# Mexico's fisheries

To talk about fisheries is to talk about life, food, hu man and his environment, fishermen and their communities; about an essential part of Mexico. In a short time, Mexico has become a middle level power in world fisheries. Its abundant natural resources, the capability and experience of its human resources, as well as the vigor injected into the sector by the state, have brought about this achievement.

Within the framework of fisheries modernization begun by President Salinas de Gortari, Mexico seeks self-sufficiency in the capture and distribution of diverse species. Its aim is to strengthen national sovereignty within an exclusive zone, thereby maintaining absolute control over Mexico's resources.

Mexico's exploitation of its marine resources is based on a policy of protecting species, as well as on rational and careful administration that supports and promotes fisheries. This has been widely acclaimed in scientific and legal forums both at home and abroad. In recognition of the foregoing, Mexico was elected, in April 1991 in Rome, to the Chair of the Fisheries Committee of the Food and Agriculture Organization (FAO).

The history of fishing in Mexico is part of the conscience of its inhabitants and of its enormous and varied marine wealth, which stretches along 11,500 kilometers of coastline. In ancient times, the original inhabitants of Mexico, particularly coastal dwellers, devoted themselves to fishing, as did inland indigenous communities close to rivers and lakes. It should be remembered that the Aztec plateau was a vast lake region abounding in such fresh-water fish as the *juil* (*Algansea tincella*) and *itzatacmichin*, a white fish of which there were three species. At the time, the native Mexicans fished the lakes in boats, using hand nets, spears, as well as fishing poles and line.

Tadeo Ortiz de Ayala, who set out to explore the Coatzacoalcos region in 1824, wrote that the region stretching from ocean to gulf was not only blessed with an accessible coastline, but possessed by 26 rivers, the largest being the Coatzacoalcos. In addition to its agricultural wealth, he noted its abundant fish:

*In the big creeks of certain depth, such as the Colorado, the Rabón, the Prieto and the Tortuguero which we have explored and which flow into the sea between the Coatzacoalcos and Toneladas rivers, and the big stream and the Cuatajapa which flow into the Coatzacoalcos, there are considerable fish of all types, shrimp, crab, crayfish and turtles, just as in the lagoons...The Santa Ana River flows in the right direction and carries little water, and since it is too wide, it is not very deep, ending in a beautiful lake, that produces such a prodigious amount of oysters that they even form banks.*

Here is an image...contemplated by a Mexican participating, in his own enthusiastic way, in the start of a transcendental period in the development of a liberated nation. That geography was lost in modern times, devoured by oil wealth and the petrochemical industry.

On November 20, 1829, the government expressed interest in developing fishing and navigation, and issued provisions applying the 1820 Decree of the Spanish parliament. Outstanding was the concept of promoting fisheries as a basis for employing the coastal population.

From that moment on, Mexicans from the coast as well as the central highlands became increasingly conscious of fisheries, even though mining and agriculture absorbed greater interest and effort. Furthermore, fishing appeared to be an efficient means to improve the livelihood of certain indigenous communities.

The utilization of plains and valleys, mountains and hillsides, rivers and lakes, coast and sea was a wish for economic integration. But such objectives could not be thoroughly planned for political reasons and the lack of financial resources.

The earliest fisheries regulations were issued in 1872. They stipulated that fishing, pearl diving and the utilization of all maritime products were to be free for all the nation's inhabitants. Duties were mentioned for both domestic and foreign ships, with temporary permits not exceeding six months for the latter.

This regulation, the first of its kind, was issued by the then Minister of Foreign Affairs, Matías Romero. It stated that patents and permits enabled those obtaining them to set up temporary shelters on the coast to preserve fishery products and process them.

On July 3, 1883, the Ministry of Development sent a circular to all governors requesting reports on the various species of fish and crustaceans in their states. This was the second formal attempt to gather information on fishing as a national resource. The same had been attempted in 1854, but data was incomplete.

Baja California became famous for its pearls and whales; Campeche for its *cetacea*, such as dolphins and sharks; pigfish, lizard fish, *zaques*, sardines, *bulcay*, *pejepluma*, trout, pompano, snook, medregal, etc.; Guerrero for its ocean whitefish, *sigarrilla*, *chupa piedra*, trout, *charra*, and shrimp excelling in variety and size. Sinaloa is well known for its seafood, such as lobster, crab, oysters, crayfish, hawksbill and loggerhead turtles, shrimp and barnacles.

## Maritime law and resources

The age-old problem of the sea was aggravated in the 16th century by the emergence of nationalities and the determination of the rights of each nation. The principle of freedom of the seas was universally accepted only after bloody battles. The vital issue for coastal countries then emerged: how to determine a legal limit that would serve, at the same time, as protection against warlike incursions and as a source of sustenance for the people.

The limit of territorial waters has been debated for more than 400 years, with nations still unable to agree. At the time of Mexico's independence, Spanish law set Mexico a limit of 9 miles of territorial waters. With the Treaty of 1848, the U.S. recognized Mexico's right to 9 nautical miles. The recognition of fishing areas and the development of oceanographic studies at the beginning of the century, brought the issue once again into public debate, with the U.S. wanting to set a maximum limit of 3 nautical miles.

President Avila Camacho decreed that underwater land down to 200 meters was part of the nation's territory, thereby increasing Mexico's surface area by some 500,000 square kilometers. Mexico also claimed sovereignty over the waters adjacent to its continental shelf.

With 11.5 million kilometers of coastline on four seas -the Pacific Ocean, the Gulf of California, the Gulf of Mexico and the Caribbean Sea- Mexico enjoys one of the longest coastlines in the world. It extends 6,608 kilometers on the Mexican Pacific, including Pacific and Gulf of California islands that have approximately 1,008 kilometers of shoreline themselves. It is 2,611 kilometers long on the Atlantic side, including islands in the Caribbean, with close to 106 kilometers of shoreline. Mexico's continental shelf down to 200 meters, represents 153,000 square kilometers on the Pacific coast and 235,000 kilometers on the Atlantic.

The two maritime areas of Mexico, the Atlantic and the Pacific, are both situated in the tropical zone of the world's waters. In spite of this, they present very different ecological characteristics. The Atlantic side, where depleted stock waters predominate, display low organic productivity compared to the Pacific. The latter has waters rising to the surface carrying nutrients which, in turn, are highly productive organically. Therefore, while the Atlantic side offers relatively low productivity, the Pacific side is one of the most productive areas in the world's oceans.

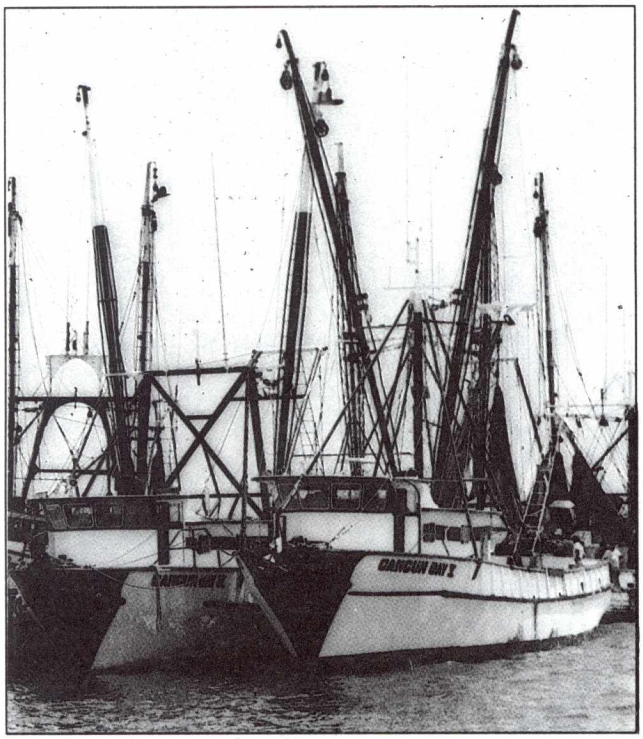
According to its oceanographic characteristics, Mexico's seas, generally speaking, consist of the following regions:

1. *Baja California-Pacific*: Located in the western part of the peninsula of the same name. It belongs to the southern portion of the California Current, carrying cold waters of low salinity southward.
2. *Gulf of California*: A prolongation northward of the Panamic region, though its mouth receives waters brought by the California Current. Considered an immense natural laboratory, it has caught the attention of scientists from all over the world. Some oceanographers consider it part of the Panamic region.
3. *Pacific Ocean Panamic Region*: The Mexican portion of the eastern Pacific tropical region, extending from close to Ecuador to the Gulf of California, also called the Panamic Region. Generally speaking, it has temperate waters, with marked seasonal and annual fluctuations.
4. *Southwestern Gulf of Mexico*: Includes the region between the Rio Grande and the San Pedro River and is characterized by the influence of the rivers flowing into its waters. Its bottom is made up mainly of waterborn earth sediments.
5. *Bank of Campeche*: Extends from the eastern part of the Laguna de Términos to Isla Mujeres, with a wide continental shelf and a bottom composed of calcareous sediments.
6. *Mexican Caribbean*: Extends from Isla Mujeres to the Belize border. It includes great expanses of coral reefs and highly saline ocean waters.

The significance of the sea was radically transformed for Mexico with the establishment of a 200-mile exclusive economic zone in 1976: 2,892,000 square kilometers, that is, more than 100% the country's total land surface (1,969,269 square kilometers).

Two main types of water are distinguishable off the Mexican coast, known for their generous abundance of species,

1. *Temperate waters*: Located in the northwest, the western coast of Baja California, and the Sea of Cortés or Gulf of California. They contain massive resources such as sardines, anchovies, squid and red pelagic crab.



*Tuna boats.*

2. *Tropical waters:* Located off the Pacific coast, from Mazatlán, Sinaloa, to Puerto Madero, Chiapas and the coasts of the Gulf of Mexico and the Caribbean. They shelter a variety of resources such as shrimp, lobster, clams, octopus, shark and most of the species known in Mexico as scale fish: grey snapper, rock bass and red grouper; pompanos, white sea bass, sole, croakers and kingfish.

Fisheries are so diverse in Mexico, as to make it difficult to adopt a single criterion to group them. Not only are methods and types different, but catches and processing also differ. However, there are two fundamental factors that determine the characteristics of all fisheries. They are the distance to the fishing grounds and the degree to which the catch is processed. The principal fisheries may be classified in the following three groups:

1. Traditional export fisheries: shrimp, lobster, abalone, some marine algae and giant kelp.
2. Mass high-sea fisheries: Tuna, sardine, anchovy, squid, sea crustacea and hake.
3. Regionally important species: Red snapper, shark, clam, octopus and oyster.

Mexico is among the world's top 20 fishing nations, its catches averaging 1.5 million tons annually. In 1990, the production of fish and other seafood in Mexico was 1,580,898 tons, of which 161,059 were exported, generating 475,244,000 dollars in revenue.

During the first three months of 1991, the balance of trade in fisheries products was favorable to Mexico in the amount of 104,300,000 dollars. During this period, 35,720 tons were sold in foreign markets, an improvement over the 32,255 tons exported during the same period of 1990, for a total of 95,286,000 dollars. This figure is lower than the total of 116,080,000 dollars earned from January-March 1991.

Mexico's most lucrative sea food product on the world's markets is shrimp. The processed catch rose from 4,361 to 5,767 tons during the aforementioned period. It earned a total of 54,568,000 dollars for the first three months of 1990 and climbed to 74,971,000 dollars in the same period of 1991. Other products exported were abalone, tuna, algae and giant kelp, skins, fish oil and fishmeal, as well as lobster and diverse thin-scaled species.

Catches of shrimp, abalone and lobster are exported mainly to the U.S., while tuna, skins and oils, fishmeal and scale species are also sold in Europe and Asia, mainly in Spain, Italy, England, Japan and Canada.

The diversification of markets, especially canned tuna and sardines, and fresh/frozen tuna in European and Asian countries during 1991, allowed Mexico's fisheries to place 175,565 tons abroad, for a total income of 493,455,000 dollars. This produced a favorable balance in the fishery trade of 439,499,000 dollars, Mexico having imported 54,886 tons of foreign seafood, at a cost of 53,956,000 dollars.

## Modernizing fisheries law

More than 300 agreements have been signed to date to permit the association of private investors with fisheries cooperatives, in the interest of coordinating the efforts of private capital with those of the government. Domestic and foreign investors may thus freely fish for reserved species provided they are associated with fishing cooperatives as stipulated by the law.

The legal criterion, and basically what the Federal Fisheries Law sets forth with respect to private-sector and foreign investment in association with fishing cooperatives, is that the control and integration of diverse legal arrangements should, in principle, be under Mexican law. Priority is given to Mexican investors and the maximum capital share for private investors may not exceed 49%.

The capture of species reserved strictly for fishing cooperatives, including *ejido* and communal associations, are abalone, mussels, clams, sand bass, shrimp, lobster, oysters, marine turtles and totoava. Should a foreign investor wish to fish for these species, he must become an associate of a domestic cooperative.

Foreign and domestic investment in the industrialization and export of marine products, is allowed great latitude, provided it conforms to Mexican law.

Insofar as aquaculture is concerned, Mexican and foreign investors must also adhere to the laws of Mexico. Under this heading, there is greater freedom for investing in the process as a whole, with the exception of those wishing to channel their capital into reproduction. This must be done through cooperatives, since collecting larvae and post-larvae is considered catching fish.

A special information booth has been set up at the Department of Fisheries to provide information on requirements, paperwork and orientation for parties interested in investment options for the sector. If prototype agreements had not been worked out, private and foreign investors would not have any access to reserved species. There are presently no plans to eliminate reserving such species to cooperatives just because the area is becoming accessible to the private sector. However, the law is under study and will be changed as the need arises, with an eye to the public interest and fishery productivity.

### Mexico: ecologically responsible

Species that were historically the object of major fishing, or that were potentially so, to the degree that they are now endangered species or on the verge of extinction, include crocodiles, aquatic mammals and some turtles, the totoava and pearl oyster, among others. Therefore, since the middle of the last century, Mexico has pursued a marked policy of conservation, particularly for animal species in danger of extinction. Among the actions and measures the federal government has taken so far are the protection of turtles, dolphins and marine mammals in general.

*Marine turtles:* Of the 12 species existing in the world, nine reproduce on Mexican beaches. The National Institute of Fisheries has been carrying out studies and research on marine turtles for more than 27 years. Directives for their protection and preservation have been issued based on the results of these studies since 1927. Testimony to this is the permanent prohibition of exploiting their eggs and destroying their nests, as stipulated in Article 50 of the Fishing Regulations issued February 17, 1927.

Given the destruction of this resource by man in the 60's, 70's and part of the 80's, on May 28, 1990, the total and permanent prohibition of capturing any and all species and subspecies of marine turtles was decreed for waters under federal jurisdiction in the Pacific Ocean, Gulf of Mexico and Caribbean Sea. Similarly, any animals caught accidentally must be returned to the sea immediately.

During the arrival of turtles on Mexican beaches in 1990-91, these provisions protected some 504,516 nests, 25,479,500 eggs were collected for artificial incubation, and 8,279,400 young released.

*Grey whale and marine mammals:* Measures applied by the Mexican government on the northwest coast of the

*Tuna coming aboard.*

Peninsula of Baja California have been determining factors in preserving the grey whale, one species threatened by extinction that has managed to recover. As part of these steps, the San Ignacio and Ojo de Liebre lagoons in the state of Baja California Sur are, by decree, natural refuges for the protection and reproduction of whales and baby whales.

Protectionist measures carried out through the National Program of Research and Conservation of Marine Mammals resulted in approximately 1,500 individual whales being identified in Mexican waters during the 1990-91 season, a number kept stable over the last 10 years. The grey whale population worldwide varies between 17,000 and 25,000 individuals, having previously dropped to about 3,000.

Policies protecting species have, as a result, also led to the recovery of other species, such as the sea lion population in the northern Pacific region and the Gulf of California. There has been a 7% increase in their number in the last 10 years, practically eliminating the risk of extinction. Currently, approximately 17,000 are estimated.

*Dolphins:* An important aspect in protecting marine species is the relationship between dolphins and tuna fishing. The Mexican government issued a priority decree on May 20, 1991, to cut the average rate of incidental death by 80% during operations of the Mexican fishing fleet.

The earliest Mexican regulations protecting dolphins during tuna fishing with purse-seines have been in effect since September 1977. They specify that the Mexican tuna fleet's purse-seines must be equipped with a dolphin safety panel to prevent dolphin deaths; "full astern" or "reverse gear" maneuvers must be executed immediately to facilitate the dolphins' escape; the obligatory rescue of dolphins by the use of skiffs; and the freeing of dolphins trapped in the nets, are among other obligatory measures.

Regulations issued by Mexico in 1977 were on a par with the norms of other nations, even those adopted by the U.S., under the 1972 act protecting marine mammals. Mexico reformed regulations on tuna fishing and protecting marine mammals in June 1987. The agreement requires tuna permit holders to take part in the Program for Protecting Marine Mammals, and aid observers and scientists in carrying out their activities on board tuna boats.

The May 20, 1991 agreement sets up a Committee of Experts from the Department of Fisheries (Sepesca), with the participation of representatives from the government and private sectors involved in tuna fishing, as well as highly qualified technicians from the tuna fleet and scientists specializing in the field. The committee is charged with doing follow-up studies on the incidental death of marine mammals, as well as evaluating how well the fleet does during its fishing trips.

Mexico hopes, by these measures, to meet its goal of cutting the rate of incidental death by 80% during the period 1989-1995. Present plans call for meeting half the goal set for the period in the first three years.

Moreover, by means of a June 13, 1990 agreement, Sepesca set a series of norms specifying both fishing equipment as well as maneuvers, installations and complementary elements for the Mexican tuna fleet, further assuring that marine mammals trapped incidentally will be freed. This same agreement prohibits night fishing and the use of explosives during any phase of purse-seine fishing for tuna that might be associated with dolphins.

In addition, permit holders must present annual plans for reducing observed levels of marine-mammal mortality to Sepesca. They must include an evaluation of how efficient their captains and fishing techniques are in helping to bring down recorded mortality rates.

As a result of the regulations in force since 1977 on purse-seine and fishing maneuvers for rescuing and freeing dolphins, incidental deaths of these mammals have been significantly reduced. A move of considerable impact on the reduction of incidental deaths was a program implemented in 1985: observers were placed aboard fishing vessels operating within Mexico's exclusive economic zone. This resulted in a better understanding of the interaction between tuna and dolphin, permitting us to expand our knowledge of the subject.

From the viewpoint that economic recovery is not at odds with protecting the environment, on September 27, 1991, the federal government issued a regulatory agreement setting forth the criteria to be followed by captains, fisheries technicians, crews and owners of domestic fishing vessels, as well as appropriate measures in case of nonfulfillment. It even provides for stronger recourse, permitting sanctions and even jail for violating laws concerning marine ecology and the protection of the species. In particular, it stipulates jail sentences for those violating restrictions on dolphins.

Similarly, and within the framework of the Program for Protecting Dolphins, approximately 3 billion pesos in funding are foreseen for studies on equipment and techniques to reduce incidental dolphin capture. At the same time, the federal government has pumped some 700 million pesos into the Project for a Natural Sanctuary for the Preservation of Dolphins at Punta Mita, Nayarit, turning it into an ecological reserve for dolphin preservation, increasing their breeding and encouraging them to develop under the best possible conditions.

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