THE MARINE FISHERIES REVIEW

With this issue we have set forth a new role for the former Commercial Fisheries Review, a new role that requires a new name: Marine Fisheries Review.

In the 34 years of its existence, CFR has performed a valuable service to its readers, providing, to quote from the masthead of the last issue, "A comprehensive view of United States and foreign fishing industries--including catch, processing, marketing, research, and legislation--prepared by the National Marine Fisheries Service." It was the creation of NMFS as part of NOAA less than two years ago that led to the action we have taken. NMFS has a much broader charter than its predecessor agencies, for it includes not only the old Bureau of Commercial Fisheries but the Migratory Marine Game Fish Program from the Department of the Interior's Bureau of Sport Fisheries and Wildlife as well. The Service is resource-oriented rather than user-group oriented, at the same time it maintains full regard for the legitimate needs of all user groups, the two major ones being, of course, commercial fisheries and marine sport fisheries.

Obviously, there is no hard line separating sport from commercial fish. Many, if not most species are of interest to both groups, though others are sought only by one or the other. Consequently research cannot rationally be divided into "sport" and "commercial" components. Rather, we must study fish populations as biological units interacting with each other and their environment. To this end our research programs and fishery laboratories and centers are integrated--there are no sport fish or commercial fish laboratories or centers, though there are of course projects of primary interest to either sport or commercial fishermen forming part of every major research program conducted by NMFS.

Allocation within and among user groups is a separate problem, but one which requires, for rational solutions, as complete an understanding of population dynamics and environmental factors as we can get. Our major new effort, the State-Federal Management Program takes full cognizance of the long-standing and often deep conflicts between commercial interests and sportsmen. Unfortunately, these conflicts are often serious, deep-rooted and bitter; they can only be resolved by perhaps equal amounts of knowledge, faith and goodwill. We hope to provide the former, and at least an atmosphere in which the latter can be nurtured. Marine Fisheries Review is a vehicle which we plan to use toward this end.

--Philip M. Roedel, Director
National Marine Fisheries Service

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ATLANTIC SALMON AIDED BY RECENT ACTIONS

More "significant and constructive" actions were taken from December 1971-May 1972 to protect the Atlantic salmon than in the previous decade. This is the theme of the editorial in the May 1972 Newsletter of the International Atlantic Salmon Foundation signed by its Executive Director, Wilfred M. Carter.

He lists these important developments:

- o December 1971--President Nixon signed a bill authorizing restrictions on imports from nations "conducting fishing operations in a manner or under circumstances which diminish the effectiveness of an international fishery conservation program."

  --A U. S.-Canadian statement urged an end to high-seas fishing for Atlantic salmon.

- o February 1972 --Denmark and the U.S. announced an agreement. Denmark would phase out its "high-seas salmon fishery" by 1976. It would "maintain the fishery for Atlantic salmon by local Greenland fishermen at approximately 1100 metric tons annually."

- o April 1972 -- Canada announced an immediate prohibition on the catching of Atlantic salmon by commercial fishermen over large areas.

- o May 1972 -- Quebec Province banned commercial fishing for salmon for the entire Gaspe Peninsula. Beginning in 1973, in an area from the North Shore as far east as Sept Iles, she will not issue permits to persons who are not bona fide salmon fishermen.

  -- At the annual meeting of the International Commission for the Northwest Atlantic Fisheries (ICNAF), the U.S. introduced a resolution embracing the substance of the Danish-U.S. agreement.

Canada strongly opposed the resolution. She said it offered "too little, too late." The Canadians argued that "the proposed phase-out is over too long a period (1972-1976) and the permissible inshore Greenland catch (1100 metric tons) is too high." They proposed an amendment that would end the high-seas fishery by March 1, 1973. The U.S. proposal was adopted.

Canada catches about 95% of the North America Atlantic salmon taken off Greenland.

Mr. Carter's editorial concludes: "We view recent events with satisfaction and believe that very substantial progress has been achieved toward the ultimate goal of that prohibition of the high-seas fishing for Atlantic salmon and the recognition of preferential harvesting rights for coastal producing states . . . The United States and Canada have publicly stated that they intend to cooperate closely and be mutually helpful in future programs for restoration and rehabilitation of Atlantic salmon runs in North America. There could be no more propitious moment to begin than right now."

IASF HELPS NORTH AMERICAN COUNCIL

The International Atlantic Salmon Foundation (IASF) provides the Secretariat for the North American Salmon Council (NAASC). The Council was formed in December 1971 to serve as a means for Atlantic-salmon conservation groups to pool their resources and knowledge.

The 15 member organizations of NAASC are: American Fisheries Society, The Atlantic Salmon Assoc., Bail des Chaleurs Salmon Assoc., Canada Wildlife Federation, The Conservation Foundation, Federation of Fly Fishermen, The International Atlantic Salmon Foundation, The Izaak Walton League of America, The Miramichi Salmon Assoc., National Wildlife Federation, Nova Scotia Salmon Assoc., Sport Fishery Research Found., Sport Fishing Institute, Trout Unlimited, and World Wildlife Fund.

FISHERMEN AND NMFS SEARCH FOR ALBACORE

This season, U.S. west coast fishermen are finding that albacore, the prized white-meat tuna, are scattered in pockets from northern Baja California to Vancouver Island. Although these pockets frequently produce high catches, the fishing often slacks off after several days and the fishermen have to search for new productive areas.

This unusual pattern of albacore distribution may be caused by extensive mixing of northern and central Pacific waters far offshore, says Dr. R. Michael Laurs, Leader, Fishery-Oceanography Investigations, NMFS Southwest Fisheries Center, La Jolla, Calif. This is one of the interesting facts emerging from the cooperative research surveys recently completed by La Jolla in association with the American Fishermens Research Foundation (AFRF). The two groups explored an area 400 to 1,200 miles off the Pacific west coast to locate the path followed by albacore tuna in their annual migration from the central Pacific to the nearshore fishery.

The Operation

The current program was coordinated in San Diego, Calif., by Dr. Laurs and Robert Insinger, AFRF Director. NMFS dispatched its research vessel "Townsend Cromwell" to take oceanographic measurements in June in this far-offshore region west of northern California to south of Ensenada, Mexico. Four albacore jig boats, chartered by AFRF, left San Diego on May 22; four more left on June 1 for 35-40-day cruises; an additional four boats left Astoria, Oregon, on June 15. The first albacore of the season was taken May 29 about 840 miles west of Ensenada, Mexico, by the "Typhoon", an AFRF charter boat.

Aboard the Cromwell, Ron Lynn, oceanographer, led a team of NMFS technicians in obtaining chemical and biological measurements of the ocean environment. This information was passed rapidly to the AFRF boats to assist them in locating favorable albacore fishing areas.

Contrast with 1971 Season

Lynn directed an albacore survey cruise in the same region in 1971 aboard the NMFS research vessel "David Starr Jordan". This year he reported that ocean conditions are markedly different. In 1971, there appeared to be little mixing between north and central Pacific waters, and the boundary between them was sharply defined. The Jordan's albacore catches in 1971 were limited to a zone just north of the boundary between the two waters. The 1971 albacore season developed in a typical manner along the coast from northern Baja California to Vancouver Island.

In contrast, this fishing season's oceanographic conditions are complicated. Large-scale eddies and wavelike features indicate mixing of northern and central Pacific waters. Thus far, the distribution of albacore catches along the Pacific coast has shown a similarly complicated pattern: small-to-moderate catches of fish scattered over a broad region, possibly in response to these oceanographic conditions.

Tag and Release 1,458 Albacore

While they made ocean temperature and color observations, the AFRF-chartered albacore vessels, half with NMFS fishery technicians aboard, measured, tagged, and released 1,458 albacore. Dr. Laurs says that the recovery of the tagged fish will help NMFS biologists understand the movements of albacore within the U. S. fishery; also, they will learn the proportion of fish that return to the U. S. fishery in later years. The tag returns will provide information on albacore mortality for La Jolla's population dynamics studies.

The discovery of commercial concentrations of albacore by the chartered vessels about 900 miles due west of Los Angeles indicates, Dr. Laurs believes, that fishermen can fish albacore profitably earlier in the year and further offshore than ever before.

POTENTIAL MARKET FOR SHRIMP HEADS?

Dov Grajcer

A method of preserving shrimp heads that may lead to expanded use of shrimp processing wastes in animal feeds has been discovered at the National Marine Fisheries Service Galveston Biological Laboratory.

The usual methods of stabilizing the powerful enzymes present in shrimp processing wastes are to heat or dry the wastes. Unfortunately, these methods destroy some of the nutritive value of the wastes, particularly the nutritive value to other shrimp.

As part of studies of sexual maturation in shrimp conducted at the Galveston Laboratory, a food was formulated to encourage rapid growth and sexual development. A major ingredient of this food is shrimp heads collected from a local shrimp processing plant. It was noted that the rapid breakdown of the heads caused by powerful enzymes could be halted by destruction of these enzymes with acid.

The treatment used to destroy these enzymes follows:

1. Fresh or frozen shrimp heads are ground and treated with concentrated hydrochloric acid until the pH of the mixture reaches 1.8. This mixture is allowed to stand 6 to 24 hours at room temperature.

2. A base such as ammonium hydroxide or sodium hydroxide is added to the mixture until it reaches a neutral pH (7.0).

3. Supplemental nutrients are added if desired. The shrimp feed being used in these maturation studies includes 1% cholesterol, 0.2% corn oil, 2.4% dextrose, and 1% vitamin mixture.

4. The mixture is bound with 5% gelatin, which is dissolved in warm water and added to the other ingredients. After the ingredients are mixed, they are placed in a refrigerator to gel.

5. The solid feed is cut into pieces of convenient size and dried in an air tunnel at room temperature.

Cholesterol is added to this experimental feed which is being used for studies of sexual maturation because it is suspected to be an essential precursor of some shrimp hormones. It may not be needed in this quantity in growth formulations.

The analysis of feed produced using this technique is:

	Percent
Protein	45.87
Fat	3.90
Moisture	34.69
Chlorides	2.86
Calcium as CaO	5.37
Phosphate as P_2O_5	1.81
Ash	12.28

The feed contains a high concentration of salt, which might limit its usefulness in some feeds, particularly if the shrimp heads made up a high proportion of the feed. However, the salt content of the feed developed at Galveston apparently has no adverse effects on shrimp. Growth rates of brown shrimp (Penaeus aztecus) fed this feed alone ranged from 80 mg to 110 mg per day between the sizes of 50 and 95 mm (total length).

The use of this technique may make shrimp processing wastes a more valuable feed supplement, thereby providing a market for wastes presently not utilized.

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Contribution No. 342.

CRAB-PICKING MACHINE IS PICKUP FOR INDUSTRY

A new crab-picking machine promises to be a significant economic boon to crabmeat producers, and to consumers, says Philip M. Roedel, Director of the National Marine Fisheries Service (NMFS).

"Not only does the ingenious new machine recover 30 to 50 percent more crabmeat from shells, it does the job much more rapidly and efficiently than traditional hand-processing can." He adds that tests have shown that the machine converts 1,000 pounds of crabs in shells into about 400 pounds of shell-free meat in an hour.

The process is based on the principle of centrifugal force, a technique used in manufacturing to separate liquids from solids. Crab bodies and legs are chopped mechanically into pieces that will yield meats of a selected size. The pieces are fed into the machine in a brine solution. A rotating bowl generates centrifugal forces that separate meat from shells because of differences in specific gravity. The shells are heavier and are discharged from one end of the machine; the lighter meat floats out the other. Fresh water quickly rinses off the brine.

Background

NMFS has been working on the new design with a New England commercial machine company for the past two years. The idea was conceived and tested in 1970 at the NMFS laboratory in Seattle, Wash. Throughout 1971, it was advanced at NMFS Gloucester, Mass. Here numerous tests using many crab species were conducted. The machine was put on the market about six months ago. Since then, seven have been ordered by companies in Alaska, the Chesapeake Bay area, Halifax, N.S., and Seattle.

Great Promise

The researchers believe the apparatus promises a large increase in production of all kinds of crabmeat. These range from presently harvested blue, dungeness, king, and tanner to red, rock, and sand crabs, presently underutilized because processing costs are too high.

Also, the machine can enlarge the yield of meat from lobsters -- particularly from rock lobsters. At present only rock's tail is used. The machine also is able to strip cooked fish frames efficiently. The reason for this is that chunks of meat picked are larger, and so are more attractive to consumers, than those resulting from other methods.

The machine is adaptable to clam shucking. The model is being used by a Chesapeake Bay firm to recover much more meat from catches of surf clams.

The Economics of It

The stainless steel centrifuge and drive system cost about $16,000. The chopping and feeding devices cost another $5,000-6,000. Costs for brine, power, and labor are negligible. Repeated experiments suggest the investment can be recovered in one picking season.

Tests have shown that half the available crabmeat is wasted in conventional methods. Added to that hidden loss is the high cost of labor: 30 to 60 cents a pound of hand-picked meats, depending on region. Another favorable factor is that the process requires little space. The machine needs only 4 by 4 feet of floor space and 6 feet of headroom. To match this output, a firm would need space for 60 people lined up at tables covering 30 by 50 feet of floor space.

Consumer Benefits

Consumers should profit. The process makes available a new supply of potentially cheaper seafood. The only real difference between a pound container of prime crabmeat and one of pieces produced by the machine is the size of meat chunks. But in nutritional value and taste, each pound is equal.

ROTHSCHILD NAMED DIRECTOR OF NMFS SOUTHWEST FISHERIES CENTER

On July 5, Dr. Brian J. Rothschild, 37, became Director of the Southwest Fisheries Center (SWFC), La Jolla, California. SWFC includes laboratories in La Jolla and Honolulu. Its scientists conduct fishery and oceanographic research in the central and eastern Pacific. Dr. Rothschild succeeds Dr. Alan R. Longhurst, who took a high-level fishery post in his native England. Directing the extensive activities of SWFC in the interim before Dr. Rothschild's appointment was Izadore Barrett, biologist and administrator.

Scientist and Teacher

Dr. Rothschild has worked for the federal fishery service for almost 8 years. Most recently, he was Deputy Center Director, Northwest Fisheries Center, Seattle, Washington. From 1962 to 1968, he served at the NMFS Honolulu Laboratory. From 1968 until 1971, he taught at the University of Washington. He returned to NMFS in September 1971.

Dr. Rothschild is the author of 45 publications, a member of 11 professional societies, and has served many working groups and committees, domestic and international, in fishery research and oceanography.

A native of Newark, New Jersey, he earned his B.S. at Rutgers University, M.S. at University of Maine, and Ph.D. and postdoctoral degrees at Cornell University. He has taught at the University of Hawaii.

BIOLOGIST AT LA JOLLA LAB SEEKS TO DEVELOP ARTIFICIAL FISH FOOD

"Some of the small anchovy larvae now being reared in the experimental aquarium at the NMFS Southwest Fisheries Center Laboratory in La Jolla, California, may grow to adulthood without ever eating any of the small planktonic crustaceans which form the natural food of their wild cousins in the ocean," the lab states. This is the objective of Douglas E. Conklin, 30, a biologist awarded the first NMFS National Research Council Research Associateship. He will attempt to develop and test a laboratory-prepared microencapsulated food for northern anchovy larvae. The Center provides for postgraduate scientists and engineers to work on basic research problems with its professional laboratory staff.

Superb Aquarium-Laboratory

Mr. Conklin will work in one of the largest and best equipped sea-water aquarium-laboratories. A broad research program on the physiology of marine fishes and their food organisms is in progress under the direction of Dr. Reuben Lasker, physiologist. Staff scientists are measuring the effects of such environmental factors as salinity, temperature, and pollutants on the growth and survival of larval fishes. They are exercising large fishes in special tanks to observe physiological and behavioral changes. They are developing successful techniques for spawning and rearing marine fishes for experimental work and mariculture.

Manmade Food Important

Dr. Lasker explained the importance of having manmade food particles available. The particles are buoyant, nutritious, and sized for the small mouths of first-feeding larvae. They will free scientists from the necessity of capturing and culturing planktonic organisms to feed the fish larvae. The particles will open a vast area of study into the nutrition and development of many marine fishes which, historically, have been difficult to maintain in the laboratory or in hatcheries.

Dr. Oscar Sette, Distinguished Marine Scientist, Is Dead

Dr. Oscar Elton Sette, who made major contributions to marine science for half a century, died on July 25, 1972, at Palo Alto, California. The 72-year-old fishery scientist, administrator, and teacher was one of the pioneer researchers in the Pacific and Atlantic Oceans. He was among the first to integrate fishery biology with oceanography and meteorology.

He was born in Clyman, Wisconsin, in 1900, earned his B.A. in Zoology at Stanford University in 1922, his M.A. in Biology at Harvard University in 1930, his Ph. D. in Biology at Stanford in 1957.

In 1929, he went to work for the State of California in the field of marine scientific investigation. In 1924, he joined the U.S. Bureau of Fisheries (a precursor of the National Marine Fisheries Service). For the next 48 years, he held prominent positions as a Government scientist and administrator. He was an expert on mackerel, sardines, and tuna.

International Roles

Dr. Sette was instrumental in organizing and administering the Pacific Tuna Conferences and the Eastern Pacific Oceanic Conference in the 1950s. He was a U.S. delegate to the International Technical Conference on Living Resources of the Seas, Rome, 1955; adviser to the U.S. delegation at the Fisheries Conference, Santiago, Chile, 1955; and a delegate to the Law of the Sea Conference at Geneva, 1958.

Honored

In 1961, Dr. Sette received Interior Department's highest honor, the Gold Medal for Distinguished Service. The Secretary said: ". . .He has always placed special importance on the training of scientists. . .These efforts have had an important influence upon fishery science in the United States and Canada."

In December 1971, NMFS Director Philip M. Roedel wrote a dedication for the "Oscar Elton Sette" issue of the NMFS Fishery Bulletin: "With this issue we honor as best we can someone who has earned the respect and admiration of those fortunate enough to have crossed his path during a long and most honorable career. He is in the truest sense a gentle man."

On his death, Dr. Sette was consultant and adviser to the NMFS laboratory at Tiburon, California, in charge of the ocean ecology unit.

'ARTIFICIAL OCEAN' WILL TEST OIL-SPILL CLEANUP METHODS

An "artificial ocean" containing its own wavemaking machinery will be built in New Jersey by the U.S. Environmental Protection Agency (EPA) to test equipment designed to clean up spills of oil and other hazardous materials. The world's first, this concrete test tank costing $1.8 million will be 600 feet long and hold more than two million gallons of water.

It will be built on 5 acres of marshland on the south shore of Raritan Bay. May 1973 is the completion target. Its name: OHMSETT (Oil and Hazardous Materials, Systems Environmental Test Tank).

The Facility

The facility will test new types of booms, skimmers, and other devices used to contain and clean up spills. To approximate realistic conditions, OHMSETT will have a wave generator to produce regular, irregular, and "confused" waves up to two feet high. The tank, 65 feet wide and 8 feet deep, will hold about 2.6 million gallons of water drawn from Raritan Bay. A tracked bridge spanning the tank will tow test equipment lengthwise down the tank at speeds up to six knots.

Helpful Data

The data collected will be transmitted to a small control building for recording and processing. Water-quality analysis will be done in a small lab near the tank.

The data will help EPA reduce the harmful impact of accidental discharges of hazardous pollutants upon beaches and the marine environment. These spills have become a major problem for U.S. lakes and coastal waters. In 1970, the U.S. Coast Guard recorded 3,335 oil spills (about 15 million gallons) and hundreds of spills of hazardous materials totaling about 250,000 gallons.

EPA Precautions

Because OHMSETT will operate continuously with oil and other hazardous materials, EPA is insuring that the tank does not harm the environment. Wastewater, oil, and other materials from the tank will be piped directly to an adjacent treatment facility; the effluent from there will be of higher quality than the water pumped in from Raritan Bay. Oily portions separated from the wastewater will be refined. Solids will be stored and transferred later to State-approved landfill site.

NOAA SIMPLIFIES WAYS TO CALCULATE TIDAL CURRENT SPEED

NOAA has developed a simplified method to calculate the speed of tidal currents in bays, estuaries, and harbors as an aid to mariners. The new method is to be used along with the tidal current charts published by NOAA's National Ocean Survey.

At present the mariner spends time calculating the speed of a current at any given time. These computations are sometimes difficult for inexperienced boaters and lead to error.

Demetrio A. Dinardi, developer of the new method, says it can be learned quickly by any inexperienced boatsman. The system depends on computerized diagrams, one for each month of the year. The diagrams identify which chart to use and make it easy to compute the speed of the current.

The first diagrams are for use with the tidal current charts for Block Island and Long Island Sound. Later, it is planned to publish similar diagrams for use with other tidal current charts. At present, tidal current charts have been published for Boston Harbor, Narragansett Bay to Nantucket Sound, Narragansett Bay, New York Harbor, Delaware Bay and River, Upper Chesapeake Bay, Charleston (S.C.) Harbor, San Francisco Bay, Puget Sound (Northern Part) and Puget Sound (Southern Part).

A set of 12 diagrams for use with tidal current charts for Block Island and Long Island Sounds can be obtained for $1 from National Ocean Survey (NOS) Distribution Division (C44), Washington, D.C. 20235, or from NOS nautical chart sales agents.