

## ***CEDO and Fisheries***

### ***A Historical Perspective***

by: Richard Cudney Bueno\*

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Throughout its 20 years CEDO has worked closely with many social groups in the communities of the upper Gulf of California and coastal Sonoran Desert. This 20 years of work at the community level implies 20 years of commitment to this bioregion and the people who use its natural resources. In particular, one labor that can not go unnoticed is this institution's efforts for conservation and sustainable use of fisheries resources.

As many know, the upper Gulf is one of the richest marine ecosystems in the world. Man, actually, has known how to use this productive sea for many years, overcoming the adverse conditions implied by living in a region that gets an average of only 4 inches of rain a year. To speak of the upper Gulf is basically to speak of fishing, because it is mainly fishing which has molded and given character to its communities and has put this region in the spotlight of national and international attention.

The history of the upper Gulf is a history of colonization by families of fishers, thanks to the enormous richness of the fisheries, a richness that has produced waves of abundance throughout the years. At one time the totoaba and shark reigned, later it was the shrimp, then came the chano, and today the gulf corvina, manta ray, crab and the mollusk diving fishery for black murex and "callo" or scallop. Each one of these fisheries brought new families and more boats to the region. These changing fisheries have been determined as much by the dynamics of the national and foreign markets as by complex ecological factors.

Today the region and its fisheries face new challenges as part of a Biosphere Reserve with a high and growing number of users, particularly in the small-scale or artisanal fishery (see *Cudney, R., 1997, CEDO News, Vol. 8 [1] pp. 1-9*). Fisheries in the upper Gulf are very different today than they were only 20 or 30 years ago. They have changed from being monospecific to being multi-specific, with a great variety of users taking many species of fish, mollusks, crustaceans and equinoderms, and using diverse equipment and fishing methods. In just 80 years of active fisheries, the upper Gulf has experienced at least three crises in its fisheries: the collapse of the totoaba fishery in the early 70s; the drastic decline in shrimp production in the late 80s and early 90s; and the virtual disappearance of the enormous schools of Pacific sharp nose shark at the close of the 80s. Nonetheless, this region continues to provide Mexico with a high level of production of seafood products. Today more than ever, it is imperative that we have a deeper understanding of the economic, political, cultural and ecological variables of the fisheries of the upper Gulf and that the fishing sector be involved in the search for management methods that can make the fisheries sustainable in the long-term. CEDO is responding to this need, working specifically with the small-scale fisheries. CEDO has a long history of involvement with various aspects of the fisheries of the upper Gulf: interviews with fishermen to begin assessing the incidental capture of the Gulf harbor porpoise or vaquita (see *Vaquita, p. 20*); work with the industrial shrimp fishery to establish more appropriate season closures and to support the establishment of the Biosphere Reserve; participation in the formation of the Upper Gulf Biosphere Reserve and more.

Although the region was designated a Biosphere Reserve in 1993, knowledge of the nature and dynamics of the small-scale fisheries was very limited at the time. For political and logistical reasons, the study of fisheries in the upper Gulf have traditionally been limited to the totoaba, shrimp and the incidental capture of the vaquita in gillnets. Likewise, efforts to involve the fishers in developing and implementing more sustainable management methods have focused on the industrial sector. This is not surprising, considering that historically all over the world there has been a lack of attention to what were traditionally small-scale fisheries. Only in recent years have governments and scientists noted the social, economic and ecological importance of these fisheries. An estimated 94% of all fishermen in the world are artisanal or small-scale fishermen and they provide approximately 45% of fisheries production worldwide. Artisanal fisheries are particularly important in developing countries, as they offer employment opportunities and are the main source of food for many communities. In Latin America alone, it is believed that about ten million people participate actively in fisheries, and of these about 90% are small-scale fishermen.

Considering the need for an up-to-date overview of the small-scale fisheries of the upper Gulf, as well as the need to promote the participation of the fishing sector in the management of its resources, in 1996 CEDO began its program "Participation of the Artisanal Fishermen of the upper Gulf of California", with funding from the David and Lucile Packard Foundation. This two-year project worked closely with the fishermen of Puerto Peñasco, El Golfo de Santa Clara and San Felipe, building confidence and respect, and linking CEDO to the small-scale fishery. This project used various ethnographic research methods, including participant observation and informal, semi-structured and structured interviews with individuals and focus groups. About 170 people, including fishermen, panga boat owners, fishing permit holders, leaders of cooperatives, personnel of the Biosphere Reserve and other government workers were interviewed.

During the first year, key fishermen and consultants were identified and a good reputation was built with the fishery sector. This process of relationship building involved participation in fishing trips for all the different fisheries. In this way information was collected about fishing arts and methods, species caught, seasons, zones and reproduction of the target species, the history of the development of each fishery, commercialization of species, and of prime importance, a range of fishers' opinions and proposals for management. This information was analyzed and organized to help identify "gaps" or areas that required further study or were of particular importance. Once the information was organized, we developed a second phase of field work consulting with fishermen and other key individuals in each community in their areas of expertise. Finally, we presented the preliminary results to focus groups of fishermen and further refined the information obtained. In the case of fishermen's proposals, very specific information was obtained ranging from ideas for improving the general administration of fisheries throughout Mexico to detailed proposals for their fishery.

The results of this extensive study were published in "*Pescando Entre Mareas del Alto Golfo de California: Una Guía Sobre La Pesca Artesanal, Su Gente y Sus Propuestas de Manejo*". This book, distributed to members of the fishing sector, academia, to non-governmental organizations and representatives of local, regional and national government, has fulfilled its purpose to serve as a guide to help define efforts and priorities for fishery management and define a common language and understanding about the artisanal fishery of the upper Gulf to these diverse sectors. Also, in an effort to facilitate communication within and beyond the Upper Gulf Biosphere

Reserve, we designed, produced and distributed some 25,000 copies of six editions of the newspaper "*Voces del Mar*" (Voices of the Sea). This newspaper included information about news relevant to the Reserve, interviews with older fishermen to relate and rescue histories of the fisheries of olden times, stories about the richness of current fisheries, and aspects of environmental education, in particular about the biology and ecology of certain species. Today, CEDO is continuing this publication, expanding it to cover stories and information from the Pinacate Reserve and renamed "*Voces del Mar y del Desierto*" (Voices of the Sea and the Desert).

Among all the results published in "*Pescando Entre Mareas del Alto Golfo*" the following are worthy of mentioning here. There are marked variations and distinctions in the use of fisheries resources by the artisanal sector within and among the communities of the region. Each community has its own seasons, zones and methods of fishing, synchronized to the patterns of nature as well as the dynamics of the economy. The huge tidal fluctuations of the area, migrations and spawning aggregations, and periodic algal blooms are some of the natural factors that can limit and determine fishing activities. Distance to the fishing zones, costs of equipment and gasoline, the market value and demand, the activity of trawlers, and territorial conflicts between and within each community are some of the nonnatural factors that determine what, how, where and when to fish. At least 70 species of fish, mollusks, crustaceans and echinoderms are regularly caught by the artisanal fleet. Approximately 40% of these species are destined for international markets, mainly California and the Asian markets in Korea, China and Japan. These numbers are particularly relevant considering that as recently as the 1970's the upper Gulf fishery concentrated almost exclusively on the catch of totoaba, shrimp, shark and corvinas.

Many of the target species use the upper Gulf to reproduce and to form breeding aggregations. It is precisely during this time that the catches are greatest as the cost of operations are reduced. Also, the reproductive season of many species coincides with Lent, a period of high demand for sea food in Mexico. This complicates the establishment of management plans.

We distinguished 15 general fishing zones, each with a multitude of specific fishing areas. Within these, we indicated the areas of overlap of "territories" used by different communities. The southern limit of fishing activities of the communities of the upper Gulf is Calamajué on the west coast of the Gulf (approximately 200 km from San Felipe) and Cabo Tepoca on the east coast (approximately 220 km south of Puerto Peñasco). To the north, fishing activities extend some 10 to 20 km into the delta of the Colorado River. One-day fishing trips often go out 60 or 70 km from port into the open sea, a distance sufficient to render inaccurate the name "coastal fishery" that is commonly given to small-scale fisheries.

Within and between communities informal agreements and rules have been established to limit free access to the fishing resources. One can observe fishing territories that attempt to control access by controlling the price of the product or by establishing that "foreigners" can only work with boats from the communities that have traditionally used these zones. Also, in some cases they practice rotation of fishing sites and selection of organisms caught (especially in the case of the diving and crab fisheries). These rules often collapse, however, under the influence of the demand for sea food and the pressures that buyers can bring to bear on the fishermen.

There is a wide range of specific proposals for management from the fishing sector, including: the establishment of fishing seasons, limiting the trawl fishery, increasing the flow of water from the Colorado River that reaches the upper Gulf (see *Turk Boyer, P., 1998, CEDO News, Vol. 8 [2] pp. 25-27*), the need to increase monitoring and enforcement efforts, and limiting the fishing effort. It is obvious that the fishing sector accepts the need for greater control of the fisheries of the region under various management schemes. In some cases, the fishing sector wishes to see greater control by the government, while others want the responsibility of defining and developing management plans to fall more at the community level. Above all, it is clear that whatever form management takes, it must reflect the ecological, political and cultural realities of the region. To date, many of the fisheries management actions applied to the upper Gulf are not appropriate to the region. The diversity of use by the communities of the upper Gulf and the particularities of the region should be recognized and incorporated into future management schemes.

Considering the complexities of fisheries in the upper Gulf, we suggest a good starting point for designing better management plans is to look at actual patterns of use of the different fishing zones and work with the identified sectors. Given that fishing zones usually persist as tangible management units over time, and that the fishers who actually use each zone can be identified it becomes possible to involve fishermen in the management process for specific zones. Also, working with specific types of users or sectors (for example, divers, gillnet fishers, crabbers) makes it possible to get more specific proposals for the fishery or fisheries they are involved with. Using the ecological knowledge of fishermen and stimulating a sense of pride in their fishing activities can help facilitate the management process. In addition, by actively involving a group of users in the establishment of management systems for their fisheries, and recognizing and fortifying the existing institutional arrangements for better management, the regulations will have greater credibility among the users and the incentives and willingness to respect them will be increased. This is of particular importance in a region like the upper Gulf, where the institutional capacity for enforcement is limited.

This study provided us with a general overview of the artisanal fisheries in the upper Gulf and has laid a foundation for focusing CEDO's participation in fisheries conservation efforts in the years to come. Having finished the study in 1998, CEDO is now in a position to refine specific aspects of the original study. Given the strategy of focusing management efforts on identifiable sectors, since 1999 CEDO has been working closely with the commercial divers of Puerto Peñasco, a sector that has taken the initiative to participate in management of the benthic resources which they harvest, primarily black murex, "callo" (rock scallops, pen shells), clams and octopus. Because of the extensive nature of this work, a summary of our progress is presented in a separate article in this issue (see *Co-Management of Diving Fisheries*, p. 12).

The road to sustainable fisheries management in the upper Gulf of California is a long one. We are just now beginning to understand the dynamics of the fishing industry and the ecology of the harvested resources. But CEDO has made an important and significant beginning in this process. We are encouraged by the sincere and active participation of fishermen, which is the key to success. ♦

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