Both authors are members of the staff of the Northwest Fisheries Center Auke Bay Laboratory, National Marine Fisheries Service, NOAA, P.O. Box 155, Auke Bay, AK 99821.

the turf were placed on the bottom of a transparent plexiglass box 10 × 20 × 30 cm deep. The box was covered to exclude light except for brief periods when it had to be inspected.

In November 1973, 1,424 eyed pink salmon eggs were placed on the surface of the top layer of turf. An upwelling flow of 761 ml/min was supplied. The eggs hatched normally, and within 3 days the alevins fell or swam down through the spaces in the turf until they reached the bottom layer. During the next 2 or 3 weeks, the alevins distributed themselves until they were evenly dispersed in all but the top one or two layers of turf. They continued to occupy the lower six or seven layers until they emerged as fry. The peak of emergence occurred in April concurrently with the peak of emergence of fry from gravel incubators. Survival from eyed eggs to fry in the incubator with the turf substrate was 98 percent.

The high porosity of AstroTurf and the low density of the plastic relative to gravel are responsible for its superiority as substrate in our incubators. For example, to raise 1 million eggs would require about 120 square feet of floor space with incubators filled with gravel versus only 40 square feet with incubators filled with turf. These incubators would require about 13 cubic yards (about 36,000 pounds) of gravel but only 3.2 cubic yards (about 530 pounds) of AstroTurf. This large quantity of gravel must be graded by size, washed, and shoveled by hand into and out of the incubators. Moreover, turf is easier to clean and store in the off-season.

MFR Paper 1097. From Marine Fisheries Review, *Vol. 36, No. 10, October 1974. Copies of this paper, in limited numbers, are available from D83, Technical Information Division, Environmental Science Information Center, NOAA, Washington, DC 20235.*

NOAA/NMFS Developments

NMFS Inspection Aid Offered Fish Plants

A new inspection service for fish processing plants is now being offered by the National Oceanic and Atmospheric Administration. The processing plant itself is the target of inspection rather than the food items produced.

The service, rendered by NOAA's National Marine Fisheries Service, is expected to benefit both manufacturers and consumers of seafoods. It was established partly in response to many requests for such a service from owners and operators of processing facilities. Heretofore, plant inspection was available only as a part of the more comprehensive (and more expensive) product inspection service offered by the Commerce Department agency.

Under the new system, officially put into operation early last summer by notice in the Federal Register, NMFS will help fish processing plants establish and maintain satisfactory levels of plant sanitation and hygienic practices that will facilitate the production of clean, safe, and wholesome seafoods. The inexpensive service is being made available on a voluntary, fee-for-service basis, and entails inspection of plants only, unless the processor desires inspection and certification of fishery products as well.

The mode of operation for the "Sanitarily Inspected Fish Establishment Service" involves, first, a request by a seafood company for the expert assistance of a member of the NMFS Fishery Products Inspection and Safety Program to analyze the sanitary conditions in its plant. After the NMFS inspector, working with plant personnel, has conducted a series of sanitation surveys designed to pinpoint the strengths and weaknesses of the facility and processing system under scrutiny, he presents a proposal for the necessary improvements in hygienic conditions and practices, if needed.

Once the weaknesses have been eliminated a brief visit will be made to the plant by an NMFS inspector once or twice a week to maintain the status quo. It is expected that most plants, once approved, will continue the inspection service, primarily to assure the maintenance of high standards of operation.

When all minimum sanitary requirements have been met, the NMFS awards a plaque to the company, attesting to the fact that its plant facilities and operating practices are capable of producing clean and safe fishery products. The name of the processor is then included on a list of commercial seafood producers that are inspected and approved by the Federal Government. The list is published once every three months, with updating and amendments each month, in the NMFS "Guide to Federally Inspected and Approved Fish Establishments and Products." Such listings are widely distributed and recipients include many potential buyers such as schools, cafeterias, restaurants, and food chains.

If a fish processing plant becomes unable to meet the sanitary inspection requirements and is unwilling to correct deficiencies, it will lose Government approval, and it must return the NMFS certificate of approval and lose its place on the approved list appearing in the Federal Guide. Similarly, if an approved plant discontinues the voluntary inspection service, it loses its official status.

Inquiries concerning the new voluntary inspection service may be addressed to the Director, National Marine Fisheries Service, NOAA, Washington, DC 20235.

NOAA Picks Kolf As CZ Coordinator

Richard C. Kolf has been named Coastal Zone Coordinator in the National Oceanic and Atmospheric Administration's Office of Sea Grant.

In this new position, Kolf acts as

liaison between the Commerce Department agency's Office of Sea Grant and Office of Coastal Zone Management to assure that work being conducted under the National Sea Grant Program is coordinated with federal, state, and local needs set forth in the Coastal Zone Management Act of 1972. Kolf, formerly with the National Science Foundation, is also Sea Grant Associate Program Director for Project Support Programs.

The Office of Sea Grant administers federal grants for marine-related projects in research, education, and advisory services to universities, laboratories, and other institutions. The purpose of the National Sea Grant program is to encourage the development of America's marine resources in the waters and coastal areas of the oceans, the Gulf of Mexico, and the Great Lakes.

Before joining NOAA, Kolf was with the Division of Environmental Systems and Resources of the National Science Foundation, where he was responsible for coastal zone matters involving the agency's Environmental Systems Program. Prior to this, he was a Staff Associate in the NSF Office of Interdisciplinary Research, and Program Director for Undergraduate Instructional Programs. In addition to engineering experience in private industry, Kolf has taught at the University of Wisconsin (where he received his B.S., M.S., and Ph.D. degrees), Marquette University, and Loyola University. During his tenure as Dean of Loyola's College of Engineering, Kolf achieved initial accreditation of all three Engineering Departments—Civil Engineering, Mechanical Engineering, and Electrical Engineering—by the Engineers' Council for Professional Development.

A native of Oshkosh, Wis., Kolf is a World War II veteran of the U.S. Navy. He is a member of Chi Epsilon (Civil Engineering), Sigma Xi (Research), the American Society of Civil Engineers, and the Marine Technology Society.

Bruce Collette Is New NMFS Scientific Editor

Bruce B. Collette, Assistant Director of the National Marine Fisheries Service Systematics Laboratory in Washington,D.C., has been appointed Scientific Editor of the NMFS publication series including the *Fishery Bulletin*, Special Scientific Report - Fisheries (SSRF), Circular, and Data Report. He replaces Reuben Lasker, who returns to full-time research at the Southwest Fisheries Center, NMFS in La Jolla, Calif., after having served 4 years as Scientific Editor.

Collette

Collette, an ichthyologist with the NMFS since 1960, is recognized as an expert on the systematics of epipelagic fishes, particularly the tunas, mackerels, needlefishes, and halfbacks, and has written about 70 scientific contributions on these and other topics.

Collette served from 1964 to 1968 as Ichthyological Editor of *Copeia*, the journal of the American Society of Ichthyologists and Herpetologists, a scientific organization of which he is now secretary.

Manuscripts to be considered for publication in any of the above NMFS series should be sent to: Dr. Bruce B. Collette, Scientific Editor, Systematics Laboratory, National Marine Fisheries Service, NOAA, National Museum of Natural History, Washington, DC 20560.

Finance Rules Told For Fishing Vessels

The adoption of revised permanent regulations, of particular interest to the fishing industry and those who finance fishing vessels, has been announced by the National Oceanic and Atmospheric Administration. Details were published by the Commerce Department agency in the *Federal Register* of 17 May 1974, concerning the administration—through the National Marine Fisheries Service—of the Fishing Vessel Obligation Guarantee program.

The program is authorized by Title XI of the Merchant Marine Act, 1936, as amended. It facilitates the private capital market's responsiveness to the investment capital needs of domestic commercial fishermen by guaranteeing obligations given to aid in financing or refinancing up to 75 percent of the cost of constructing, reconstructing, or reconditioning commercial fishing vessels of five net tons or over.

The new regulations, which are generally regarded as less restrictive than earlier ones, incorporate a number of the comments received by the Secretary of Commerce about interim regulations proposed 31 July 1973, for administering the guarantee program.

Major revisions involve: reducing the guarantee fee from 1 percent to 0.5 percent per annum of the guaranteed obligation's average outstanding principal amount, adding flexibility to criteria for determing economic soundness, and defining the term "facilities or equipment" pertaining to marine operations. Other minor revisions are procedural, editorial, or for clarification purposes. Further information may be obtained from the Financial Assistance Division, National Marine Fisheries Service, NOAA, Washington, DC 20235.

Raymond Hubley Gets Conservation Post

Raymond C. Hubley, Jr., 42, executive director of the Izaak Walton League of America since 1971, has been named to a key conservation post in the National Oceanic and Atmospheric Administration, according to NOAA's National Marine Fisheries Service.

Hubley

In the Commerce Department agency, Hubley serves as Conservation Coordinator on the staff of NMFS Director Robert W. Schoning. Created

last summer the new position requires that the incumbent serve as the key contact for NMFS in all matters pertaining to planning, coordinating, and reviewing environmenal impact and conservation efforts. His work touches on virtually all functions of the Fisheries Service and will require close liaison with the fishing industry, federal agencies, state organizations, Congressional units, and related scientific and trade organizations as well as a variety of conservation and environmental groups.

Director Schoning said: "Ray Hubley is well known throughout the country, not only for his work in the Izaak Walton League but also as a member of the Natural Resources Council of America and a representative on the North American Atlantic Salmon Council. He is highly regarded in federal, state, and private conservation circles.

"We are happy to have Ray join us to coordinate our continuing communication with the various groups who represent so many millions of Americans who have a growing concern for the environment."

Hubley was graduated from Winona State College in Minnesota in 1957 with a bachelor's degree in biological sciences and chemistry. Later he did graduate work in fish and wildlife management at the University of Minnesota. During 1964 and 1965 he studied natural resources economics and public administration at the George Washington University, Washington, D.C.

His earlier employment includes five years as a river survey biologist with the Wisconsin Department of Natural Resources, two years with the Department of the Interior's Fish and Wildlife Service in Minneapolis, and two years with the Lower Colorado River Land Use Office, Yuma, Ariz., in recreational land use planning and staff administration. From 1966 until accepting the position with the Izaak Walton League he rejoined the Fish and Wildlife Service in Minneapolis and served as coordinator of the five-state Upper Mississippi River Conservation Committee at Davenport, Iowa. Hubley and his wife Jo Ann have three children and reside in Reston, Virginia.

Ayers to Manage NMFS Game Fish Programs

Robert J. Ayers has been named to the post of assistant to the Director of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, to coordinate game fish programs. He reported for duty at the Washington, D.C., headquarters of the Fisheries Service on June 10, 1974, following the Commerce Department agency's intensive search for a highly qualified candidate.

Ayers

Ayers has spent all of his 16-year professional career as a fisheries, wildlife, and environmental specialist in the Midwest and on the Pacific coast. For the past two years the 47-year-old biologist has been chief of the Environmental Resources branch, Corps of Engineers, Cincinnati, Ohio.

Representing NMFS Director Robert W. Schoning, Ayers' primary duty will involve the integration of the many recreational fisheries programs and endeavors conducted at the various NMFS field stations throughout the country into one national program. He will work closely with the States, national conservation agencies, game-fish associations, the public, and other Federal agencies toward the development and maintenance of an efficient and versatile marine recreational program. An intrinsic part of such an approach is the wise and expansive use of natural marine resources, combined with an attentive attitude toward their conservation or renewal.

"This is a difficult and demanding job, and I am delighted that Robert Ayers is going to undertake it," the NMFS Director said, adding: "I am convinced that the entire fisheries community, both sport and commercial, will benefit as a stronger and more central organization for recreational fisheries evolves under Mr. Ayers' management."

A native of Oregon, Ayers earned his B.S. degree in fisheries at Oregon State University. His first full-time job was as a shellfish biologist with the Oregon Fish Commission, after which he served in successively more responsible positions with that organization, then with the Corps of Engineers in Oregon and Washington. He has received several awards for outstanding Federal service, and is the author of several scientific publications. Mr. and Mrs. Ayers and their two children live at Cincinnati, Ohio.

NOAA Reemphasizes Marine Mammal Ban

The taking of a marine mammal, dead or alive, without a permit is an illegal act that can subject the taker or possessor to a fine, an arrest, or both, warns the National Oceanic and Atmospheric Administration. The protected species are porpoises, seals, sea lions, whales, polar bears, sea otters, manatees, and walruses. Under the provisions of the Marine Mammal Protection Act of 1972 and related regulations, none can be taken without a scientific research permit or a public display permit.

The prohibition has been restated by NOAA owing to an increase in numbers of marine mammals salvaged for their skins by people who found them on U.S. beaches, obviously soon after death occurred. The Commerce Department agency's National Marine Fisheries Service administers and enforces the Act as it applies to sea lions, seals, porpoises, and whales. The other marine mammals are the responsibility of the Department of the Interior.

Seals and sea lions are the most commonly found species. In each instance the finder, even though unaware of wrongdoing, is guilty of a violation of the law if in possession of a marine mammal. The correct procedure is to leave the carcass where it is and inform state or local enforcement authorities or the local conservation department of the situation.

The ban against retention does not apply to bones, teeth, or ivory of marine mammals found on certain shorelands, provided such items are registered with agents of either the NMFS or the Bureau of Sport Fisheries and Wildlife within 30 days of collection.

To date, but *only* as a temporary measure, a very small number of law violators have been punished only to the extent of being forced to relinquish marine mammal pelts when State authorities found them to be in illegal possession. NMFS authorities said, however, that a stricter application of the law will now prevail in such situations. A violator, according to the legal provisions covering such occasions, can be fined as much as $10,000 per violation.

By a Letter of Agreement dated 10 April 1974, arrangements were completed between the NMFS and the Smithsonian Institution, authorizing the Institution to collect and utilize for scientific research dead marine mammals found on U.S. beaches. A system for a full record of each collection transaction is provided for in the agreement. The rights and responsibilities of the states as set forth in marine mammal legislation are not affected in any way under the new arrangement. The agreement pertains to those species under NMFS responsibility and does not include marine mammals listed as endangered or threatened under the Endangered Species Act of 1973.

Fish Name Uniformity Has Popular Support

Consumers of fish and fishery products should benefit when a National Oceanic and Atmospheric Administration program to develop uniform market names for fish and fishery products is completed. By early summer the Commerce Department agency had received a total of 525 comments in response to an invitation to the public to comment on the need for clarification of the names of certain species of fish that are known by various names in different parts of the country. Thousands of species are known throughout the world by scientifically accurate names, but the differing common names used in labeling some species cause problems in marketing and market development, and could disrupt any attempts to write uniform labeling regulations.

NOAA's National Marine Fisheries Service also pointed out that there is increasing interest in using fish and shellfish which have not previously been marketed generally, and for which no common names exist that are familiar to U.S. consumers. A spokesman said that new food processing techniques now present opportunities to develop new fishery products which have no recognized names.

Of the 525 comments received, 471 came from individual consumers, including housewives, students, and fishermen. Generally, these responses made specific suggestions for different names for a certain few species that now have what are considered undesirable names. Most of these responses favored the proposal for improving the market names of some species.

Among the suggestions received were:

Current common name	Some suggested names
Dogfish	Petfish, roverfish, streaker
Wolffish	Packfish, willowfish, lobofish
Cancer crab	Zodiak, july, smoking crab
Jack	John, jill, union jack
Barred grunt	Wimperfish, chatterfish, striped sounder

Fifty-four comments came from fish processing, marketing and consulting firms, trade associations, and federal and state agencies and commissions. Although these comments varied, some significant points were made repeatedly. Nearly 70 percent of these agreed that a need exists for such a program. Most indicated that NMFS is the appropriate Federal agency to perform the function. None of these 54 responses opposed the plan or indicated that the Fisheries Service was not the proper agency to undertake the project. Consumer needs were recognized as important in many responses because aesthetic and truthful labeling is necessary, as well as proper and accurate product representation.

James R. Brooker, of the NMFS Fishery Products Inspection and Safety Program, has been named coordinator of the nomenclature program. Brooker said that NMFS will request proposals from expert sources as to the most appropriate and systematic way of approaching the overall problem. A contractor will be selected to conduct certain functions to implement the plans and design a format for presenting product names in an organized manner, and NMFS will consult with appropriate organizations in the public and private sector relative to plans and procedures. Brooker said the program requires a lengthy procedure requiring coordination with regulatory groups such as the Food and Drug Administration and with the American Fisheries Society, consumer groups, and the fishing industry.

NOAA Studies Possible Designation of Puget Sound as a Killer Whale Research Sanctuary

The National Oceanic and Atmospheric Administration has announced a preliminary study to ascertain whether it is feasible to declare the waters of Washington State's Puget Sound a research sanctuary solely for killer whales.

The Commerce Department agency said that the authority to create such a sanctuary is contained in the Marine Protection, Research, and Sanctuaries Act of 1972. The Act names the Secretary of Commerce as the individual who may designate a marine sanctuary, after consultation with the Secretaries of State, Defense, the Interior, Transportation, the Administrator of the Environmental Protection Agency, other interested Federal Agencies, the State(s) involved, and with the approval of the President. The NOAA Administrator exercises the authority of the Secretary of Commerce in actions involving marine sanctuaries.

Proposed operating procedures under the new Act call for consultation with responsible officials of States, the obtaining of gubernatorial consent, the holding of public hearings, and the subsequent issuance of pertinent regulations. Under the Act, provided certain criteria are met, sanctuaries can be created for purposes of species preserves, research areas, habitat preserves, or recreational and esthetic areas.

Closely involved in actions related to the conduct of the inquiry will be NOAA's Office of Coastal Zone Management and National Marine Fisheries Service. The latter is responsible for the management and protection of seals, sea lions, porpoises, and whales

under the Marine Mammal Protection Act of 1972.

The Puget Sound sanctuary project evolved as a result of concern expressed by Senator Warren G. Magnuson of Washington State on his own behalf and that of a number of his constituents. Senator Magnuson conveyed his sentiments in a letter to NOAA Administrator Robert M. White, stating in part:

"I believe the killer whale is of such special status and such a unique resource that Puget Sound should immediately be designated a 'killer whale' sanctuary and be reserved purely for scientific research, observation, and study of the killer whale population."

NOAA's immediate response was to set in motion an inquiry into all germane elements, toward the production of recommendations concerning the Puget Sound Sanctuary question as soon as possible. No official action with regard to declaring the Sound a marine research sanctuary can be undertaken until a series of conditions have been met, beginning with the NOAA feasibility study and proceeding through a series of legally prescribed steps, including public hearings and an environmental impact statement.

Interest in the broad considerations surrounding killer whales mounted recently when a public hearing under provisions of the Marine Mammal Protection Act was held in Seattle, Washington to consider an application by Sea World, Inc. to take four killer whales from waters that include parts of Puget Sound. In early 1973 Sea World had received a letter of exemption under the Marine Mammal Protection Act permitting the taking of four killer whales from Puget Sound for display purposes. In granting that letter of exemption, NOAA/NMFS officials had determined, among other things, that the taking could be accomplished without detriment to killer whale stocks. Because Sea World was unable to capture the desired whales in the time remaining between issuance of the letter of exemption in March 1973 and its expiration in October 1973, the company requested another permit—under the longer term provisions of the Act—to take the same number of whales. Based on the determination by Federal scientists that virtually identical conditions prevail now with respect to killer whale stocks, a permit was issued by NMFS Director Robert W. Schoning on 6 May. The permit authorizes Sea World, Inc. to capture the four killer whales before 31 December 1976, from the same carefully delimited area of Puget Sound as that previously authorized.

Conditions of the permit include provisions for authorized observers during capture operations to insure humane taking of the whales. Custodial care is subject to continual review and inspection—for the rest of the whales' natural lives—by personnel of NOAA's Fisheries Service.

Scientific knowledge of the life cycles, population dynamics, and migration patterns of killer whales is not extensive, though a need for such data has been recognized by marine mammal biologists for some time. It is known that killer whales are found in worldwide distribution, but very little definitive information exists on the total populations or the particular populations of this valuable natural resource that occur in U.S. waters.

As a part of the permit granted to Sea World, Inc., the company is obligated to lend significant assistance to further killer whale study and investigations in Puget Sound. NOAA thus may avail itself of the corporation's experience with marine mammals in the region and its familiarity with the Puget Sound ecosystem. Conditions of the permit also require that these killer whales used for public exhibition purposes by Sea World, Inc., be made available for scientific research to persons authorized by the NMFS Director, ". . . so long as such research and observation does not interfere with the training and displaying of the animal."

NMFS Director Schoning said that he had received requests for permission to conduct killer whale research in Puget Sound to establish broader scientific data on life cycles and migratory patterns of killer whales from both the Washington Department of Game and the marine mammal program of NMFS.

Sportfishing Data Sought by NMFS

Marine anglers of the Atlantic coast are being asked to record details of fishing adventures—not only about fish caught but also about the ones that got away.

Several thousand marine recreational fishermen will be asked, by mail and telephone, to assist National Oceanic and Atmospheric Administration statisticians toward the compilation of uniform and complete records of the annual harvest of marine fish and shellfish, in a program begun last summer.

The Commerce Department agency began the extensive survey of sport fishing in Maine, New Hampshire, Vermont, Connecticut, New York, Rhode Island, Massachusetts, Pennsylvania, New Jersey, Delaware, Maryland, Washington, D.C., Virginia, and West Virginia. The work is being done by a private data collecting firm under contract to NOAA's National Marine Fisheries Service. In due time, the study will be expanded to include all national marine fishing regions. State and private sport-fishing organizations have helped NMFS fisheries experts prepare a list of survey questions. After receipt of answers, the Fisheries Service will analyze and publish the findings.

In the first phase of the Marine Sport Fish Statistics Program, 27,000 households are being briefly questioned by telephone to establish a valid mailing list of active saltwater fishing households. Next a more detailed questionnaire is mailed to a selected sample of several thousand households, querying them on a confidential basis about: how often and how many anglers of what age and sex fished when, where, and how; what kinds of fish and shellfish were caught in what quantity; how the catch was used; and how much time and money were spent on sport-fishing activities. Expert surveyors say that, as a general rule, only about 30 percent of any given mailing list of contacts responds to such questionnaires; therefore, the surveyors planned to complete an-

other round of telephone calls to non-responders after a specific period of time. Thereafter, a mail-and-telephone-call sequence will be repeated every two months to collect the desired data over a full calendar year.

Plans call for a continued data collecting on the same general basis through 1976, after which geographic coverage will alternate between the eastern and western halves of the United States from one year to the next.

Accurate and current statistics surrounding how much of an effort is made to catch what amount of fish are prerequisites for the production of assessments of all kinds of fish populations. Such assessments, in turn, are vital to fisheries biologists and conservationists as they work toward sound management of marine resources.

The Marine Sport Fish Statistics Program has been preceded by other less extensive surveys of national sport fishing habits, conducted at 5 year intervals since 1955 by the Bureau of the Census. The NMFS program was designed to allow for complete, up-to-date information on the national harvest of fish products heretofore routinely collected for the commercial catch, but available only on an incomplete, non-timely basis for the sport catch. The new survey method, among other things, will permit NMFS fisheries statisticians to add the annual sport catch to the yearly commercial catch to reach an aggregate—and thus more accurate—annual total.

Texas Has Poor Brown Shrimp Catch in 1973

Although final figures are not yet available, the brown shrimp *(Penaeus aztecus)* catch from the Texas offshore shrimping grounds was approximately 25,000,000 pounds (heads-off) in 1973. According to K. N. Baxter, Supervisory Fishery Biologist, NMFS Galveston Laboratory, this was the poorest annual harvest of brown shrimp from these grounds in the past 7 years, with the exception of 1969. Taking into account Baxter's estimate of availability of brown shrimp biomass, 1973 was likely the lowest for the Texas coast in 12 years.

Brown shrimp year-class strength, predicted by monitoring abundance of postlarval and juvenile shrimp in the Galveston Bay area, indicated that the 1973 harvest would fall below the annual catch of any of the previous six years. However, unusually high concentrations of juvenile brown shrimp in central and lower Texas estuaries kept the 1973 catch above that of 1969 and above the extremely low offshore harvest of 1961 and 1962. Greater fishing pressure also may have helped to produce the larger than expected catch. For example, there were 600 steel-hulled "supertrawlers" fishing Texas brown shrimp in 1973 that were not in the fishery in 1969, according to information supplied by NMFS Division of Statistics.

In 1973, Texas offshore fishing between Galveston Bay and Matagorda Bay on the upper coast, historically the best brown shrimp fishing grounds off Texas, produced the lowest catch ever recorded for that area, but the lower coast grounds between Aransas Pass and Brownsville produced the highest brown shrimp catches recorded to date for that area. In fact, the ports of Brownsville and Port Isabel alone accounted for a record 4,000,000 pounds (heads-off) of Texas brown shrimp caught in July, an occurrence never before enjoyed by those two ports.

Environmental conditions, especially in bay systems on the upper Texas coast, probably contributed to the lowered catch off Texas. Heavy rainfall and runoff into the eastern portion of the Galveston Bay system and accompanying lowered salinities apparently rendered a rather large part of the nursery uninhabitable for young brown shrimp. The inferior brown shrimp year class also could have been caused by reduced spawning or by poor survival of early life stages offshore or both. Only one group of young brown shrimp, first distinguishable as postlarvae entering the Galveston Bay area and later as juveniles inside the estuaries on the upper Texas coast, was detected in 1973. In most years, three and sometimes four different groups are recognizable in the nursery areas during a growing season.

Other shrimp species also may have been affected by prevailing environmental conditions in 1973. For example unprecedented catches of seabobs, *Xiphopeneus kroyeri*, occurred off the San Bernard River area near Freeport, Tex. late in 1973 and early in 1974 (NMFS Division of Statistics). Normally this species is not available in commercial quantities west of the Sabine River (Texas-Louisiana). Increased catches of this species also may have been partly due to diversion of fishing effort from brown shrimp to other more available species.

Foreign Fishery Developments

Fish Sausage Plant Slated for Russia

The Soviet Ministry of Fisheries and the Taiyo Fisheries Company have "agreed in principle" that a fish sausage plant will be built by the Japanese company in the Soviet Far East. The plant, which reportedly will have a daily output of 100,000 sausages, will cost the equivalent of $3.5 million.[1] The Soviets will make a 20 percent down payment and pay the remainder over the next 5 years at an interest rate of 6.5 percent, according to a report in the *Nikon Keizai Shimbun*.

According to the NMFS International Fisheries Analysis Division, the building of a fish sausage plant by the Japanese in the USSR was first discussed in 1964 by the Taiyo Company and the Soviet Machinery Import Corporation (Prodintorg). Taiyo, at that time, presented two proposals: the first was for a plant with a capacity of 200,000 sausages per day, costing 1.6 billion yen (US$4,440,000)[2], the second for a plant with half that capacity, costing 1.0 billion yen (US $2,722,000)[2]. Despite Soviet interest, no contract was concluded.

The Japanese exporters, however, continued to nurture Soviet trade contacts. The Hayashikane Company demonstrated fish sausage and surimi (minced fish) machinery at the Nakhodka Marine Fair in 1968. Soviet fisheries experts displayed much interest in both the processing equipment and the finished products. The

[1] At the current exchange rate of US$1.00 = 280.00 yen.
[2] At the 1964 exchange rate of US$1.00 = 360.00 yen.