyptian Elasmobranchs, by Dr. Ibrahim Abou Samra, Director of Fouad Institute of Hydrobiology and Fisheries, Alexandria, Egypt. (Experience Paper.) 2(a)/4

The Shellfish Industry in Holland, by Dr. P. Korrings, Government Institute for Fishery Investigations, Bergen op Zoom, The Netherlands. (Experience Paper.) 2(a)/5

The Development of the Fishery Resources in Chile, by Milton J. Lobell, Santiago, Chile. (Experience Paper.) 2(a)/6

Propagation and Transplantation of Marine Fish, by H. Blegvad, Ph. D., Director, Danish Biological Station, Secretary-General, International Council for the Exploration of the Sea, Charlottenlund, Denmark. (Introductory Paper.) 2(b)/1

Propagation and Transplantation of Marine Fish in Europe, by Dr. Alf Dannevig, The Fløddevig Sea-fish Hatchery, Arendal, Norway. (Experience Paper.) 2(b)/2

Statistics on Economic Features of the Fisheries, by Stewart Bates, Deputy Minister of Fisheries, Ottawa, Canada. (Introductory Paper.) 3(a)/1

Economic Statistics on Marine Fisheries, by M. Louis, Principal Administrator of the Inscription Maritime, Marine Fisheries Department, Merchant Marine, France. (Experience Paper.) 3(a)/2

Fisheries Statistics - Data Submitted by the Netherlands Government. 3(a)/4

Statistics on Economic Features of the Fisheries, by G. M. Gerhardsen, Chief Economist, Fisheries Division, Food and Agriculture Organization of the United Nations, Washington, D. C., U. S. A. (Experience Paper.) 3(a)/4

Statistics on Economic Features of the Fisheries of the United States, by Edward A. Power, Chief, Statistical Section, Branch of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C. (Experience Paper.) Abstract: The collection of basic employment and production statistics in the United States is considered a State rather than a Federal function. However, only about one-half of the States supporting important commercial fisheries collect detailed fishery statistics.

Establishment of statistical systems by slow degrees is recommended. Once a statistical system is established, it is essential that use be made of the figures, or the quality of the data will decrease.

Experience appears to indicate that, in the United States, it is more profitable to confine the limited Federal collection of data to areas where the maximum cooperation with other agencies is obtained.

Special manufactured products surveys can be used to obtain some knowledge of catch trends.

The collection and publication of daily fishery production, price and movement statistics is one of the most valuable services provided the fishing industry. Despite the improvement in the collection and dissemination of fishery data in the United States, economists are still handicapped by the lack of essential data.

The River and Inland Fishery, the Fish Stock and Fish Recruiing in the Netherlands, by C. D. C. Hos, The Netherlands. (Experience Paper.) 4(a)/8

Management and Cultivation of Fresh Water Fish: Pond Culture of Warm Water Fishes, by Sunder Lal Hora, D. Sc., F. R. S. E., F. Z. S., F. R. A. S. E., F. N. I., Director, Zoological Survey of India, Indian Museum, Calcutta, India. (Introductory Paper.) 4(a)/1

Rice-Paddy Carp Culture in Japan, by Yoshio Hiyama, Fisheries Institute, Faculty of Agriculture, Tokyo University, Tokyo, Japan. (Experience Paper.) 4(a)/2

Pond Culture of Warm Water Fishes, by S. Y. Lin, Fisheries Research Department, Hong Kong, China. (Experience Paper.) 4(a)/4

Pond Culture of Warm-Water Fishes in Indonesia, by Ir. A. E. Hofstede, Head of the Sub-section Inland Fisheries, Department of Agriculture and Fisheries, Batavia, Indonesia. (Experience Paper.) 4(a)/5

Pond Culture of Warm-Water Fishes as Related to Soil Conservation, by O. Lloyd Meehan, Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C. (Experience Paper.) 4(a)/6

Pond Culture of Warm Water Fishes (With Special Reference to Bangos or Milkfish Cultivation Under Philippine Conditions), by Hermario R. Rabanal, Bureau of Fisheries, Department of Agriculture and Natural Resources, Manila, Philippines. (Experience Paper.) 4(a)/7

Management and Cultivation of Fresh-Water Fish - Principles and Practices with Special Reference to Conditions in New Zealand, by A. E. Hafford, formerly Chief Inspector of Fisheries and Director of Fishery Research to the Marine Department, New Zealand. (Introductory Paper.) 4(b)/1

The Management of Cold-Water Fish Resources in South Africa, by D. Hey, D. Sc., Department of Inland Fisheries, Cape Provincial Administration, Stellenbosch, South Africa. (Experience Paper.) 4(b)/2

Recent Advances in Methods of Handling, Preservation, Processing and Distribution of Fish. Developments in Utilization, New Products and By-Products, by Olav Motevarp, Director, Norwegian Fisheries, Official Research Laboratory, Bergen, Norway. (Introductory Paper.) 5/1

Recent Advances in the Handling and Processing of Fish, by G. A. Reay, B. Sc., Ph. D., F. R. I. C., Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland. (Experience Paper.) 5/2

Recent Advances in Various Technological Aspects of Handling Fish and Fish Products, by Dr. H. L. A. Farr, Acting Director, Fisheries Research Board of Canada, Fisheries Experimental Station, Vancouver, B. C., Canada. (Experience Paper.) 5/3

Technological Advances in Fishing Methods, by Dr. J. L. Hart, Pacific Biological Station, Nanaimo, B. C., Canada. (Experience Paper.) Abstract: High speed diesel engines, radio telephone, and echo-sounding are of established general usefulness in many fisheries. Range finders and automatic pilots have proved of definite value in particular fisheries. Aerial detection of fish and the use of echo ranging have been the subject of encouraging experiment and may have unrealized potentialities in increasing fishing efficiency. 5/4

Saury Lift-Net Fishing with Light, by Shigene Takayama, Central Fisheries Station of Japan, Tokyo. (Experience Paper.) 5/5

Technological Development in Fisheries with Special Reference to the Factory Ship in the United States, by A. W. Anderson, Chief, Branch of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington, D. C. (Experience Paper.) Abstract: Mobile vessels processing their own catches or the catches of an accompanying fleet of fishing craft have operated in the United States fisheries since early in the 16th Century beginning with salting cod and progressing through whaling, salmon canning; freezing tuna, halibut and salmon; and reducing pilchards, herring and waste to meal and oil.

Recent factory ship developments have been varied. The Atlantic Coast fisheries are represented only by a proposed 175-foot vessel equipped to trawl, fillet and freeze its catch, and reduce the waste. Gulf of Mexico fishery interests have built or adapted a number of shrimp trawlers to catch, package and freeze shrimp but current operations appear unprofitable.

Western Alaska fisheries have attracted an increasing number of vessels equipped to dress, freeze and transport salmon. The king crab resources also are being fished by additional craft specially built or converted to trawl for king crab, and package and freeze crab meat.

The operations of the Pacific Explorer, 8800-ton factory ship, in serving as a mothership and freezer for tuna purse seiners resulted in a series of smaller but more adaptable tuna freezing and transporting vessels for use in waters off Central and South America. The Pacific Explorer operation in Western Alaska produced a large pack of canned king crab but the advantages of a factory ship of its type have yet to be compared in detail with other types of operation.

Filleting is not being practised on fishing craft but tests indicate that freezing round fish at sea, thawing and filleting them on shore, and packaging and refreezing the fillets may have many advantages. 5/6

Recent Advances in Methods of Handling, Preservation, Processing, and Distribution of Fish. Developments in Utilization, New Products and By-Products, by Frode Bransones, Director of the Technological Laboratory of the Ministry of Fisheries, Denmark. (Experience Paper.) 5/9

The French Sea Fishing By-Products Industry, by Prof. J. Perard, Chairman of the Syndicat General des Industries de traitement des sous-produits de la peche maritime, Paris, France. (Experience Paper.) 5/7

Methods of Detecting Fish by Echo Ranging and Echo Sounding, by Lieutenant de vaisseau J. Renou, Head of the "Press-Information" Service of the French Navy. (Experience Paper.) Abstract: Numerous experiments have definitely established that an echo-ranging device, whatever it may be, can detect any shoal of fish whatsoever at distances varying from 200 to 2,000 meters, provided that the conditions of propagation in the water are not extremely unfavorable; with the indications furnished by an echo-ranging device, a fishing boat equipped with that apparatus can be guided directly to the shoal, the depth of which is then revealed by the echo-sounding instrument; taking into account the ecological factors, the detected fish can be identified in most cases by studying the echo-ranging and echo-sounding recordings. Echo-ranging can therefore be an effective aid to fishing. Aerial detection can also render valuable assistance, though in exceptional cases only, either when the water is transparent enough to allow the fish to be seen at a depth of several meters or when the shoal of fish comes to the surface to disport itself or to escape. The experiments, methods of investigation, results obtained, practical conclusions and future prospects are summarized in this paper. 5/8

Changes in the North Sea Stocks of Fish, by Michael Graham, Lowestoft Research Laboratory of the Ministry of Agriculture and Fisheries, Suffolk, England. (Experience Paper.) 6(a)/2

Research on Use and Increase of Fish Stocks, by Dr. A. G. Huntsman, Editor of Publications and Consulting Director, University of Toronto, Toronto, Ontario, Canada. (Experience Paper.) 6(a)/3

Research in Fishery Conservation (Techniques Used in Studying Fisheries; The Interaction of Hydrological and Biological and Other Studies in a Well-Rounded Marine Fisheries Research Programme in India), by H. Srinivasa Rao, Chief Research Officer, Central Marine Fisheries Research Station, Madras, India. (Experience Paper.) 6(a)/4

The Utilization of Marine Algae, by Major Philip Jackson, M. Mech. E., M. Chemist, E., Deputy Director of the Scottish Seaweed Research Association, Midlothian, Scotland. (Experience Paper.) 6(b)/2

Utilization of Algae, by Emil Oy, Chemical Engineer, Stavanger, Norway. (Experience Paper.) 6(b)/3

Marine Algae, by Mr. Schang, Vice-President of the National Union of Iodine Manufacturers, Paris, France. (Experience Paper.) 6(b)/4

Sea Lampreys Continue to Increase in Great Lakes

Destruction of the Great Lakes fishing industry (the nation's richest source of fresh water fish for commerce and recreation) is threatened unless an effective control of the sea lamprey is developed within the next few years, according to the Director of the Fish and Wildlife Service.

In a report to Secretary of the Interior, the Director said that the lamprey is continuing to increase at an alarming rate, and already Lake Huron trout, hardest hit by the attack, has practically disappeared from the commercial catch. The total United States and Canadian commercial production of fish from the Great Lakes is around 100 million pounds annually. More than 5,000 U. S. fishermen and 2,000 boats are normally engaged in the industry.

The sea lamprey is an eel-shaped parasite with a suction-cup mouth, which sucks the blood of lake fishes, leaving them either dead or so badly scarred that it is almost impossible for commercial fishermen to dispose of them.

The sea lamprey problem was first brought before Congress in a hearing held in Washington in June 1946. Concerned over the threat to the \$12 million a year Great Lakes fishing industry, Congress passed Public Law 672 to engage in a program for the control of the lamprey, in conjunction with bordering States and other cooperators.

A Great Lakes Sea Lamprey Committee was formed, consisting of representatives from Wisconsin, Minnesota, Pennsylvania, Indiana, Illinois, Ohio, New York, the Province of Ontario, and the U. S. Fish and Wildlife Service. This international committee drew up a research program and field investigations were started.

From 1895 to 1935 lake trout production was quite steady in the United States waters of Lake Huron, averaging 1,720,000 pounds per year. From 1936 to 1939 the yield dropped to 1,345,000 pounds. In 1940 the take fell below 1,000,000 pounds and continued to fall in each succeeding year until it reached a new record low in 1948 of less than 5,000 pounds. A similar fate befell lake trout in the Canadian waters of Huron. No known factor other than sea lamprey depredations can account for this complete collapse of this fishery.

Lake Michigan trout is facing the same situation. From 1879 to 1945 the average annual take was somewhat over 6 million pounds. In 1946 it dropped to less than 4 million, in 1947 to less than 2½ million, and in 1948 to a little more than 1 million pounds, or one-sixth of the normal catch.

In Lake Superior the trout yield has not yet been noticeably affected by the lamprey but biologists predict that unless the parasite can be controlled, Superior trout will face extermination in a few years.

Now that the lake trout is so reduced in abundance, the sea lamprey is beginning to attack other species of fish, such as the whitefish, walleyes, herring, chubs, black bass, suckers, perch, bullheads, and catfish. This shifting of hosts by the parasite is unfortunate, say Service biologists, for not only do the sea lampreys divert their attacks to other species but fishermen must likewise change their fishing habits. In Lake Michigan, gill-net fishermen who formerly set nets for trout must now fish almost entirely for chubs and whitefish. These diverted attacks by both sea lampreys and fishermen place a heavy drain on all of the more valuable Great Lakes species of fish and threaten the existence of the entire industry.

So far no satisfactory solution has yet been found to the problem of control. Weirs and traps were found to be effective in certain streams, but such methods are expensive, are slow in exterminating a run, and are generally not applicable in many of the streams where spawning lampreys enter. At the present it appears that a combination of methods must be employed to eradicate or control the pest in most streams, and efforts must be concentrated on major runs. Certain fundamental questions have already been answered by research men but others must await further investigations.

During the 1949 season the spawning run of lampreys trapped by a two-way weir on the Ocqueoc River in Northern Michigan amounted to nearly 25,000 on July 18, when the run was largely completed. This is twice the 1948 estimate and two and one-half times the 1947 estimate.

The Ocqueoc weir was constructed by the Service in 1947 to trap adult lampreys on their upstream spawning migration and young lampreys on their way to Lake Huron to begin the parasitic phase of their life. It is operated by personnel of the Michigan Department of Conservation.

Evidence of how rapidly the sea lamprey is spreading is contained in numerous reports received by the Service. The presence of mature or spawning sea lampreys has been verified in 92 streams in Michigan, and reliably reported in 18 others. Lampreys have also become established in two inland lakes, Burt and Mullet, and were present in Lake Charlevoix and Pentwater Lake.

A similar situation exists on the Wisconsin shore of Lake Michigan. Reports received by the Service from the Wisconsin Conservation Department, which operates a weir on Hibbard Creek (Door Peninsula), reveal that lampreys are on the increase there. In the Kewaunee and Michicott Rivers, the 1949 runs were extremely large although neither river had previously had an important run.

A considerable number of lampreys have invaded Indiana streams, the Service has been advised, sizeable run having entered the Little Calumet River in late May.

Commercial fishermen report that the lampreys are becoming more abundant in both Lake Huron and Lake Michigan. "Unprecedented concentrations" were observed in northwestern Lake Huron and the Straits of Mackinac in the fall of 1948.

On the Wisconsin shore of Lake Michigan, gill-net fishing for lake trout has been almost entirely abandoned and the catches of trout in pound nets are only a small fraction of those of former years.

The lamprey is not native to the upper four Great Lakes. Stocks now found in these waters are undoubtedly the progeny of lampreys that passed through the Welland Canal into Lake Erie where they were reported off Merlin, Ontario, in 1921, and at Sandusky, Ohio, in 1927. The lamprey reached the St. Clair River by 1930 and was in Lake Michigan off Milwaukee by 1936. In 1937 a large spawning run was observed in the Ocqueoc River. The first specimens from the U. S. waters of Lake Superior were reported from the western end of 1946. Now present in all of the Great Lakes, the parasite is most abundant in Huron, Michigan, and Ontario where it is found down to depths as great as 65 fathoms.

It has been discovered that sea lampreys cannot be utilized for the market. Preliminary analyses indicate that both their vitamin A potency and oil yield are much too low for commercial exploitation. It is possible that some lampreys can

be used for reduction purposes. A small quantity can be sold to biological supply houses. Cooking tests failed because of the soft body of the lamprey and its extreme susceptibility to fungus infection. A Canadian canning test, however, has shown some promise of success.



Sealskin Prices Decline at Fall Fur Auction

A good attendance of buyers marked the fall auction of the Fouke Fur Company in St. Louis at which 25,100 Government-owned fur-seal skins from the Pribilof Islands were sold for \$1,420,260, the Service announced on October 13. The auction, held Monday, October 10, also included South African and Canadian fur-seal skins.

The grand average for all skins was \$55.93, which showed a decline from the spring fur-sale of 5.7 percent. The marked trend in preference for darker shades of fur was continued. Black sealskins showed an advance of 10.9 percent, averaging \$68.53 each. Although the darker shades of matara advanced, lighter shades declined. The all matara average declined 11.1 percent; the average price for matara being \$55.52. Safari brown (the lighter skins) declined 5.1 percent, for an average of \$46.81.

The same company also sold 309 Government-owned blue-fox skins taken by the Pribilof Island natives. These averaged \$4.51, for a total of \$1,393.75.

The 1,625 Canadian government-owned matara brown sealskins sold at the auction for essentially the same prices commanded by the United States skins. South African Cape of Good Hope skins averaged \$23.62, showing a decline of 10.8 percent. The Government of the Union of South Africa offered 2,500 skins, and private shippers offered an additional 2,700 Cape of Good Hope sealskins.



Wholesale and Retail Prices

On September 13 this year the wholesale index for all foods was 166.3 percent of the 1926 average, 3.3 percent higher than on August 16, but 12.3 percent lower than on September 14 a year ago.

Wholesale prices for canned salmon during September this year showed weakness compared with August. Canned pink salmon prices in September dropped 11.5 percent under August and were 27.4 percent lower than in September 1948. On the other hand, canned red salmon prices during the month were 2.5 percent higher than in August, but still 7.4 percent lower than in September a year ago.

Retail food prices on September 15 showed an increase of 0.8 percent over August 15 this year, but were 5.1 percent below September 15, 1948. Fresh, frozen and canned fishery prices followed the same general trend and on September 15 were 1 percent higher than in mid-August, but 1 percent below mid-September 1948. This is the first time in more than a year that this index dropped below the corresponding period a year ago, and was due mainly to a weakening in canned fish prices. In mid-September, the fresh and frozen fishery products index was 2.2 percent higher than mid-August this year, but 1.5 percent below September 15, 1948. Retail

Wholesale and Retail Prices				
Item	Unit	Percentage change from--		
		Sept. 13, 1949	Aug. 15, 1949	Sept. 14, 1948
<u>Wholesale: (1926 = 100)</u>				
All commodities	Index No.	154.5	+1.8	- 9.0
Foods	do	166.3	+3.3	-12.3
<u>Fish:</u>				
Canned salmon, Seattle:				
Pink, No. 1, Tall	\$ per doz. cans	4.2478	-11.5	-27.4
Red, No. 1, Tall	do	6.1562	+ 2.5	- 7.4
Cod, cured, large shore, Gloucester, Mass.				
	\$ per 100 lbs.	15.500	0	+ 3.33
<u>Retail: (1935-39 = 100)</u>				
All foods	Index No.	204.2	+0.8	- 5.1
<u>Fish:</u>				
Fresh, frozen and canned	do	311.9	+1.0	- 1.0
Fresh and frozen	do	260.1	+2.2	- 1.5
Canned salmon:				
Pink	\$ per lb. can	56.2	-1.2	- 0.1

prices for canned pink salmon continued to decline and were 1.2 percent lower on September 15 compared to the previous month, and 0.1 percent lower than mid-September 1948. This is also the first time in over a year that pink salmon retail prices have gone below the corresponding period a year ago.



OUR OYSTER INDUSTRY

DO YOU KNOW

That practically all oysters are taken by fishermen using tongs or dredges; tongs are long scissor-shaped tools from 12 to 18 feet long with iron baskets fitting together at the tips, and can be used only in shallow water; dredges are rake-like devices to which are attached a bag (generally of chain) to catch the oysters loosened from the bottom as it is dragged at the end of a tow line

HAULING OYSTERS ABOARD A LONG ISLAND DREDGER.