

INTERNATIONAL

ICNAF PROPOSES 1973 QUOTA LEVELS

At its 22nd annual meeting, in Washington, D.C., May 25-June 2, 1972, the International Commission for the Northwest Atlantic Fisheries (ICNAF) agreed on the proposed regulation in 1973 through national quota shares of 8 stocks of cod, yellowtail flounder, and hakes of major interest to U.S. fishermen off New England; also, on division of an overall quota for 6 other stocks of cod, American plaice, and yellowtail flounder fished by other nations off Canada.

Scientists are concerned over the condition of cod stocks throughout the Convention Area. They say that almost all are being fished close to the point of maximum yield.

The catch quotas proposed for cod and other species are designed to prevent overfishing.

All member countries were represented: Canada, Denmark, France, W. Germany, Iceland, Italy, Japan, Norway, Poland, Portugal, Romania, Spain, USSR, United Kingdom, and U.S. Observers represented Bulgaria, Cuba, the International Council for the Exploration of the Sea (ICES), FAO, and the International Pacific Halibut Commission (IPHC).

ICNAF, established in 1949, has authority to propose high-seas regulatory measures. These become effective for all member countries that do not object to them.

New ICNAF 1973 Quotas Proposals

	Principal Location of Stock	Overall Quota	U.S. Share
	ICNAF Division ^{1/}		
Cod	2J, 3K, 3L	575,500	
Cod	3PS	50,500	
Cod	3N, 3O	103,500	
Cod	4VS, 4W	60,500	1,050
Cod	5Y	10,000	9,400
Cod	5Z	35,000	19,600
American Plaice	3L, 3N, 3O	60,000	100
Yellowtail Flounder	3L, 3N, 3O	50,000	100
Yellowtail Flounder	Subarea 5, E. 69° W.	16,000	15,000
Yellowtail Flounder	Subarea 5, W. 69° W.	10,000	9,000
Silver Hake	5Y	10,000	9,500
Silver Hake	5ZE	80,000	17,000
Silver Hake	5ZW	80,000	25,000
Red Hake	5ZW	40,000	15,000

^{1/} The ICNAF Convention is divided into 5 Subareas, encompassing waters off: West Greenland--Subarea 1; Labrador--Subarea 2; Newfoundland--Subarea 3; Nova Scotia--Subarea 4; and New England--Subarea 5. Each Subarea is divided further into Divisions with alphabetical designations. In Subarea 5, these include Division 5Y (Gulf of Maine); 5ZE (Georges Bank) and 5ZW (Southern New England).

How Quotas Were Determined

National quota shares generally were determined by a formula that allocated 80% of the quota on the basis of historical performance in the fishery. Equal weight was given to 10-year long-term and 3-year short-term periods; the remainder was divided between a preference for coastal countries and an allowance for miscellaneous factors, such as new entrants into the fishery and the catch of nonmember nations.

The Commission recommended continuation in 1973 of overall haddock catch quotas of 6,000 tons in Subarea 5, 9,000 tons in Division 4x, and 4,000 tons in Division 4w. In this case, members felt the quotas were too small to justify formal allocation. However, the Commission noted that only the U.S. and Canada planned a directed fishery for haddock. Also, a small portion of the existing area off Massachusetts closed during March, April, and May to vessels capable of catching bottomfish such as haddock was reopened to avoid interference with other fisheries.

The Hakes

In addition to national quotas for red hake and silver hake, the Commission agreed to continue a seasonal ban on fishing for hakes in that part of Subarea 5 south of Nantucket Island bounded by 69°W., 39°50' N, 71°40' W., and 40°20' N. In 1973, however, this closure is to apply during April rather than January-March as in previous 3 years. April is one of principal periods when hake concentrate offshore in prespawning aggregations before moving to inshore waters where U.S. fishermen operate.

Georges Bank Scallop

Members agreed on the regulation of the U.S.-Canadian Georges Bank scallop fishery. Scientists have warned that scallops are being harvested at sizes that do not permit the maximum potential yield. The proposed recommendation provides for a minimum shell size (95 mm) and minimum average meat weight (11.3 grams) for all scallops harvested.

Mesh Size Increased

The Commission also recommended to increase mesh size requirements of the applicable trawl regulations in Subareas 4 and 5 to 130 mm or 5 $\frac{1}{8}$ inches (manila) in the cod-ends of nets. Existing mesh requirements of 114 mm, or 4 $\frac{1}{2}$ inches, would continue in other parts of net. New mesh requirements in codend would become effective Jan. 1, 1974, except in Division 4x, where date will be determined at 1973 Annual ICNAF Meeting. (Trawl regulations apply in Subarea 5 for cod, haddock, and yellowtail flounder; in Subarea 4 for cod, haddock, witch, yellowtail flounder, winter flounder, and American plaice.) In ICNAF Subareas 1, 2, and 3, 130 mm mesh requirements for regulated species are in effect.

Atlantic Salmon Agreement

The Commission voted to incorporate in an ICNAF proposal the substance of a U.S.-Danish agreement on Atlantic salmon concluded Feb. 5, 1972. It provides for a complete phase-out of the high-seas fishery for this species over 1972-75; the catch by local Greenland fishermen will be held at 1964-71 average.

OECD FISH CATCH ROSE SLIGHTLY IN 1971

In 1971, the 19 member nations of the Organization for Economic Cooperation and Development (OECD) caught about 23 million metric tons, a slight gain over 1970. This is reported in OECD's "Review of Fisheries, 1971". The landings for the food market (nearly 17 million tons) and for industrial purposes (6 million tons) were about the same.

The 202-page report covers major fishery developments. It provides information on production, fleets, marketing, external trade, and government assistance.

The stocks in most main fisheries were reported less plentiful. Measured by the effort applied, the catch rate often was below 1970's. So fleets were redeployed from one fishing area to another, or from one species to another.

Cod

The fishery for spawning cod in North Norway rose 50%. The plaice fisheries in the Barents Sea cod fishery declined sharply; more effort was applied by some fleets to grounds around Iceland.

For many countries, shellfish continued to be a major source of revenue. More effort was concentrated on catching crustaceans and molluscs.

Rising Costs

Rising operational costs were offset, to some extent, by higher product prices. The very good 1970 production record set by fish meal and oil in the North East Atlantic was exceeded in 1971 in Denmark and Norway. However, fishermen supplying the reduction factories received lower prices than in 1970.

The prospect for any significant addition to present supply levels are not good. Landings are not higher than 1971 levels, so, to meet demand, OECD countries are looking outward for fishable stocks and for more supplies from developing countries.

Trade Trend Continues Upward

The trade in fishery products has been upward for many years and 1971 was no exception. The value of OECD imports will exceed \$2.5 billion, up 7% from 1970. Exports will approach \$1.9 billion, up 12%. The higher values of foreign trade were due mainly to increasing prices.

The import trade continues to be dominated by the U.S., the United Kingdom, Japan, and France; these took 72% of all imports. Japan, a leading exporter, is followed by Norway, Canada, and Denmark; Japan exported about two-thirds of total OECD exports.



UNITED KINGDOM 1971 CATCH STEADY, VALUE UP

Landings in the United Kingdom during 1971 were at 1970 level, but value rose nearly 24%. Demersal species declined slightly, but total value rose due mainly to a large rise in landed value of cod and haddock. Decreased cod landings from distant-water operations were offset somewhat by increased landings of haddock and whiting. Landings of pelagic species rose 7% above 1970. This was attributable mainly to greater landings of sprats.

A decline in England's herring landings was compensated for by increased Scottish landings from the west coast of Scotland and Shetland. Shellfish landings remained at about 1970 level, while total value rose nearly 16%.

In Distant Waters

Catch rates on some distant-water grounds fell significantly from 1970. Yields from near and inshore waters remained generally satisfactory.

Vessel operations in distant-water areas traditionally include Bear Island, Spitzbergen, Norwegian coast, Iceland, East Greenland, and the Northwest Atlantic. The distant-water fleet, including freezer vessels, operated mainly in the Barents Sea, and on the grounds off Norway and Iceland.

In 1971, the UK banned herring fishing in North Sea and Skagerrak, except under license during May, and from August 20 to September

30. Effective Nov. 15, 1971, a ban was imposed on purse-seining for herring in an area south of Ireland.

Changes in Fleet

The trend in fleet composition in recent years has been a decrease in number of deep-sea "conventional" trawlers, a steady increase in inshore vessels, and a gradual increase in freezer trawlers.

In 1969-1970, construction of deep-sea vessels remained low. Only 5 new vessels were added.

The total inshore fleet (40-79 ft.) increased to 1,643 vessels by 1971, the near water fleet (80-109 ft.) declined to 176 vessels, and middle water fleet (110-139 ft.) dropped slightly to 174 vessels. Near waters are those along coast of UK, Scotland, and North Sea. In 1970 and 1971, the fishing effort continued concentrated in North East Atlantic. Distant-water wetfish vessels 140 ft. and over totaled 126 by 1971; also, there were 36-freezer-factory vessels.

Plans include construction of two fillet-freezing stern trawlers (248 ft.) to be completed in 1972. This would bring to 8 the number being built or on order in the U.K. Four 213-foot vessels also were under construction in 1971. Two 197-foot vessels were being built in Norway to operate from U.K. ports in early 1972.



The 240-foot, all-freeze, over-the-stern-part factory trawler. Owned by Britain's Boston Deep Sea Fisheries Ltd.

THE OCEAN--A SOURCE OF TASTY FOODS

Sergei Snegov

The Central Scientific Research Institute of Information and Technico-Economical Studies in Fisheries has a laboratory that will interest even the layman. A team working under Lidia Borisochkina, Cand. Sc. (Technology), is studying the techniques for processing fish and other sea products. Every buyer of sea foods in the shops becomes acquainted with the work of this team.

What is fish like? It is a tasty dish. Fried fish, boiled fish, smoked and dry-cured. There is a lot more to know about it. However, the chemist will kill the gourmandise by saying:

"Fish flesh contains nitrogenous extractive (soluble) compounds. It is they that give taste and aroma to the dish that stimulate the excretion of gastric juices and improve the appetite."

It is wholesome. It contains all the essential substances needed for the vital activity of the human body. Proteins. Some pelagic fish that inhabit the surface layers (not the bottom-dwelling fish) have 22-24% protein content. More than the freshwater fish. Fish flesh offers all necessary amino acids, just like the flesh of domestic animals. Edible fish oil, as distinguished from the fats of birds and animals, is characterized by a liquid state at room temperature. Therefore, it is easier to assimilate. Besides, it includes a whole complex of unsaturated fatty acids, such as linoleic, linolenic and arachidic acid--so-called vitamin F, known for its anti-sclerotic properties.

The Universal Pharmacist

The word "medicinal" has suggested itself. Fish can be a real medicine. Fish, crustaceans, molluscs, and seaweed are stores of vitamins A, D, and B-group. They get it from the ocean--the universal pharmacist. No other foods in the human diet contain such a collection of mineral elements that play an important physiological role. Fish contains iodine, manganese, copper, bromine, fluoride, cobalt, potassium, calcium, magnesium, and phosphorus.

For instance, cod fillet contains iodine in a proportion of 800 to one, or even 2400 to one, as compared to beef. UNESCO experts maintain that two of three diseases, including goiter, which have afflicted 200 million people, should be treated with different foods obtained from the sea.

Preserving Fish Properties

Fishermen catch fish several thousand miles from home. To preserve the splendid properties, a variety of techniques is used.

Freezing above all. It appears simple enough: freeze the fish and it will be preserved. But it is far more difficult, really. No cooling improves the properties of sea foods. The problem is to select conditions which would reduce the losses to a minimum. Besides, fish loses 4 to 6% in weight if temperature in freezing chamber is lowered by forced circulation of cold air. The freezing rate is also important. The quicker the freeze, the smaller the quantity of protein affected by irreversible transformation. Preserving the catch depends on many factors, even on the mechanical characteristics of ice. Chipped ice, for instance, can damage the fish. The use of lamellar ice out of snow offers the best possibilities.

In the past, fish was frozen and preserved at a temperature of minus 6-10° Centigrade. Today, the practice is to maintain the air temperature at minus 30-40° and the temperature of the fish at not higher than 18°. A most promising quick deep-freeze technique is the liquid nitrogen method. It is used for the more expensive products, such as shrimps, lobsters, spiny lobsters, and ready-made foods. This technique forms tiny ice crystals

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in the tissue, the juice remaining in the flesh. After the foods are unfrozen, they meet the most exacting requirements of the strictest tasters. The gastronomical properties of the food suffer no loss at all.

Augmenting Freezing Process

To augment freezing, experts sometimes resort to "exotic" substances, such as bee glue--propolis. It consists of resins (more than half the content), wax, and fragrant essential oils. It is characterized by anti-oxidizing properties. Sturgeon, white salmon, and muksun salmon are washed in a solution of propolis and then frozen. After that, they are glazed in a mixture of bee glue and citric acid. After 10 months' storage at minus 20-25 degrees Centigrade, the fish's nutritive and gustatory values are fully preserved.

The problem of quick defreezing is not easy either. Numerous techniques have been tried. For instance, fillet layers have been "thawed out" in vacuum chambers with steam. Good results have been produced by experiments in defreezing sprats with commercial frequency current. These experiments were conducted by the All-Union Scientific Research Institute of Fisheries and Oceanography.

The prospect of removing the elaborate and costly refrigerating plants from the ships and shore storage centers is highly tempting indeed. What "force" can oppose the destructive effect of the microorganisms, oxidation of fats, and decomposition of proteins? The scientists are searching for fundamentally new means and techniques.

Radiation As Preservative?

Is radiation harmless as a preservation agent? For 20 years, researchers have tried to find an affirmative answer. Ionizing radiation inhibits the vital activity of microorganisms. But the effect of gamma, beta, and X-ray radiation and of accelerated electrons is complicated. They alter the nutritive value of the product. After certain radiation doses, so-called induced radiation occurs in it. It is necessary to establish whether it is toxic or carcinogenic or not. The microbes "die but do not surrender". Radiation may work mutation changes in them.

For more than a year, the Institute of Nutrition, USSR Academy of Medical Sciences, has been conducting an experiment in feeding white rats with fresh cod fillet subjected to gamma radiation. This ration has not produced any toxic effect on three generations of rats. However, it has been found that certain unfavorable changes have been worked in their metabolism. The sickness rate and mortality of young rats of the first and second generations is somewhat higher.

The preliminary conclusion is: radiation is an effective means for the preservation of fish foods from being spoiled. However, the scientists have not established the ultimate consequences arising from the use of irradiated fish for food. Therefore, they cannot recommend it for the table.

Experiments have followed experiments. Some have produced hopeful results. In the USSR, it has been permitted to treat some vegetable foods with radiation. Gamma radiation has been used to extend in considerable measure the storage period of potatoes, grain, and dried fruits.

When Is Fish 'Ripe'?

When is fish considered "ripe?" The food experts must know this for they need "raw material" of a definite quality. It is a fact that the chemical composition of the different fish species (mature fish, of course, not young fish) varies during the year. For instance, the fillet and liver of cod caught in the Baltic between August and February are of a much higher value than those taken in other months. Fish gains a lot of fat before the spawning season.

Atlantic herring is particularly good and suitable for processing in June, when it has fattened generously. As it matures in salting, as the process experts say, enzyme activity (enzymes are substances excreted in gastrointestinal tract) plays a special role. Thus, herring caught in June takes only one fifth the time for salting compared to herring taken in November, when fish completes its preparation for winter.

These factors are taken into account when tinned crab flesh is made. Meat taken from crabs with a hard shell is more useful and tasty than meat taken from crabs that have just changed their "armor".

Shark As Delicacy

Balyk of shark on blubber. This recipe for a tasty smoked delicacy of high nutritive value is not the product of refined gustatory fancy. It has been "designed" for two reasons: 1) The supply of those fish species to which we have long been accustomed is limited. The fishing industry is thus forced to catch other species. Most of these are oceanic fish, including shark--mako shark, grey shark, and mackerel shark, 10 species or so. 2) Should we refuse to take shark flesh, which is rich in protein and other useful substances, only because it is shark flesh? Of course, not. That would be uneconomical.

Now balyk out of shark. It looks just as tempting as smoked nototenia. It is just as tasty too. But the somewhat dry flesh of the sea robber has to be treated with up to 6% of anchovy fat or blubber. The fat has to be uniformly distributed in the cured flesh, which retains it; the fat is not subject to oxidation in the course of several months. The experimenters have developed a technique for making balyks out of cartilaginous fish that lends itself to mechanization.

Krill Added to Food

Here is a graphic illustration of a rational approach to utilization of ocean resources--the taking and processing of krill. Krill is a very small crustacean that is part of zooplankton. The food industry has been putting out so-called Korall cheese and other foods with an addition of krill paste. These foods are highly nutritive and characterized by a specific "sea" taste. The same is true of canned scallops, sea clams, and laminaria (sea kale or cabbage). The Soviet food industries produce more than 600 types of canned sea foods. The assortment has been increasing every year because more and more denizens of the sea and plants are now being used.

Fish is meat. It is also milk and poultry. It is in a sense. For meal made out of "waste" products from fish processing and canning, or from lower grades of fish, can be translated into fatter herds, additional tons of milk and eggs from record laying hens. It has been found that livestock and poultry are able to assimilate 85-90% of the protein contained in fish meal, and only 30-40% of that contained in vegetable folder.

Floating fishmeal factories are plying the northern seas. Thousands of tons of Caspian sprats are being turned into fodder additions characterized by a high caloric value, vitamin and mineral substance content.

Protein Shortage

According to United Nations, more than half the population of the planet now suffers from a shortage of protein in the diet. It has been calculated that the ocean is capable of supplying four-fifths of animal protein, not one-fourth as today. Several hundred researchers of many countries are now tackling the problem of saving humanity from protein deficiency.

Fish protein concentrate (FPC) is one of the solutions to this problem. The "extract" should contain a dozen or more essential amino acids. It should be totally free of fish smell. It should be soluble in water. What is most important, it should be cheap. Soviet researchers at the Technological Institute of Fisheries in Astrakhan (delta of the Volga) have developed a process which ensures the above properties.

The food concentrate produced there is free of fat, the main source of the specific fish smell. Even after prolonged storage, the "smell of sprat" is not restored. When dissolved in water, the concentrate is characterized by froth-forming power. This is essential for the bread-baking industry. The "Kaspiiski" oblong loaf and the "Snetok" roll enriched with protein have proved a success. A 2% addition of the concentrate has increased the lysine (a vital amino acid) content by 58%, vitamin B₁ by 69%, calcium by nearly 40% and iron by 64%. At the same time, the price has gone up negligibly.

They say that the fish protein concentrate has a splendid future. Experts maintain that it will increase the caloric value of bread and confectionery, including biscuits and creams. More than that, it may even replace milk and cream in ice cream. FPC will be added to soft drinks.

Neptune is not in a hurry to open the doors of his store rooms to man. But he is a good host to guests who are ingenious and thrifty.

MEXICO STARTS NEW PROGRAM TO TRAIN FISHERMEN

Mexico is initiating a program in September 1972 to train young men to be fishermen. It is part of an overall plan to fully develop marine resources. Conducted by the Ministry of Public Education, the program is headed by Dr. Jorge Carranza Fraser, Director General for Fishery Technology Training.

Thirty high schools (the secundaria level) are involved. Most of them are on both coasts, and two in inland areas are concerned with fresh-water fisheries. The program has US \$1.76 million for 1972 and US\$5.6 million for 1973. Each school will accommodate 60 students, a total of 1800.

The Curriculum

Although the 3-year secundaria course includes normal high-school subjects, the emphasis is on fishery subjects. These include gear and methods, fishery planning and development, technology of processing and handling, aquaculture, boat handling, piloting, engine operation and maintenance, and basic electronics.

Following these 3 years, students who decide to continue into a fishery career (it

is not mandatory) will advance to higher levels including refrigeration, more electronics, and fishery research. This preparatoria level will last 3 years. Provision is made for college level and graduate work at several universities.

Several of the schools will board students at government expense. Student selection will be competitive. Fellowships will support 60% of students at day schools. This recognizes the relatively low income of coastal-town families.

Program Aids Industry

At present, there are 5 fishermen training centers in Mexico. Their achievements in terms of permanent entrants into the fishing industry have not been satisfactory. The new program is a determined approach toward injecting substantial numbers of young, motivated, and qualified fishermen into the fishing industry; it is designed to help achieve the administration's announced goal of doubling fish production by the end of 1976. (Reg. Fish. Att. U.S. Embassy, Mexico, June 22.)

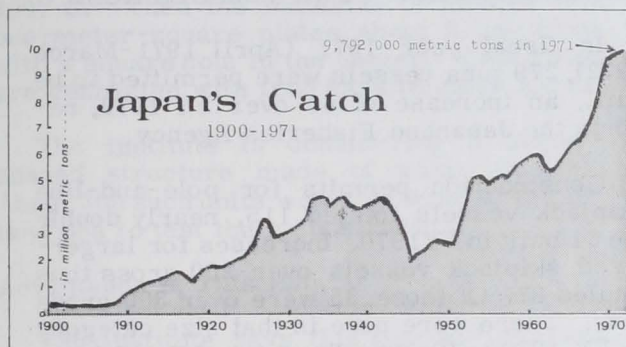


ASIA

JAPAN

JAPAN'S 1971 CATCH TOPS 9.7 MILLION METRIC TONS

Fishery production in 1971 totaled 9,792,000 metric tons, a new record, Japan's Ministry of Agriculture and Forestry has announced. This was roughly 5% over 1970's 9,272,000 tons.



Type of Fishery	1969	1970	1971
	1,000 metric tons		

MARINE FISHERIES:

Distant water	3,165	3,441	3,608
Offshore	2,948	3,234	3,512
Coastal	1,863	1,918	1,929
Sub Total	7,976	8,593	9,049
Shallow sea culture	473	515	575
Total	8,449	9,108	9,624

INLAND FISHERIES:

Fisheries	112	-	-
Aquaculture	52	-	-
Total	164	164	168
Grand Total	8,613	9,272	9,792

Source: Suisan Tsushin, May 27, 1972.

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NMFS AGENT BOARDS JAPANESE CRAB FACTORYSHIP OFF ALASKA

On May 10, 1972, Phil Chitwood, NMFS Enforcement and Surveillance Agent, Alaska Region, boarded the Japanese crab factoryship 'Keiko Maru' 48 miles north of Amak Island in eastern Bering Sea. He reported the vessel is 444 feet long and weighs 7,516 gross tons. She carries 454 men; her fleet

of catcher vessels is manned by 261 men. She fishes with 18 catcher vessels ("dok-kosen") and two "kawasaki" boats used to shuttle between catcher vessels and mother-ship. Every 7-10 days, a cargo ship re-provisions the fleet and transports processed crab back to Japan.

The vessel departed Tokyo, her home port, March 1, 1972, began crabbing on March 13th, and is scheduled to return home on October 5th.

Production Below Normal

As of May 10, the Keiko Maru had processed 5,185 cases of king crab and 1,758,170 individual tanner crabs; her quota for 1972 is 19,148 cases (440,000 individual crabs) of king crab and 7,460,000 tanner crabs. Daily production was running at 98 cases of king crab and 38,661 individual tanner crabs, which is below normal. Officials explained that their operations through May 6 had been hampered by severe ice conditions and the loss of many crab pots because of ice earlier in the season. They reported concentrating on tanner crabs because of poor king crab catches this year.

Fishing Only Pots

So far this year, the fleet has fished only with pots on a line 3,200 meters long with a pot every 25 meters. Normally the vessel anchors and her catcher boats fish within a 30-mile radius of her position. They concentrate on one area for about 10 days before shifting to a new position.

The crabs are taken aboard factoryship in slings (each holds 230 tanner crabs) and are unloaded on main deck aft of deck house. The crabs to be frozen--all tanner and some king--are first sectioned and then transported forward by a conveyor belt. There they are cooked in salt water for 18 minutes. Then they are cooled in salt water for 5 to 10 minutes and sent below decks for wrapping and freezing. The meat from the king crab, which are to be canned, is reportedly extracted by hand. The processing facilities are run 24 hours a day, if necessary, 7 days a week. Each crew member works 8 hours a day, 7 days a week.

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JAPAN (Contd.):

230 TUNA LONGLINERS IN ACTION

Toward the end of July, about 230 Japanese longline vessels, home-ported at Yaizu and Misaki, were fishing for tuna in the Atlantic, Indian, and Pacific oceans.

In the Atlantic, the fleet numbered about 50. Twenty of these were fishing off Dakar, Senegal, primarily for bigeye tuna. Catch per vessel was about 1.5 tons per day of fishing.

In the Gulf of Mexico, 10 longliners were fishing for yellowfin; each vessel was averaging about 1.7 tons per day.

In the northwestern Atlantic east of New York, 6 longliners were fishing for albacore and bigeye. Catch per day was a ton a vessel.

East of Cuba, 5 vessels were taking albacore primarily at the rate of 1.2 tons per vessel per day.

Off Montevideo, Uruguay, 6 longliners were catching albacore and bigeye. Each was landing about 1.8 tons a day.

In Indian Ocean

In the Indian Ocean, 11 vessels were scattered. Off Cape Town, South Africa, 3 were fishing for yellowfin mixed with bigeye; the catch per vessel was averaging 1.4 tons a day. West of Java, each of 3 vessels was averaging about 1 ton per day of mixed bigeye and yellowfin. Near 30° S. and 80° E., 5 longliners were fishing for albacore and each was averaging 1 ton per day.

The Pacific

About 170 longliners were deployed in the Pacific. About 90 were fishing over a wide area between 0°-15° N. and 150°-170° W. (south of Hawaiian Islands). They were landing mixed catches of bigeye and yellowfin at the rate of 1.8 tons per vessel per day. Around the Galapagos Island, 12 were fishing for bigeye; each vessel was landing about 1.5 tons a day. In the southwest Pacific, 10 were fishing for yellowfin off the Solomon Islands, each landing 1 ton a day. In the region of 0°-10° S. and 100°-140° E. (around Indonesia and New Guinea), about 30 longliners were fishing for bigeye. The catch per vessel was about 2 tons a day, and as much as 3 tons for

high vessels. Four longliners were working east of New Zealand. Five in the Tasman Sea off Sidney, Australia, were fishing for southern bluefin; catches per vessel were averaging 1.7 and 1.5 tons a day. ('Katsuo-maguro Tsushin', July 20.)

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1971 CONSTRUCTION PERMITS FOR
LARGE SKIPJACK TUNA VESSELS ROSE

In fiscal year 1971 (April 1971-March 1972), 279 tuna vessels were permitted to be built, an increase of 60 over FY 1970, reports the Japanese Fisheries Agency.

Construction permits for pole-and-line skipjack vessels totaled 115, nearly double the 64 built in FY 1970. Increases for larger-sized skipjack vessels over 200 gross tons totaled 87. Of those, 35 were over 300 gross tons. There were none in that size category in FY 1970. ('Suisan Tsushin', July 10.)

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NIHON SUISAN PLANS COMPUTERS
TO SPEED FISHING OPERATIONS

Nihon Suisan, a leading Japanese fishery firm, has developed a "fishery and sea condition data retrieval system," first of its kind.

The company expects the system to provide high-speed answers to questions about oceanographic, meteorologic, and fishing conditions in any ocean.

Its motherships will radio questions regarding a particular location to the land-based Matsudo station for transmission to its Tokyo office. Its computer will answer the questions and relay these through Matsudo to the fleet.

To Speed Data Retrieval

The entire process is expected to take 15 to 20 minutes. About 20 kinds of inquiry forms will be prearranged, including data on water temperatures, salinity, sea currents, fish hauls, and weather. The new system will speed by several hundred times the present data-retrieval system, which uses technicians aboard the mothership. Already, the system has proved its worth aboard the company's whaling motherships in the Arctic and Antarctic. ('Japan Economic Journal', July 4.)

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JAPAN (Contd.):

PLASTIC FISH HABITATS DEVELOPED

The Plastic Waste Management Institute, formed by 35 petrochemical industrial firms, has made from waste plastics an artificial habitat for fish.

The fish home is made by melting a mixture of plastic wastes and sand at about 200° C. Then the material is molded into one-meter-square plates about 5 cm. thick with a square hole in the center. Two plates are connected with iron bars to make a unit.

The institute is considering a lattice-shaped structure made of waste plastics. About 300 such units would be sunk in the Inland Sea to test their construction.

Advantages of This Habitat

The institute says this type of fish home does not contaminate the sea. It is semi-permanent (in contrast to buses, cars), cheaper than concrete cubes, and solves problem of plastic waste disposal. ('Japan Times', June 27.)

NMFS COMMENT: Experiments on artificial habitats in the U.S. have shown remarkable success. Great numbers of fish are attracted to these homes where, previously, the waters were sparsely populated. However, U.S. experiments have been troubled by deterioration of such objects as cars and buses and/or high costs of longer-lasting concrete structures.

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ABALONE CULTURE

The Japanese cultivate abalone artificially, states "Australian Fisheries". Usually, the parent abalone are induced to spawn in mid-autumn by exposing them to air for a short time. Then they are placed in water a few degrees above or below seawater temperatures.

Vinyl plates are used as a home for the young abalone. These plates usually are left in seawater and accumulate a growth of microalgae used as food by the new abalone. Later, as the juveniles grow, they are fed with larger algae, such as *Undaria* sp., *Laminera* sp., and *Ulva* sp.

A year after fertilization, they reach about 20 mm. in shell length. Then, they are either sold to fishermen or released into unproductive areas of the sea around Japan. Within a few years, they reach marketable sizes and can be reharvested and sold.

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SUMMER ALBACORE LANDINGS NEAR RECORD

Japanese summer albacore landings for April-late June 1972 reached 45,000 metric tons. They approached the record seasonal catch of nearly 50,000 tons in 1971.

This year's monthly landings began at about 2,000 tons in April, rose to 18,000 tons in May, and jumped to 25,000 tons in June. Thereafter, catches began tapering off in the offshore waters. This indicated approach of season's end.

The size of albacore this year is very small. It averages 7-8 kilograms (15.4-17.6 pounds) per fish. As a result, meat recovery for canning is very poor.

Cold Storage Operators Active

The summer landings were being purchased heavily by cold storage operators. They obtained an estimated 40% of the catch for export. Frozen albacore export prices continue upward. At the end of June, they were reported to be around c. and f. US\$850 a short ton for delivery to California. Because of rising prices, the packers in Japan were having difficulty competing for supply with cold storage operators. ('Suisan Tsushin', June 27.)

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PAY \$1,000 MORE FOR TON OF SHRIMP IN EARLY 1972

Japanese importers paid an average US\$1,000 more per metric ton of frozen shrimp (about \$0.45 more per pound) than they did in 1971.

The average import price of frozen shrimp from all countries has increased steadily in the past decade. In 1961, it was \$1,682 per ton; by 1971, \$2,583 (\$1.17/lb). During Jan.-April 1972, it averaged \$3,500 per ton (\$1.59/lb), up \$1,000 a ton over 1971.

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JAPAN (Contd.):

TRAWLING OFF NEW ZEALAND IS LESS SUCCESSFUL

The "larder of plenty" for Japanese trawlers off New Zealand may not last much longer, reported the "Post Wellington" on June 7. In 1970, 8 trawlers harvested about 30,000 metric tons; 2,800 New Zealand vessels took 40,000 tons.

Five years ago, hauls of 30 tons or more were commonplace; today are a rarity. The Japanese soon may have to look elsewhere for new stocks of fish to replace their diminishing catches. Roughly 90% of their catch includes jack mackerel and barracuda, species not eaten in New Zealand.

2 Firms Active

Nippon Suisan operates three 2,500-GRT stern trawlers and one 1,000-GRT side-trawlers. Taiyo Gyogyo operates two 2,000-GRT trawlers year round off New Zealand; two other trawlers of the same size fish half the year.

Fishing Zone Extension Proposed

In late June, the New Zealand Fisheries Development Council proposed extending the 12-mile fishing zone to curb the "increasing rate of exploitation of the New Zealand fisheries area by foreign interests." The Council proposed too that, once fishing limit has been increased from 12 miles, a management zone extending to a least 200 miles offshore should be established. ('Asahi Evening News', June 29.)

日本

INDIA

INDIA'S FISHERIES OFFER INVESTMENT OPPORTUNITIES

India's fishing industry has been given more incentive to develop since it proved able to earn much-needed foreign exchange through increased exports. With a new emphasis on promoting exports of nontraditional products, India today is much more receptive to private foreign investments in deep-sea fishing than ever before.

The production outlook, according to a U.S. Embassy report, is favorable. Exploratory fishing was conducted on east and west coasts, the offshore grounds between 10 and 40 fathoms, excluding areas around Andaman and Laccadive Islands. These grounds are estimated to yield about 595,000 tons of fish and shrimp annually. Of this total, about 448,000 tons will be from Arabian Sea and 147,000 tons from the Bay of Bengal. Productivity studies estimate potential yield of demersal (such as sole) and pelagic fisheries (tuna, sardines, mackerel, white baits, anchovies, etc.) from seas around India up to 100-fathom contour to be about 2,288,000 tons.

Expanded Crustacean Production

Among commercial crustaceans, India will continue to offer expanded production opportunities primarily for shrimp and spiny lobsters. According to Government projections, the eventual export target for shrimp by 1978-79 is US\$110 million; present level is about US\$36 million. India will announce establishment of an autonomous organization, the Marine Products Development Authority (MPDA), to help achieve this target. This agency will assign priorities to the development of India's fishery potential. It will provide necessary operational and infrastructural resources.

Self-Imposed Constraints

There appear to be several self-imposed constraints on development of a modern fishing industry. Most important has been the inability of India's present fleet of about 12 vessels to fish beyond 40 fathoms. To correct this, and to increase production and expand exports, India recently decided to permit import of up to 60 modern trawlers with sensing devices, and processing and freezing equipment. Officials indicate that offshore fishing is now regarded as one of the "top priority" investment areas. India will consider favorably proposals from foreigners to establish joint ventures to develop and boost Indian exports of marine products, primarily shrimp.

SOUTH KOREA

S. KOREAN FISHING INDUSTRY GROWS REMARKABLY

During 1960-1970, S. Korea's fishing industry grew remarkably. Production almost tripled from 347,500 metric tons to 935,000 tons. Under 5-year expansion plan scheduled to start this year, production is expected to reach 1.6 million tons by 1976. Korea hopes to become the fifth largest fishing country; at present, it ranks 17th.

Fishery exports of South Korea scored an impressive 13-fold gain over the past decade. In 1971 alone, fishery exports reportedly reached US\$120 million. This was 9% of the nation's exports of \$1.35 billion.

Fleet Expands

Korea started deep-sea fishing, mostly for tuna, as early as 1956. During the past decade, the combined tonnage of fishing vessels more than tripled--from 107,000 tons in 1969 to 350,000 tons in 1970. By the end of Feb. 1972, the deep-sea fleet had increased to 369 vessels. It included 298 tuna longliners, 60 stern trawlers, and 8 transports. In 1971, longliners caught 117,000 tons of tuna, the third largest catch after Japan and the U.S. Fisheries Director Kim Dong-su is confident about exceeding 300,000 tons in 1976.

At present, Korea has no skipjack pole-and-line vessels. However, a few vessels will fish experimentally for skipjack this year. In time, Korean vessels will fish regularly for skipjack.

Overseas Expansion

Because of this rapid growth, Korea plans to increase its overseas fishing bases. At present, these include American Samoa, Las Palmas, and Tenerife in the Canary Islands (Spanish territory). It has agreed with Uruguay to use Montevideo and other ports as deep-sea fishing bases--and with Peru to use Lima. It is promoting fishery projects with Argentina, Indonesia, Brazil, and others. This includes joint investment projects in offshore and deep-sea fishing and technical tie-ups with its fishing partners. ('The Korea Times', May 7.)

TAIWAN

400 TUNA LONGLINERS ARE IN OPERATION

In mid-July, about 400 Taiwanese longliners (over 50 gross-ton sizes) were engaged in distant-water tuna fishing: about 175 in the Pacific, 122 in the Atlantic, and 98 in the Indian Ocean.

In the Pacific, most of the 175 longliners were off American Samoa. They were catching mostly albacore mixed with yellowfin and bigeye tuna. The catch per vessel was stable at 1 to 1.5 tons a day.

In Atlantic

In the Atlantic, over 90% of the 122 longliners were off Cape Town, South Africa. Their catches were predominantly albacore (about 80% of total) mixed with yellowfin and bigeye. The catch per vessel was running as high as 2.5 tons per day, but the average had declined to 1.3-1.4 tons.

About 98 vessels were in the eastern and western Indian Ocean. South of Madagascar, the catch was mostly albacore; the average was 1.5 tons per vessel per day. Off Jakarta, Indonesia, the catch per day was about 1.5 tons of yellowfin mixed with bigeye. ('Katsuo-maguro Tsushin', July 18.)

ASIAN TUNA CONFERENCE HEARS MANAGEMENT PROBLEMS

The sixth Asian tuna conference was held at Taipei, Taiwan, April 25-27, 1972. Japan, South Korea, and Taiwan were represented.

The delegates reported management problems confront their tuna fisheries. Vessel owners in South Korea and Taiwan are troubled by rising production costs. Because of this, Taiwan's private fishery operators have very little interest in building large tuna vessels; in South Korea, tuna vessels are not being built by existing enterprises.

The net meeting will be held at Seoul, Korea, in June 1973. ('Katsuo-maguro Tsushin', May 2.)

CANADA

BRITISH COLUMBIA TRANSPLANTS SALMON SUCCESSFULLY IN ATLANTIC

The experimental transplant of British Columbia pink salmon to Atlantic waters has been a success, according to Newfoundland Biological Station in St. John's.

A spokesman stated that 468 adult pink salmon, the third natural generation from eggs transplanted in North Harbor, St. Mary's Bay, returned to their natal river to spawn. Besides this run, marine scientists found that 117 pink salmon were caught in the commercial salmon fishery in St. Mary's Bay; 36 were found in rivers other than North Harbor River; 11 were taken in Hawkes Bay on the Great Northern Peninsula; and one other was recorded in the sport salmon fishery.

Canadian scientists reportedly are convinced that the pink salmon is definitely established in Atlantic waters. ('Canadian Fishermen', April 1972.)



SOUTH PACIFIC

AUSTRALIA

INVESTMENT PROSPECTS IN AUSTRALIA

About 20% of Australia's fishing industry is controlled by foreign interests, states a report by the U.S. Embassy on the investment climate in this industry. At present, U.S. private investment is exceeded only by Japanese. Kraft Foods Ltd. is the largest U.S. subsidiary participating in Australia's fisheries.

The prospects for future U.S. investment appear "mixed". Fishermen normally obtain both State and Commonwealth licenses. No new licenses are being issued for three types of "restricted fisheries"--abalone, rock lobster and scallops. Also, local interests have pressured the authorities not to allow any new "joint ventures." These are defined as enterprises employing foreign-owned

boats and/or foreign crews. On the other hand, Australia continues to welcome foreign capital.

Issue Being Debated

The whole issue of foreign investment is being widely debated during this federal election year. While the fishery industry has not been singled out, many political figures, particularly in the opposition Labor Party, are calling for greater local equity in any new ventures.

Prospects for shrimp, rock lobster, scallops, abalone, and other desirable species appear generally good. Increased production and exports of shrimp seem especially promising.

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U.S. AUSTRALIAN & JAPANESE PEARL VENTURE PROFITABLE

For the past 10 years, Pearls Pty., Ltd., a joint U.S.-Australian-Japanese venture, has profited in the culture and sale of pearls.

In 1971, the company sold 178,000 grams of cultured pearls (about 80,000 of them) worth US\$3.6 million. The pearls, marketed by the Japanese partner, range in value from \$4.20 to \$2,520 a piece.

Oyster Farms

The pearls are grown on oyster farms at Kuri Bay and Thursday Island (northwestern Australia) and at Port Morseby (New Guinea). The Kuri Bay harvest is gathered from 120 hectares (about 296 acres) of water. This "farm" is seeded with 350,000 to 400,000 oysters. Another 160,000 are added every year as the oysters planted two years earlier are harvested. Twenty-six Japanese technicians are employed. ('Asahi Evening News', June 27.)



AFRICA

NEW GEAR SPEEDS SOUTH AFRICAN LOBSTER FISHERY

For many years, South African fishermen hauled in their lobster pots, emptied catch on deck, and later sorted it by hand. Many under- or near-legal-sized lobsters were damaged (broken claws, shells). Near-legal-sized lobsters also suffered greater exposure because they were the last to be sorted, measured, and released. About 50 million rock lobsters are examined each year only to be released because they are below legal size. This is time-consuming, expensive, and harmful to the smaller lobsters.

New Approach

The S.A. Sea Products Co., Hout Bay, South Africa, has developed a new approach. It has installed a "sorting grid" aboard its lobster vessels. This grid is used with special "escape" pots, which allow smaller lobsters to escape underwater, and has increased production appreciably.

The sorting grid is made of steel bars spaced 2 inches apart. It is mounted on the deck near the gunwale. A chute runs from the grid, through a hole cut in the gunwale rails, so undersized lobsters, falling through the grid, drop into the sea. The pots are unloaded into the grid.

An average 50-60% of lobsters in each pot escaped untouched through the grid; all were undersized. Between 2 and 4% of lobsters that remained were found later to be below legal size. In most instances, the process only took a few seconds.

Conservation

Through the use of special "escape" pots and sorting grids, lobster fishermen have aided conservation of lobster resources and speeded production. Fishermen no longer have to separate hundreds of undersized lobsters because it is done almost automatically. Fishermen using the grid can devote more time to ensuring freshness and quality of their legal-sized lobsters and increase fishing time. ('The South African Shipping News and Fishing Industry Review', Jan. 1972.)

CAMEROON FISHING INDUSTRY

Cameroon's fishing industry is largely a canoe fishery. In 1970, its catch was 70,800 metric tons (65,500 in 1969), mostly freshwater fish. Production has increased steadily since 1965. The shrimp fishery has grown most.

Cameroon has about 186 miles of coastline. Its continental shelf is up to 25 miles wide in the north and 15-20 miles in the south. Fishery resources on the shelf appear limited, except for shrimp. Sardinella, seabream, and tuna are found in adjacent waters and are fished commercially.

3 Types of Fisheries

There are 3 types of fisheries:

(1) Inland: This is most important, but it is canoe fishery and underdeveloped. The annual estimated catch is about 75% of total landings.

(2) Coastal: Fishing is conducted by an estimated 1,500 to 3,000 unpowered canoes. The catch is about 15,000 tons.

(3) Modern: Most vessels are in shrimp-ing. They include 8 shrimp trawlers, 3 stern trawlers, 2 freezer trawlers, and 12-15 wooden, side-trawlers. Two Japanese shrimp trawlers joined the fleet in 1970-71 and the Cameroons eventually will buy these. The 1968 catch of the modern fishery was estimated at 15,000 tons.

5 Fishing Firms

There are 5 fishing companies. The two most important are: (1) SIPEC, a joint venture of the Cameroons, Spain, the Netherlands and, more recently, Japan. The company operates a modern 1,500-ton cold-storage plant, refrigerated freight cars and trucks, and 3 freezer trawlers. It was expected to buy two used Japanese 300-GRT shrimp trawlers. (2) SOPECOBA (or Crevettes du Cameroun), a joint venture established in 1968 of Cameroons and the U.S. firm, Gorton's of Gloucester. SOPECOBA has 8 steel shrimp trawlers and a freezing and packing facility at Port Douala; its shrimp exports to the U.S. topped \$1 million in 1969.