

MONITORING AND SURVEILLANCE OF COASTAL ZONES

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INTRODUCTION

It is essential to verify the positive fulfillment of legal resolutions in the Mexican Law, regardless of the subject it is being applied to. This is done through acts of surveillance, inspection, investigation and supervision, which induce and promote the effective observance of rules and regulations, and of the plans laid by legislators and competent authorities. In terms of the Mexican federal environment this is the role of the Procuraduría Federal de Protección al Ambiente (PROFEPA; Federal Ministry for Environmental Protection).

The broader objective of PROFEPA is the protection of the environment and natural resources. Its specific objective is to supervise the observance of the environmental legislation and regulations.

The legal framework within which PROFEPA'S inspections are carried out obviously derives from the Constitución Política de los Estados Unidos Mexicanos (Political Constitution of the United Mexican States). Its general terms appear in the Ley Orgánica de la Administración Pública Federal (Organic Law of the Federal Public Administration) and the Ley Federal de Procedimiento Administrativo (Federal Law for Administrative Procedures). The specific assignments of PROFEPA and its administrative units are defined in the internal regulations of the Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT; Secretariat of Environment and Natural Resources) sectorial headquarters.

On a thematic level, the fundamental laws for PROFEPA are the Ley General del Equilibrio Ecológico y la Protección al Ambiente (LGEEPA; The General Law of Ecological Equilibrium and the Protection of the Environment) and its various regulations, the Ley General de Vida Silvestre (General Wildlife Law), the Ley General de Desarrollo Forestal Sustentable (General Law of Sustainable Forest Development) and the Ley de Pesca (Fisheries Law). For coastal environments and, specifically, beaches and shores, the basis is the Ley General de Bienes Nacionales (General Law of National Property) and its Reglamento para Uso y Aprovechamiento del Mar Territorial, Vías Navegables, Playas, Zona Federal Marítimo Terrestre y Terrenos Ganados al Mar (Regulation for the Use and Exploitation of the Territorial Sea, Navigable Waters, Beaches, Federal Maritime Zones and Lands Gained from the Sea). In questions of economic income, the legal basis is the Ley Federal de Derechos (Federal Law of Rights).

The urgent need for reform of the LGEEPA and the Ley General de Bienes Nacionales has to be emphasized. The latter has an ownership focus, rather than environmental, for beaches, reefs, keys and the Zona Federal Marítimo Terrestre (ZOFEMAT; Federal Maritime Terrestrial Zone). The LGEEPA, on the other hand, totally ignores ZOFEMAT and the other concepts mentioned above. The environmental law should incorporate all of them, as well as specify which refer to visual pollution and right of passage. The latter is barely mentioned and scenic aspects are not even mentioned.

The Ley General de Bienes Nacionales should lend an environmental dimension to ZOFEMAT, in addition to its intrinsic ownership character. The provision which establishes a 20 meter wide area for ZOFEMAT along the whole country's coast was established several centuries ago. It was based on the area required to maneuver a canon. The concept of ZOFEMAT has a couple of thousand years old origin, based on military and defense issues coming from

Roman law. The law we are dealing with is a little over a century old and has had numerous modifications. It would benefit from a thorough review.

Furthermore, the Ley General de Bienes Nacionales is confusing and contains gaps regarding the right of access to beaches by Mexicans. The maximum fine it establishes, on the other hand, is equivalent to a 500 days salary, which is clearly insufficient, contrasting with the LGEEPA's maximum fine of a 50,000 days salary.

MATTERS UNDER PROFEPA'S JURISDICTION

The six matters under PROFEPA's jurisdiction are or can be of concern to coastal zones: ZOFEMAT, environmental impact, marine resources, wildlife, forest resources and industrial inspection.

The regulatory aspects of these six issues are defined by SEMARNAT. PROFEPA is responsible for supervising and inspecting the observance of the regulations and its positive expressions: authorization, concessions, permits, licenses etc. Furthermore, PROFEPA has the role of delving on the origin of such authorizations, if required to.

PROFEPA has federal delegations in the 17 coastal states (in fact, in all entities in the country) for monitoring and surveillance of the shorelines. The central headquarters can also directly intervene and even take the lead on procedures initiated by the delegations.

The main aspects inspected by PROFEPA in coastal zones are: that the occupants of those areas have been granted the use of the site; that the use of the site is consistent with the corresponding authorizations; the type of work or activities carried out and their impact. Furthermore, changes in land use are reviewed to make sure they are duly authorized (above all in forest areas) and that the environment and natural resources are not affected illegally by industry or for any other reasons, and that there is no illegal trafficking of species. PROFEPA pays special attention to terrestrial and marine Protected Natural Areas.

MAIN EFFECTS ON THE COSTAL ENVIRONMENT

The following are some of the main environmental effects to coastal environments detected by PROFEPA:

Modification and Destruction of Habitats, Primarily by Large Tourist Developments, Including Hotels, Condominiums, Urbanization and Golf Courses, and by Industry

The most frequent cases are deforestation of species protected by Norma Oficial Mexicana-SEMARNAT-059-2001 (NOM - Official Mexican Standard-SEMARNAT-059-2001), in its different categories; this is the case of different species of mangrove tree, some palm trees and several cactacea. Similarly, damage derived from the acquisition of additional land by reclamation of coastal lagoons or marshes is relevant (It is already known that coastal environments in general tend to be more fragile than others, particularly estuaries. These are of enormous ecological importance due to the interaction and, ultimately, interdependence of many flora and fauna species which constitute its rich biodiversity, above all in tropical zones).

Furthermore, tourist mega-developments frequently affect coastal dunes for the sake of their "landscaping architecture", hotel and other construction projects. However, this trend is starting to revert because hurricanes have taught a painful lesson by affecting this real estate, so

that the natural protection provided by dunes is currently being revalued. A case that stands out is that of Quintana Roo, where the explosive growth of tourist activity along the Cancun-Tulum corridor has sometimes caused irreparable damage to the environment, such as the urbanization of Tankah, which reclaimed marshes and mangroves.

Destruction of the Coastline, Dunes and Adjacent Ecosystems (by Marinas, Docks, Jetties, Water Sports, All Terrain Vehicles, etc.)

Of course the coastline does not vary only because of anthropogenic factors, but most often as a result of natural phenomena. Man tries to reverse the consequences of meteorological phenomena through constructions that, in general, produce the results desired by the builders but have a negative effect on costal neighbors. That is the case of jetties which cause widening of the beach on the side of the predominant marine current, but on the other hand lead to reduction of the beach on the other side of the jetty, where the natural damage adds to the harm caused by human constructions.

The coasts of Yucatán and Quintana Roo stand out as examples of this, where frequent cyclones promoted the proliferation of beach recuperation projects. Pilot projects have been launched in Cancun using different technology for beach recuperation, such as the placing of large sacks filled with a cement-like material or wedge-shaped structures on the sea floor.

One of the most obvious ways of beach recovery is by refilling with sand brought from other areas on trucks and/or barges; this procedure is extremely laborious and, furthermore, to be effective it requires large volumes of sand which, in turn, affects the area from which the sand is extracted.

Ciudad del Carmen in Campeche is a particular case: Since the size of the town is limited by its island's borders, land has been reclaimed on the lagoon side to accommodate urban growth. In addition to the impact that this new, often illegally reclaimed areas have on the local environment, the impact on the places from which the material used for reclamation is taken is also important (except when salty sand is taken from dredged material from the shoals at the mouth of the lagoon in front of the city).

Deforestation and Illegal Wood Traffic in Costal Environments

In addition to the irregularities occurring in the mangroves of Quintana Roo and other states, it is important to highlight the illegal tree felling and wood trade in the protected natural area of Los Tuxtlas, Veracruz, and in different parts of the Yucatán Peninsula more or less close to the coast.

It is interesting to point out that the delicate and even dangerous tasks of inspection and surveillance carried out by PROFEPA are usually related to this subject, since there is usually a connection between these tree fellers, who are organized criminals, and narcotraffic. The operatives organized for these tasks are supported with public strength.

Illegal Capture and Traffic of Protected Marine Species (Mammals, Turtles, etc.)

The voluntary and involuntary capture of turtles takes place almost all the whole coast, and their consumption is basically local, although sometimes traffic is detected, especially of

turtle eggs. The basic material of traditional handicrafts of Campeche, originally from hawksbill turtles, has been replaced by bone and is no longer in great demand as it was decades ago.

In order to increase social participation in inspection and surveillance tasks, PROFEPA encourages the integration of participative community committees. Committees for the protection of turtle species have already been installed at five turtle nesting beaches in Campeche and Quintana Roo.

During the first semester of 2003 PROFEPA collected and sowed 729 thousand eggs in turtle camps of Tamaulipas and 90 thousand in Campeche.

It is important to also mention the case of the port of Veracruz, where the use of different types of shells and corals for crafting souvenirs has been a custom for several decades, and its eradication has not yet been successful.

Illegal Traffic of Protected Land Flora and Fauna Species

La Huasteca, Los Tuxtlas and the Yucatán Peninsula stand out for the illegal traffic of animal species protected by NOM-SEMARNAT-059-2001, above all birds (including parrots and related species), even in protected natural areas such as Sian Ka'an.

Introduction of Non-Native Flora and Fauna

The use of exotic species is widespread in landscaping of hotels, private houses and, sometimes, even parks and public gardens.

Collisions of Boats or Anchors with Coral Reefs

The incidence of this type of accident can be appreciated from the following data: between 1997 and 2003 there were 17 boat accidents, ten of them between Cancun and Cozumel and four near the port of Veracruz. In total they affected 11,600m² of coral reef. Despite the number of boats per region, in Veracruz 6,564 m² of coral were affected, whilst in northern Quintana Roo the reef area affected was 4,087m².

Discharge of Contaminants into the Sea and Subsoil

Practically all the important coastal populations along both Mexican coastlines (Gulf of Mexico and Caribbean, and Pacific) generate marine contamination through untreated or improperly treated wastewater, with the exception of Cancún, Ixtapa, and the bays of Huatulco (this is no coincidence, since all three are examples of contemporary tourist developments, which pay careful attention to this public service). The case of sewage from human detritus is the most widespread, although problems with industrial effluents also occur. The problem of sewage derives from inefficient treatment plants (due to technical reasons or to corruption, with embezzlement of funds assigned for the purchase of chemical products) and from direct discharge into the sea through canals, streams and, sometimes, even the drainage system itself.

There are cases, such as those of Tampico and Ciudad Madero, in which in addition to their own problems, they have to take on those generated in other areas. We are referring to the case of the drainage from Mexico City (actually the whole valley that harbors it), which flows towards Tula, where part of that water is used for agricultural irrigation of that region of the state of Hidalgo. It continues along the Río Tula, then the Río Moctezuma until it reaches the Río Panuco and finally empties into the Gulf of Mexico. This is a dramatic example of an anthropogenic phenomenon, since the Valley of Mexico was a closed hydrological basin until the 17th century when the German engineer, Heinrich Martin (Enrico Martínez) built the Huehuetoca or Tajo de Nochistongo canal, to avoid periodic flooding in the capital of Nueva España.

The problem of tourist beaches with polluted sea water, which, therefore, is not recommended for recreational use, impelled the creation of the Sistema de Información sobre Calidad del Agua en los Principales Destinos de Playa (Information System on Water Quality in

the Main Beach Destinations), implemented by SEMARNAT, Secretaría de Salud (SSA; Secretariat of Health), Secretaría de Marina (SEMAR; Secretariat of the Navy) and Secretaría de Turismo (SECTUR; Secretariat of Tourism). However, after three reports issued in first semester of 2003, the system was suspended.

THE CONCEPT OF ZONA FEDERAL MARÍTIMO TERRESTRE (ZOFEMAT: FEDERAL MARITIME TERRESTRIAL ZONE)

According to Article 49 of the Ley General de Bienes Nacionales, and other judicial laws and regulations relating to this subject, a beach is the strip of land that is covered and exposed by the sea from the maximum level of high tide to the minimum low tide within a year. To ZOFEMAT, on the other hand, it is the 20-meter wide strip immediately next to the beach, i.e., those 20 meters start from the point reached by the highest tide during one year. ZOFEMAT exists along the whole of the Mexican coast, including coastlines where there are rocks or even cliffs instead of beaches.

Furthermore, there is also the ZOFEMAT strip with the same dimensions around saltmarshes, coastal lagoons and any water body of marine origin. In addition, the ZOFEMAT is also present along both sides of the last 100 meters of rivers before they empty into the sea.

It is important to stress that the ZOFEMAT is legally inalienable and, therefore, always keeps its condition of “an asset of public domain and for common use” (it can also not be impounded or acquired by squatting). On the other hand, land reclaimed from the sea or other water bodies of marine origin can be removed from the federal patrimony, i.e., it can be sold. This difference is important because one of the main manners of affecting coastal environments is by land reclamation. Occasionally this occurs due to the disposal of solid waste or rubble, but generally these reclamations are purposely carried out to increase economically useable land.

It is interesting to note the example of numerous presidential resolutions regarding the distribution of agricultural land that establishes illegal boundaries for communal lands. It is not unusual for the Gulf of Mexico or Caribbean Sea to be identified as the boundaries of communal lands, ignoring the existence of the ZOFEMAT, and thus leaving the communal land owners with the false impression that they also own the beach.

One of the problems which cause the greatest confusion and discontent with regard to the ZOFEMAT is its mobility in terms of loss or recuperation of beaches, generally due to natural phenomena. When a hurricane reduces or even eliminates an original beach, the ZOFEMAT automatically recedes because it continues to be measured from the point of the highest tide during the year. For example, a person buys a plot of land adjacent to the ZOFEMAT and builds a house on it, but after an adverse meteorological phenomenon that reduces the size of the beach the ZOFEMAT area can include half the person’s living room and, with another hurricane, it can even reach the kitchen. Since the use of the ZOFEMAT forces the occupants to pay federal rights, and any building on the ZOFEMAT also becomes federal property, it results that the owners will have to pay this kind of rental for a plot and a building which were originally theirs, but do not belong to them anymore.

The opposite case is not equitable. If the sea moves away because the beach widens as a result of a violent storm (which also happens, although most often it is the other way around), the ZOFEMAT also moves away from the house and what remains between the two are areas of land gained from the sea (this concept applies to land gained either naturally or artificially). The use

of such plots also requires the payment of rights; the difference is that private owners can request disincorporation in their favor, i.e., purchase the land.

In face of this injustice or inequality (from a common sense approach), at the other extreme appears the opinion, equally well founded, that those who build next to the sea (or next to the ZOFEMAT) do so at their own risk.

Moreover, the concept of free access to beaches provided by the Ley General de Bienes Nacionales (in Mexico all beaches are public) is difficult to apply. In principle, this legal provision means that all land adjacent to the ZOFEMAT as well as this federal zone, should be open to the public. In practice, sometimes corridors are left between plots of land to allow the access prescribed by law, but often this is not the case. One example is the Cancun to Tulum tourism corridor, where the beach is inaccessible for many kilometers, and in fact becomes private. As the aforementioned law does not specify the acceptable distance between accesses, their juridical condition, who is responsible for their maintenance, how wide they should be and other such details, irregular situations result, like on the so called Mayan Riviera. The private security of hotels, condominiums and urban developments prevents access for those who are not housed there, because it has not been taken into account when each project was designed.

Throughout the world and in Mexico there are two types of coastal avenues, particularly in tourist centers: Those that have no constructions on the beach side of the roads (like in Rio de Janeiro, in Progreso, Yucatán, in Campeche and in the old part of the port of Veracruz); and those which have constructions on both sides of the coastal road (like in Miami and other areas of the United States, and in Cancún). The latter is somewhat antisocial and, above all, unpopular and goes against environmental considerations in terms of visual pollution and violation of scenic rights (which, in Mexico, is not taken into account, although in many other countries, especially in Europe, it is taken into account and even regulated).

SANCTIONS FOR ENVIRONMENTAL IMPACT AND ZOFEMAT VIOLATIONS

Official sanctions for environmental damage are provided by the LGEEPA, whilst those relating to ZOFEMAT are outlined in the Ley General de Bienes Nacionales. The striking difference between the maximum fine of 50,000 days minimum wage required by the first and the 500 days provided by the latter has already been mentioned.

There is also a contrast between the LGEEPA, which allows closure (temporary or definitive, total or partial), and the Ley General de Bienes Nacionales, which does not provide for the application of such preventive or urgent measures.

Paradoxically, just as the Ley General de Bienes Nacionales is less than vigorous in regard to the aforementioned issues, in other cases it allows for imprisonment; in fact, it stipulates from 2 to 12 years imprisonment for:

- a) Using the ZOFEMAT without prior concession, permit or authorization; or
- b) Not returning the ZOFEMAT to the authorities within 30 days of it being solicited.

In Mexico there are an estimated 120,000 people occupying the ZOFEMAT, only 10% of whom carry a valid permit; of course, this minority includes the main and largest occupants, whilst the other 90% of irregular occupants consists mainly of countrymen, fishermen, thatchers, etc. Evidently, it would be almost impossible to enforce the most rigorous side of the Ley General de Bienes Nacionales.

ACTIONS: PROFEPA INSPECTIONS IN THE ZOFEMAT

In 2002 and the first semester of 2003 PROFEPA made 958 inspection visits to the ZOFEMAT on the shore of the Gulf of Mexico and the Caribbean. The state of Veracruz contains 31% of the occupied ZOFEMAT areas, followed by 26% in Quintana Roo, 23% in Campeche and 12% in Yucatán. The high percentage in Veracruz is due to the numerous *palapas* (thatch-roofed buildings) used for food sales, abundant throughout the length of the state.