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**The Role of a Non Governmental Organization (NGO)  
in an Emerging Co-management Regime:  
The Mexican Seri Indians' case study**

by

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## **ABSTRACT**

In Mexico, many of the coastal ecosystems that have traditionally been used by local communities for small-scale fishing activities are near or, overexploited. Some important causes are: 1) absence of clearly defined fishing property rights, 2) diversity within fishing communities, 3) failure by governmental agencies to effectively support local community development, 4) low effectiveness of fishing regulatory tools designed by the government, and 5) lack of reliable biological data of fishing resources to guide their management.

The Seri Indians, a seafaring tribe that has inhabited the central portion of the Gulf of California for thousands of years, offers a unique setting among Mexican small-scale fishing communities. After surviving several extermination wars by Spanish and Mexicans, the Mexican government granted them their own marine territory in 1975 to assure their survival and reduce potential conflicts with other Mexican communities. This territory includes a portion of coastal land, an island, and the coastal waters surrounding it. Only members of the Seri fishing cooperatives are authorized to extract marine resources from this area. According to Mexican laws, marine resources are the property of the nation and its management is a federal government's duty, thereby originating a *de facto* co-management regime between the tribe and fisheries' authorities. However, historic conflicts and lack of trust between both institutions often prevents an efficient collaboration towards better use of marine resources. In this action setting a new local Mexican NGO is successfully situating itself as an institution that can play a decisive role towards a better management and conservation of the tribe's marine natural resources. In this paper we analyze the key factors that positively contribute to the organization's role for a better co-management regime in Seri territory. We also discuss the possibility of replicating this model in different settings and the problems that may arise during implementation.

## **INTRODUCTION**

The story of the Seri Indians is a very peculiar case within the more than 70 native groups that exist in Mexico. They are one of the few native groups that has been granted legal ownership of a portion of their historic territory by the Mexican government. They are also one of the smallest ethnic groups in Mexico (INEGI 1991), though probably one of the richest in terms of the vast and varied natural resources they possess, since their territory includes a portion of coastal land, an island, and the coastal waters surrounding it (DOF, 11/02/1975). Only members of Seri fishing cooperatives are authorized to extract marine resources from this area (DOF, 11/02/1975). According to the Mexican Constitution (1917) and the Mexican Fishing Law (1992), marine resources are property of the nation and its management is the government's duty. This situation gave rise to an incipient but real co-management regime between fisheries' authorities and the tribe. However, inexperience, historic conflicts, and lack of trust and reciprocity often act as high transaction costs between the Seri, the Mexican government, and local fishermen, preventing collaboration towards a better use of the local marine resources. In this action setting, a new local Mexican non-governmental organization (NGO) is successfully situating itself as an institution that can potentially play a decisive role towards a better management and conservation of the tribe's natural resources.

We start this paper by presenting a brief and general background of the government's strategies for the development of small-scale fisheries in Mexico since 1970. This is useful for understanding the important role that national and international NGOs are starting to play in the development of alternative strategies for coastal management in small-scale fishing communities of Northwest Mexico. It will also help to better understand the context in which our case study is embedded, and which we describe by drawing back to the most relevant historic events of Seri culture from the eighteenth century to present that have profoundly shaped the state of their current common pool resources (CPR).

## **Brief Background on the Effects of Mexican Government Policies in the Development of Small-Scale Fisheries**

In Mexico, small-scale fishing communities have historically received very little attention and support from federal and state governments. Nevertheless, in the 1970s with the economic bonanza created by the accelerated oil production, the federal government devoted considerable resources to develop and thrust small-scale fishing infrastructure. Many wharfs, jetties, roads, and ice plants were built in coastal communities to provide fishermen with means to increase their productivity, create regional development, and a better quality of life (Lobato 1996). The government's efforts soon proved insufficient to change the existent fishing practices, underdevelopment and poverty conditions. Corruption, lack of interest or knowledge, and inefficient infrastructure design practices, help explain the existence of ice plants in places without easy access to potable water, location of wharfs in inappropriate sites, and cold plants that never started operating and were converted into private offices or storing rooms. The construction of infrastructure alone, proved to be unable to change the prevalent institutional structures necessary to generate better productive practices and local development (Putnam 1995).

Although the government's paternalistic approach to support the development of small-scale fisheries failed in many ways, most of the growth and development of small-scale fisheries along the coast of Mexico, was achieved under this policy. Moreover, the State's strategy included a more holistic view of what fisheries development meant, than the *neo-liberalism* policies imposed in the next decades (1980s -1990s) (Lobato 1996). Significant changes took place in the fishing industry in the years to follow in order to allow market forces to operate freely. Most of the state owned enterprises were privatized, investment from the public sector was drastically reduced, and the cooperative's legislation suffered structural modifications (Lobato 1996). The balance of the costs and benefits of the implementation of these *neo-liberalism* policies are still to be analyzed. However, some of the noticeable short-term effects are the emergence of a new empowered social class that is able to capture most of the benefits generated by this activity. Nowadays, there is evidence that more and more fishermen work for a

contractor who is the owner of the fishing gear, production means, and usually hold the fishing permits (H. Weaver personal communication<sup>1</sup>). The fishermen's role is changing to solely be the hand labor of the fishing activity, without much say or influence in the industry, or over the commons where they have fished and lived most of their lives. Under this scheme the gap between the poor and the rich is expected to increase. In contrast with the rapid growth of small-scale fisheries in the past decades, the government's information and understanding of this dynamic world is practically null<sup>2</sup> from the biologic, economic, and socio cultural points of view. Some of the alleged factors from the government's lack of interest or inability to study and therefore design adequate policies for this industry, are the diversity and isolation of coastal communities, the inability of fishermen to organize themselves, and the dominant conception of the low profitability and backwardness inherent to coastal communities (Lobato 1996).

Recently, governmental authorities introduced the idea of sustainable development to the exploitation of natural resources. This new national policy resulted from the flurry of global ecological awareness and action in the late 1980s, that led to the proliferation of international environmental agreements among nation-states (Peluso 1993).

These policies inherently promote values of equity, participation, democracy, mutual help, and well being. However, the idea of sustainable development is doomed to fail in coastal Mexico, if an effort to understand and address the prevalent situation in small-scale fishing communities is not done (Lobato 1996).

The promotion of these sustainable development policies benefited national and international conservation organizations and attracted their attention to regional ecological "hot spots". With the financial support from international donors, political backing from the state, and moral support from the scientific community, NGOs are starting to play an important role in managing natural resources (Sundberg 1998).

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<sup>1</sup>Weaver, A.H. Personal Communication. School of Marine Affairs, University of Washington. Seattle, WA.

<sup>2</sup>With the limited exceptions of the highly profitable abalone and lobster fisheries (Siri and Moctezuma 1989).

## **The Role of Non Governmental Institutions (NGOs) in Northwest Mexico**

In the last six years the emergence of international, national and local NGOs in Northwest Mexico has dramatically increased (Ordóñez et al. 1993, Kropp 1998, Anónimo 1999). In these years most of the initial conservation efforts have concentrated on collecting biologic baseline data, creating environmental awareness in the region, defining priority conservation areas, supporting the design of management plans, and building local decision making capacity.

Empirical evidence has shown that few conservation organizations have succeeded to situate themselves as effective promoters of conservation of natural resources, and once funding is exhausted support ends –often- in a dramatic way. Newly locally crafted institutions slowly dismantle and previous conditions are resumed (Western and Wright 1994). In some cases this situation has generated disbelief, resentment, and unwillingness to cooperate in future natural resources projects among members of fishing communities (H. Weaver personal communication, R. Cudney personal communication<sup>3</sup>, O. Hinojosa personal communication<sup>4</sup>).

The reasons for these observed behaviors are varied. Based on empirical and experiential data, we believe that in some cases organizations have underrated or have not been capable of incorporating local knowledge and participation into the conservation process. The efforts to understand the working structure of local institutions have been done in an unilateral way, failing to incorporate the above elements into the project's goals. Incongruously enough, the international conservationist rhetoric has long recognized the need to include local participation and knowledge in order to accomplish positive results (Peluso 1993). In this context we speculate that there is a serious incompatibility between the goals that these organizations have proposed, and their organizational, financial and technical structure and capabilities. Therefore, NGOs and funding organizations need to acknowledge that if integrated conservation and development is going to be achieved, it is necessary to

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create adequate organizational structures that are congruent with local institutional time frames, which are not measured in months or years but in decades (Putnam 1993). The inertia and reach that the conservation movement achieves in the future, will depend on the amount of public support and local involvement created around the conservation movement. Empirical evidence of resentment feelings and disbelief among some fishermen towards biological research for conservation purposes, should be considered to alert NGOs and resource managers about the risks and damage that the inappropriate design and execution of conservation projects could cause to local communities, biodiversity, and the conservation movement itself.

Some lessons of the initial conservation efforts in Northwest Mexico in coastal communities, show that to achieve effective and integral conservation of fishing resources, conservation strategies need to emerge from the understanding of the interrelation between biological, social, cultural and economic elements that compose each particular CPR setting in which the community is embedded. This strategy implies the use of a multidisciplinary approach to address conservation issues. Also implied is the necessity of investing a considerable amount of time in the community and the resource, to visualize and determine the feasibility of getting involved in the slow process of interweaving conservation values, and better productive practices in local existent institutions.

To illustrate the above argument, in the following sections we draw on the initial experiences, relevant factors, and methodologies that a NGO, named Comunidad y Biodiversidad [Community and Biodiversity (CoBi)], is applying to promote conservation and development in the CPR setting of the Seri Indians, in the context of a *de facto* co-management regime.

First we describe the setting in which the Seri CPR is embedded. We then briefly describe relevant events that lead to the creation of the organization, and to its first collaborative projects with the Seri tribe. Following this we analyze learned lessons, possibilities of replication, and the challenges and difficulties for the future before finishing with conclusions.

## **THE PHYSICAL SETTING**

For more than 2,000 years, the Midriff Island Region (MIR) of the Gulf of California has been home for the Seri Indians (Bowen 1976). The MIR is located in the central part of the Gulf of California (Fig. 1). It includes more than 39 islands and islets, and it is believed to be the most pristine low latitude island archipelago in the world (Bahre 1983). The low level of anthropological disturbance in this region reflects the prevalence of a harsh environment that has prevented the establishment of population centers in the area (Bahre 1983). The MIR and coastal land lack any value for local industrial activity (freshwater, minerals, or fertile land) (Bahre 1983). Only marine resources have attracted people in more recent times (Bourillón 1996, Bourillón and Basurto 1998). The whole region is extremely arid. The annual temperature pattern is one of high heat in the summer and cool winters. Highest diurnal temperatures occur during summer, when it's not unusual to raise above the 40°C. In the winter the influence of the predominant Northwestern winds can drive temperatures to the range of the 10°C (Hastings and Humphrey 1969).

The flora is typical of the Sonoran Desert, however, Felger and Moser (1985) classified the major biotic communities in the Seri region as: Marine vegetation (marine algae communities and seagrass meadows), littoral scrub (mangrove scrub and salt scrub), desert scrub (coast scrub, cactus scrub, mesquite scrub, creosotebush scrub, mixed desertscrub, riparian desertscrub) and thornscrub.

## **RELEVANT HISTORIC EVENTS IN SERI HISTORY**

The origin of the Comcáac, as the Seri call themselves, is not well understood yet. Some researchers believe that the Seri ancestors came to Sonora from Baja California by crossing the Gulf of California using reed boats (Bowen 1976). Seri oral traditions also link them with Baja California (Felger and Moser 1985). Others speculate that they could be related to Yuman groups from Northwestern Mexico and Southern United States such as the Cocopa, Diegueño, Havasupai, Kiliwa, Maricopa, Mojave, Paipai, Quechan (Yuma), Yavapai, and Walapai. These groups, along with the Seri, pertain to the Hokan language stock (Marlett 1981), however, Seri language is believed to be a

linguistic family of its own and the relation is still not very clear, if any, it could be extremely distant (Crawford 1976).

Spanish made the first written record of the Seri in the sixteenth century (Sheridan 1999). However, both groups remained without contact until the Seri started to steal small livestock owned by Spanish farmers that had settled along the boundaries of their territory (Spicer 1962, Sheridan 1999). Hostilities between both groups began, and would last almost three centuries. During the seventeenth and eighteenth century, Seri augmented their hunting and gathering subsistence by raiding Spanish settlements and missions (Spicer 1962, Bannon 1955). Felger and Moser (1985), state that only the Apache gave the Spaniards more trouble. By 1748, the Spanish launched an open extermination war against the tribe (Sheridan 1979). Although no decisive battles were fought, the Seri were being gradually defeated by Old World diseases and decades of unrelenting warfare. By the nineteenth century the remaining Seri population was mainly concentrated on their ancient desert camps (Felger and Moser 1985).

After the Mexican Independence War, Mexican settlers started establishing along the Seri territory. This time ranchers tried to hire Seri to work the land, and some successfully made friendship with Seri families. However, for most of them, food resources like cattle and horses had just become available again in their hunting grounds. Soon, war started again. Mexican troops diminished the Seri population and forced it to take refuge in Tiburon Island (Fig. 1) (Spicer 1962, Felger and Moser 1985). In the 1920s, Kino Bay, Sonora, was established as a Mexican fishing village (Flanagan and Hendrickson 1976). Seri started participating in small-scale commercial fishing activities. Isolation was not feasible any more, their population numbers were below 200 people (Felger and Moser 1985). U.S. citizens also adopted Kino Bay as a prime sport-fishing destination. Seri started having non-hostile encounters and interactions with U.S. tourists and field scientists. As part of the modernization and acculturation process, the Seri people started adopting modern European conveniences and customs (Bowen 1983). However, Spicer (1962:115) states that essentially their traditional life continued as it had for centuries:

*“During the 1930s nearly every Seri family acquired boats. Food, clothing, and tools available through the stores maintained by the Mexican fish traders began to be more and more widely used. Essentially Seri life changed little. The old form of brush shelter continued to be used and the traditional forms of social life and religion were maintained. Although Kino Bay became a much-frequented base for the whole group, families still spent periods on Tiburon Island and along the coast north and south of Kino Bay, roaming in the old nomadic way. Their new mobility by means of the plank boat gave them, in fact, a somewhat wider range than before.”*

In 1938, the Mexican government established a fish cooperative in El Desemboque; one of the Seri seasonal camps. This was the government’s first attempt to settle the Seri in a definite place without trying to relocate, exterminate, or turn them to activities foreign to their culture (i.e. farming) (Bowen 1983). A fishing processing plant and storing rooms were built. The main fishery was shark harvested mainly for its liver, from which several vitamins were extracted. By the 1940s artificial synthesis of vitamins was made possible and the Seri fishing cooperative collapsed. El Desemboque remained as a small village where Seri people permanently established. When the shark fishery collapsed the Seri resorted to commercial turtle hunting, especially the once common green sea turtle (*Chelonia mydas*) (Cliffon et al. 1995). Seri Indians had harvested sea turtles for subsistence purposes for thousands of years, but commercial hunting began modestly around the 1930s and escalated sharply after the 1940s. By the 1980s sea turtles were scarce in the entire Mexican Pacific coast and due to international pressure their fishing was nationally banned (Cliffon et al. 1995).

The banning of the sea turtle fishery brought serious repercussions to the community since sea turtles constituted one of the most important sources of protein in their diet. Historically sea turtles had an important role in the Seri society and the banning had important cultural repercussions as well (Cliffon et al. 1995). Today the main Seri fisheries are the blue swimming crab (*Callinectes bellicosus* and *C. arcuatus*) fishery, and the sea pen shell (*Pinna rugosa* and *Atrina tuberculosa*) fishery.

## THE FISHING CONCESSION

A major event in the history of the Seri people took place in 1975, when the Mexican government granted them their own territory as means to assure the tribe's cultural survival and reduce potential conflicts with other Mexican communities (DOF 11/2/1975). This territory includes a portion of coastal land, Tiburon Island (Fig. 1), and the coastal waters surrounding it. This important declaration of private property rights has shaped Seri modern historic events. It is a source of income, pride, and constant conflict in regards to marine resources.

While limits of the terrestrial boundaries of the territory are clear and widely accepted locally and at all governmental levels, the ones regarding the fishing concession are not. The marine boundaries to the fishing concession are vaguely defined and leave too much room for individual interpretation. The concession states that:

*“... only members of the Seri tribe and those of the Seri fishing cooperative are allowed to participate in fishing activities on coastal waters of the Gulf of California and the surrounding waters of Tiburon Island situated in the Sea of Cortez.”*

The consequences of the government's failure to properly match rules with the specific characteristics of the Seri common-pool resource (CPR), have triggered a series of conflicts and informal institutional arrangements between the Mestizo and Seri fishermen depending on the degree of exclusion that the Seri are able to achieve. Conflicts between both groups often arise, catalyzed by historic and cultural mistrust that permeates their day to day relations. The only marine portion where the Seri can entirely exclude other small-scale fishermen is the Infiernillo Channel, located between the East coast of Tiburon Island and the mainland (Fig. 1). Here, the Seri have devised a bundle of collective rules of access, which when fulfilled grant mestizo fishermen access to the Channel fishing grounds.

However, most of the other portions of Tiburon Island (specially in the South and West) are used by the mestizo fishermen (mainly from Kino Bay). Seri claim that the informal arrangement between them is: that in order for the mestizo fishermen to fish in those areas they need to pay the traditional government a “Seri fishing permit”. Mestizo fishermen rarely comply with this rule. Besides that, most of them disagree with the

fairness of this rule, the low enforcement capabilities of the Seri tribe serve as a strong incentive for the mestizo fishermen to ignore it and take their chances. When the Seri fishermen do encounter mestizo fishermen camping or fishing on nearby Tiburon Island, the conflicts or arrangements that emerge among them depend on specific circumstances of the encounter, individuals involved, and their bargaining abilities, among other factors. Usually, the devised arrangements range from payment of a monetary sum, confiscation of fish product, or simply the promise that a personal favor will be returned in the future. However, there is anecdotal information that few cases have involved violence. Most likely, the non Seri fishermen involved in those violent encounters were not from the area. The fact that Seri and local mestizo fishermen rarely engage in violent confrontations, reassures the importance of the existence of multiplex relations outside the fishing sphere in the crafting of institutional arrangements (Ostrom 1997).

For the Seri fishermen, the existence of these informal arrangements in the areas of Tiburon Island they cannot enforce, are the only way of capturing a fraction of the value of the fishing resources that otherwise would be totally lost.

As other case studies have shown (Jodha 1996), the existence of functional institutional arrangements for the exploitation of common pool resources do not guarantee their conservation and long term life of the economic activity. Uncertainty, the low level of enforcement capability by the Seri Indians and the mistrust with which they are regarded, act as a strong incentive for the Mexican fishermen to harvest as many resource units as they can while allowed in the area. Resource depletion can be expected in this scenario.

### **THE EXCLUSIVE FISHING ZONE (EFZ)**

Among their fishing concession, the only area of the Seri marine territory that acts as an exclusive fishing zone for the Seri Indians is the Infiernillo Channel (Fig. 1). Because of its physical characteristics, the access to the channel is easy to enforce and it is regarded by non Seri fishermen as the primary fishing ground for the Seri. The area is rich in commercial marine resources like mussels (*Modiolus capax*), snail (*Hexaples*

spp.), octopuses (*Octopus* spp.), pen shell (*Pinna rugosa* and *Atrina tuberculosa*), and crustaceans like the blue swimming crabs (*Callinectes bellicosus*, *C. arcuatus*) and shrimp (*Penneaus* spp.), several species of sharks and manta rays (mainly *Rizoprionodon longuro*, *Dasyatis brevis*, *Gymnura marmorata*, *Narcine entemedor*, *Rhinobatos productus*), and fish like mullet (*Mugil cephalus*, *M. curema*), sea bass (*Paralabrax maculatofasciatus*), trigger fish (*Balistes polylepis*).

The fact that the 1975 decree (DOF 11/2/1975), conferred exclusive fishing rights to the tribe over their marine territory, and that the Mexican law stipulates that the management of natural resources is the government's duty, originated a *de facto* co-management regime in the Infiernillo Channel between the Mexican fisheries' authorities and the Seri Traditional Government. Nevertheless, regional fisheries authorities and members of the Seri tribe do not easily recognize this shared responsibility, in part because the designation of the Seri territory was the result of a federal top-down process. Moreover, the Seri historical resentment and contempt for any kind of governmental representation, act as high transaction costs to prevent fisheries authorities from engaging in mutual cooperation to manage these resources. The result is that practically no collaboration (or conflicts) have emerged between fishery officials and the tribe, mostly because there is no contact between them. The few fishery biologists of the region are deployed to oversee more economically and thus politically more important industrial or small-scale fisheries like shrimp, sardine or shark. Until today there has been not enough political pressure that acts as an incentive to craft and facilitate a real co-management process.

The Seri on their part, believe that they are better off without government assistance. They are afraid that any kind of involvement of the fisheries authorities will result in the banning of marine species on which they fish, similar to what happened with the sea turtle fishery. Currently, many Seri are still upset over this prohibition, they link the ban with the research of a scientist that had previously worked with green turtles in the Infiernillo Channel.

In recent times, the Seri exclusive fishing zone has attracted researchers interested in learning and developing community based or co-management alternatives for the

management of the Seri marine resources. Many believe that with the appropriate support, the Seri CPR setting could turn into a successful co-management and conservation story.

## **THE BIRTH AND FIRST STEPS OF A COMMUNITY BASED NGO**

The creation of Community and Biodiversity (CoBi) in March of 1999, institutionalized the presence of a group of 5 Mexican marine resources researchers in the region, where they had accumulated experience from decades of work, and an extended web of communications with universities in Mexico and abroad, as well as with non-governmental Mexican and international organizations, and with local and regional governments.

The expertise of the group has been centered on: 1) conservation of endemic and endangered marine mammal species; 2) analysis of information about marine biodiversity in the Gulf of California; 3) publication of articles and books about the biological importance of the islands in the region and their threats; 4) the development of strategies for the local participation of coastal communities in conservation projects; and 5) integration of interdisciplinary work teams, as well as the mediation and negotiation to achieve common objectives of coastal management (Comunidad y Biodiversidad 1999).

As a Ph.D. student, the current Executive Director of CoBi started visiting the Seri community often in 1997. He was interested in looking at the efficiency of the Seri exclusive fishing zone (EFZ) in fisheries management for his dissertation research (Bourillón in prep.). In 1998, he and his family moved to the town of Kino Bay in order to start his fieldwork. Their local presence in the area and constant visits to the Seri village, slowly helped to build the necessary rapport, trust, and credibility among key members of the Seri tribe. This eased the entrance of another Ph.D. student to work in the Infiernillo Channel. His main interest was to look at the impacts of the swimming crab fishery on the marine biodiversity of the Seri EFZ (Torre in prep.). The search for financial support for the dissertation projects mentioned above, originated new projects

around the Seri EFZ (Bourillón and Torre 2000, Torre and Bourillón 2000), and the necessary momentum that helped to jumpstart the formation of the NGO later in 1999. The creation of CoBi reflected a largely perceived necessity by its members for the existence of a group that could promote local participation in the management of marine resources, and at the same time participate in the conservation goals and strategies that the government and the society have set as priorities, in order to achieve community development and biodiversity conservation.

The creation of CoBi coincided with important political structural changes within the Seri Traditional Government, favoring and magnifying CoBi's role and interaction with the community.

### **Recent Political Changes in The Seri Traditional Government**

It is believed that the clan was the basic unit of the Seri society, and no centralized leadership or structured tribal organization existed (Bahre 1980, Sheridan 1999). It is likely that the modern structure of the Seri government was formed in the early twentieth century. After the creation of the Seri fishing cooperative in the 1940s, and later the designation of territory in 1975, the Mexican government recognized three political and administrative positions in the Seri government: the traditional governor, the "*ejido*" commissary, and the fishing cooperative director.

The traditional governor is the highest representation of the Seri community on any internal or external issue concerning the Tribe. The regular term lasts 3 years without the possibility of a following term. Internally, an elderly council composed of three respected elders, acts as an advisory board to the governor on a variety of issues concerning the community.

In 1996 the elected governor resigned due to alleged corrupt practices, and in 1998 the acting Governor of the tribe called for elections. This election varied from all the previous ones in three important aspects. Candidates were organized in blocs, the vote was held in secret, and the women were allowed to vote for the first time. To the surprise of most of the Seri elderly, who had traditionally held the control of the tribe, the winning bloc was composed of young Seri, and the elected governor had less than thirty five years old and was one of the few young Seri that has pursued a college education.

The new Seri government showed the desire to lead the tribe in a more democratic fashion, and rely on a strong technical support for the management of their natural resources. This important change on the political structure of the tribe, created the adequate environment to formalize the collaboration with the Seri government. A formal cooperation agreement between CoBi and the Seri government was signed on July 30, 1999, to collaborate on marine resource conservation and management issues (Comunidad y Biodiversidad 1999). This agreement was used as an umbrella to get a more specific commitment from the Seri government and the Seri fishing cooperative to participate in the work that CoBi was already carrying out in the community.

### **Specific Actions of CoBi and Collaborative Projects**

CoBi's first two projects consisted in characterizing small-scale fisheries and marine environments of Seri fishing areas (Bourillón and Torre 2000), and the construction of a biological inventory of the Infiernillo Channel (Torre and Bourillón 2000). These projects constituted the first steps to gather the basic information necessary to establish a co-management program for the small-scale fisheries in the Infiernillo Channel (Comunidad y Biodiversidad 1999). The involvement of members of the community was an integral component in the design of these projects. By involving Seri fishermen in data collection and mapping of fishing areas, it was possible to assess the Seri collective knowledge regarding their marine environment and start building local capacity.

The information generated was presented to the Seri Community and fishing authorities and it is believed to create a common understanding between both parties on current conditions of the resource.

The trust and reciprocity between CoBi and the tribe's government, has generated spaces for CoBi to organize, facilitate and create arenas for the tribe's discussions on their natural resources knowledge and management. A valuable example was the workshop on swimming crab biology that CoBi created for 15 young Seri. This workshop was part of the "Para-Ecologist" training program organized by the Arizona-Sonora Desert Museum (ASDM), the Traditional Seri Government and CoBi. This program created the adequate arena for the Seri elderly to explain their traditional knowledge on

the swimming crab fishery to the young fishermen of the tribe. It was possible to obtain empirical knowledge of the taxonomy, life cycle, differential sex distribution, hibernation zones, use, and traditional value of the swimming crab for the tribe (Comunidad y Biodiversidad 2000).

Recently, CoBi initiated the first steps towards sustainable small-scale swimming crab (*Callinectes bellicosus*) fishery in the MIR, through a pilot case study in partnership with the Community Based Certification of Fisheries Program (CBCF) of the Endangered Seas Campaign of the World Wild Fund for Nature (WWF-US), Marine Stewardship Council (MSC), WWF-Mexico Gulf of California Program, and the David and Lucile Packard Foundation. The project is highly participatory in conception and nature of implementation. It involves strategic alliances between local fishing cooperatives and businesses, national and international academic institutions, indigenous, state, and federal governmental agencies, all under coordination and promotion by CoBi. To fulfill its goals, project activities involve research directed towards providing the biological and ecological elements needed for the assessment of the sustainability certification criteria used by the MSC. Research needed for the improvement of the fishing methods used to reduce their impacts on marine biodiversity, as well as a feasibility analysis about the development of a fund for the commercialization of sustainable fisheries products from this region. Furthermore, environmental education materials are being developed to stimulate community participation and to communicate the ecological importance of the marine and coastal environments, the natural history of the swimming crabs, the impact of its fishery in the marine environment, as well as the economic benefits of a certified sustainable fishery. The project also involves active participation and promotion of a recently formed state management committee of the crab fishery as a co-management arrangement to achieve a responsible fishery. (Comunidad y Biodiversidad 1999).

## **LEARNED LESSONS**

Members of CoBi invested a lot of time as observers of the existent local institutions of the Seri tribe before engaging in any research initiative. In this time, the main activities of the members of CoBi where devoted to visiting the community and participating in

fishing trips as a way to build interpersonal relations with members of the tribe. This enabled CoBi to start to understand the intricate and dynamic structure of the Seri CPR. Moreover, it granted them the possibility to apply this knowledge to projects design in the Infiernillo Channel.

Unlike other organizations and individuals in the past, CoBi was not perceived as a threat or invasion to the community when its members started conducting biodiversity studies in the Infiernillo Channel. This was in part due to the network of mutual trust and reciprocity that CoBi had developed, but also, because CoBi focused its research towards activities that didn't constitute a source of political and economic conflict among tribe members. This allowed CoBi to construct a good working relationship with the Seri Government and tribe members, while gradually interweaving itself into the local system.

Governmental and nongovernmental groups that have tried to get involved in Seri natural resources management, where highly political and economic interests are at stake among participating actors, have not been able to engage in effective cooperative schemes with the Seri Traditional Government and the Seri Community.

Based on the support networks already developed with the tribe, CoBi is now taking a more active and influential role in the development of participatory management schemes. The organization has recently initiated a project using economic incentives to modify the current extractive and commercialization process for the swimming crab fishery in favor of more sustainable practices. The goal of this project is to obtain a certification standard from the Community Based Certification of Fisheries Program (CBCF) of the World Wildlife Fund (WWF-US) Endangered Seas Campaign that will allow the product to be labeled as sustainable and achieve higher prices in the market. The effects of this project on the structure of local Seri institutions are still not known. However, it is acknowledged that the project could affect the power structure and bargaining relations among the local actors. In that case CoBi would be well situated to act as facilitator to conduct the conflict resolution process, ensuring that the momentum created around the project is not lost. It is also possible that CoBi becomes involved in

the conflict itself, and risks being expelled. Avoiding this scenario will depend on the strength of their reciprocity network with the tribe, among other factors. The potential benefits clearly overcome the costs, since the process could generate wider networks of collaboration towards a more tangible co-management system.

Nevertheless, for many organizations interested in protecting marine biodiversity the use of the methodology explained above seems to be considered of little value. Obtaining initial funding is challenging. It is important that these institutions recognize the negative effects of mishandling local participation, and that the only way to end this process and achieve long term conservation results is supporting real local participation from the beginning, as part of the project design. This process takes time, resources, a multidisciplinary effort, and is usually based in a trial and error learning experience.

We believe that the methodology being developed by CoBi can be replicated in other CPR settings in Northwest Mexico, since it's already proving to be successful in a highly conflictive setting such as the Seri.

Moreover, the use of anthropology, biology, and institutional analysis techniques for biodiversity conservation is a niche that hasn't been exploited in Mexico by conservation organizations, and could prove to be a rewarding strategy to approach the actual dilemmas that the small-scale fisheries are facing to conserve their CPR in Mexico. Conservation organizations interested in this approach need to adapt their financial, organizational, and technical capabilities in order to be able to adjust to the characteristics of each determined setting. The structure of each setting becomes visible only once the organization has identified the main characteristics of the physical, cultural, and institutional setting affecting the CPR's appropriation and provision (Ostrom 1990).

The process of generation of basic biologic baseline data relevant to the management of the resource can be used effectively to promote local participation and create tangible starting points for the involvement of local fisheries authorities and resource users. This is easier to achieve if local participation is envisioned as part of the project design. Having promoted the process, it is much more feasible for the NGO to act as a facilitator

and mediator in local conflict resolution arenas, and to propose feasible conciliatory schemes.

## **CHALLENGES AND DIFFICULTIES**

Co-management processes and institutional change are measured in decades not in years, therefore, this strategy could be too lengthy to be used in settings where rapid deterioration of the resource is taking place. These circumstances would need the use of other strategies that allow rapid change of current conditions. The initial stages of the co-management process where information gathering, organization, and rule making take place, can be very costly, imposing further limitation towards the use of this strategy.

The use of co-management strategies won't be appropriate for all settings and all circumstances. A careful analysis of what Ostrom (1997) characterized as the appropriator and resource characteristics of the setting, could be very useful to determine in a broad way, the feasibility of a potential setting.

To talk of the construction of a true co-management regime in Seri territory is to talk about breaking a rational equilibrium that has been reached between the Seri and the Mexican government while facing their problems of collective action through the years. Such equilibrium evolves as a result of self-reinforcing distrust, exploitation, and defection as norm of interactions between individuals, up to the point that becomes irrational for them to act differently (Putnam 1993). In this context the conflicts between Seri and Mexican fishermen could continue in permanent stable equilibrium, until the commercial extinction of the marine common pool resources in the Infiernillo Channel takes place.

In some case studies throughout the world, the emergence of a co-management system has only been triggered by a resource crisis (or what the appropriators of the resource perceive it to be) (Blomquist 1992, Putnam 1993, Singleton 1998).

## CONCLUSIONS

Members of CoBi have decided to follow a different path towards natural marine resources conservation in Northwest Mexico, in the light of the observed negative effects of previous conservation strategies. Evidence of the increased awareness of the potential of co-management systems among other NGOs in the region rests in the inclusion of the subject in the regional conservation agenda.

Although it has been acknowledged that co-management systems are not suitable for all settings, through the use of this strategy, members of CoBi have demonstrated the importance of highly participatory strategies designed to engage mutual reciprocity relationships with members of small-scale fishing communities. In these communities, conservation strategies will only succeed when matched with the institutional structure of local institutions, or when transformation of these structures becomes possible through a crisis scenario.

Working methodologies that value high budget investments on time and resources to understand the local system before gradually increasing their level of involvement in the community, should be further analyzed and tested in other CPRs, and among different small-scale fisheries settings to better understand its applicability and dimension for future resource and biodiversity conservation purposes.

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## APPENDIX

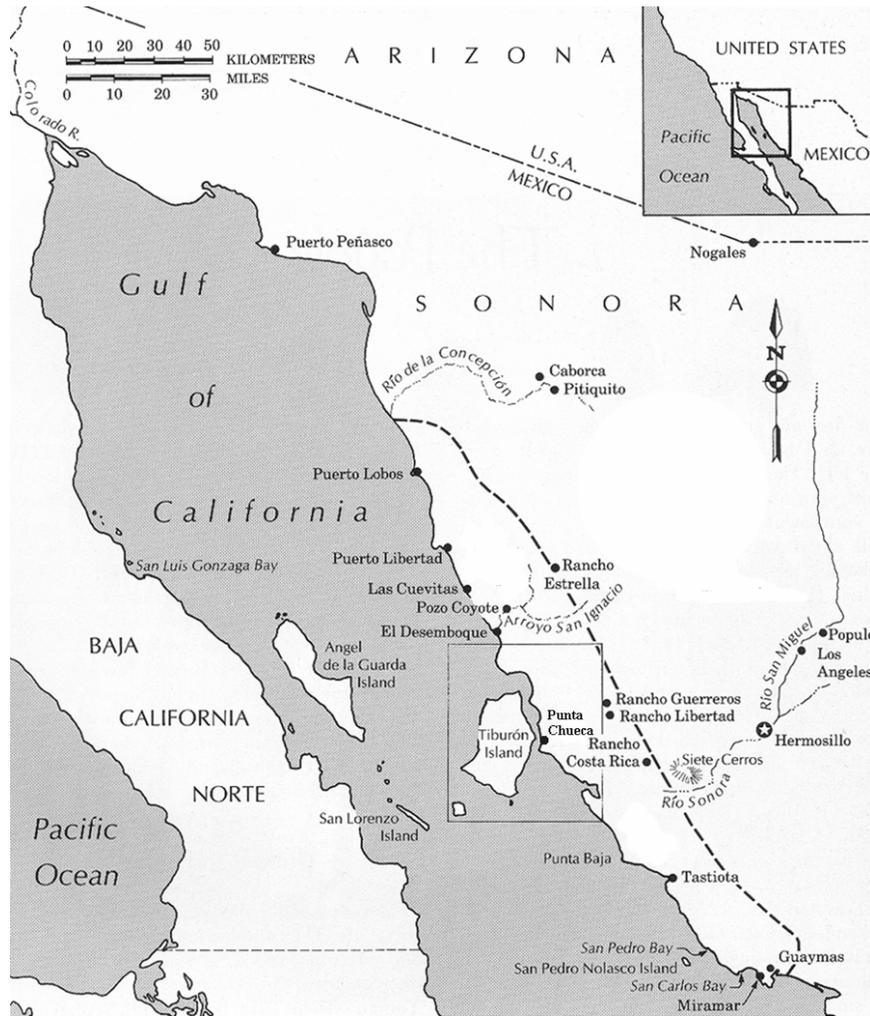


Fig. 1. The Midriff Island Region of the Gulf of California including the Infiernillo Channel, which is situated between Tiburón Island and mainland. The channel is 37 km long and from 2.7 to 11 km wide. Seri fishermen concentrate their fishing efforts in this area and have devised access and exclusion rules for non Seri fishermen. The dashed line shows the original range of the Seri territory. Today the Seri population is concentrated in the two modern villages of “El Desemboque” and “Punta Chueca”, which are also shown in this map. Modified from Felger and Moser (1985).