

**A New Marine Resources Conservation Management Approach in Baja California Sur (BCS), Mexico: An evolving case study.**

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**Introduction**

Marine resources constitute a major component of the economy of the Mexican state of Baja California Sur (BCS). Fish and shellfish are harvested for local consumption in hotels, restaurants and resorts. These businesses in turn service domestic and international tourists who provide the single greatest source of economic input to the state. Sportfishing and other ecotourism activities have formed the basis for the growth of tourism in BCS over the last 30 years. In 1995 sportfishing for billfish (blue, striped and black marlins, sailfish, swordfish) generated an estimated \$99,926,807 in economic impact to the state of Baja California (Ditton, *et al*, 1996)). Whale watching, diving and other marine resource focused activities provide additional value to the local economies of BCS, and many such activities benefit from a number of BCS MPAs established by federal and state regulations including the Revillagigedo Islands, Complejo Lagunar Ojo de Liebre, Bahía de Loreto, Cabo Pulmo, Islas del Golfo de California, and the Estero San Jose.

Along the Pacific Coast of Mexico and within the Sea of Cortez (or Gulf of California), as is the case with the rest of the world's oceans, most marine fish stocks have been subjected to overexploitation and current stock levels are a fraction of what existed 40 years ago (Ramirez 1988; Pauly et al 1998; Dayton et al 2002; Myers and Worm 2003; Nelson 2004). Commercial landings have declined and catches have shifted to less preferred species, lower trophic level species (Pauly et al 1998; Sala et al 2004). Pelagic longline fisheries and bycatch mortality have been identified as a major cause of reductions in the encounter and catch rates for striped marlin in the mostly catch-and-release BCS sport fisheries (Squires and Au 1988). The most popularly cited causes for declines in the fish resources of BCS had been open access to commercial fisheries, limited data collection, insufficient technical assessment and monitoring resources, a general absence of fisheries management expertise and effort and a serious lack of enforcement of existing regulations.

In 1999 ecotourism interests in BCS joined with similar interests from the other states surrounding the Sea of Cortez and actively sought to confront what were perceived as serious declines in billfish resources and other fisheries. A focal point of this effort was to renew the efforts of La Fundación para la Conservación de los Picudos, A.C (FCP), a non-profit conservation organization which had been previously influential in securing establishment of significant conservation zones constituting the largest marine protected area (MPA) within Mexican waters (Figure 1 and 2). Although established primarily to protect finfish species important to the Mexican sportfishing fleets, these extensive zones wherein large scale (i.e. drift gillnet, longline) commercial fishing gears are prohibited have provided significant protection for sharks, sea turtles, marine mammals and other finfish species commonly taken as bycatch by these gear types.

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Federal elections in 2000 were looked at to provide a new opportunity to focus attention on the flaws in fisheries management and the general lack of planning devoted to economic development in the context of tourism and marine resource use. The launching of a major marine tourism development program, “Escalera Nautica,” that proposed expanding nautical tourism infrastructure throughout the Sea of Cortez and the Pacific Coast of Baja California was seized upon to raise the profile of marine conservation issues by linking marine conservation with the development of economically beneficial low impact ecotourism activities to emphasize that the success of such a venture was ultimately dependent on the protection and conservation of marine resources and the habitats that supported them. The largely skeptical reaction to “Escalera Nautica” from the Mexican conservation community was seen by FCP and TBF as creating an opportunity to publicly explore a broad range of marine conservation issues with the federal government through a strategy of linking marine conservation and sustainable economic development.

### **Initial Process Evaluation**

In 2000 PESCA (then the Mexican fisheries agency) proposed issuing 48 permits to allow “experimental” longline fishing within the existing marine conservation areas. The permits were ostensibly to allow the harvest of sharks and swordfish. No assessments were provided on the status of either stock. No existing management plan existed for either species, although swordfish had been subject to the protections provided by the conservation zones established in 1987 and 1994.<sup>3</sup> Previous research with experimental shark longlining within the conservation zones had shown that 90% of the actual catch was sailfish and marlin; the very species the conservation zones were established to protect (Arenas, *et al* 1999). This proposed action by the federal fisheries agency prompted FCP to seek the assistance of The Billfish Foundation (TBF), an international conservation organization focusing on the conservation and sustainable management of billfish and marine pelagic ecosystems.

TBF offered resources and expertise in fisheries ecology and management and entered into a partnership within Mexico with FCP. Initial efforts to avoid the new longline permits were successful, and it was determined that an overall evaluation of the process dynamics and policy directions of fisheries management in Mexico was a necessary first step in approaching a broad range of fisheries conservation issues. The evaluation of existing processes was undertaken through a review of fisheries law and regulations, interviews with federal marine fisheries and protected resources officials, commercial, sportfishing, academic and marine conservation interests and a review of published and unpublished fisheries data and research conducted by the national fisheries institute (INP) and academic institutions. The evaluation focused on five areas: fisheries management, data collection and research, enforcement, program funding and political influences. In this undertaking collaboration with SEAWATCH allowed for an expansion of this effort to include a broader scope of fisheries and fishers in the process.<sup>4</sup>

The evaluation concluded that the fisheries management system in Mexico was constrained by numerous structural, process and political elements (Table 1). The centralized federal management system was isolated from regional input and operated without transparency or

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<sup>3</sup> Diario Oficial de la Federación, Organismo del Gobierno Constitucional de los Estados Unidos de México; viernes 28 de agosto de 1987; miércoles 16 de marzo de 1994.

<sup>4</sup> SEAWATCH ([www.seawatch.org](http://www.seawatch.org)), a marine conservation organization with special interest in the northwest Mexican Pacific and the Sea of Cortez, provided resources and expertise focusing on interviews with recreational, commercial and artisanal fishers. The active participation by enforcement attorneys and officers from PROFEPA and the Mexican Navy contributed to this effort.

solicitation of broad-based constituent input. Interactions between the sport fishing/ecotourism sectors and government officials were most often characterized by conflict, with little real communication. Managers generally had not attempted to determine levels of sustainable yields, there were essentially no regulations in place limiting commercial harvest or effort. Data collection and applied fisheries programs, with the exception of the internationally managed tuna fisheries, were minimal, lacked coordination among federal agencies and academic institutions and could not be used for modern fisheries management programs. Existing enforcement resources were not sufficient. In some cases quasi-legal “permits” were routinely issued to allow fishing activities<sup>5</sup> within protected areas. Well organized commercial fishing interests dominated the political arena and subsidies on vessels, engines and fuel. Federal tourism officials were ill-advised on the nature of sportfishing and ecotourism in Mexico. Traditional conservation organizations had not looked far beyond protected species and habitat issues in the marine fisheries agenda.

Anecdotal information collected from a wide range of tourism and sport and commercial fisheries participants generally showed a wide-spread belief that major fishery resources had been substantially diminished, that these reductions in abundance were having substantial negative economic impacts and there was little hope for substantial changes in the way fisheries were managed. Commercial fishing activities, often fueled by government subsidies, were largely overcapitalized and struggling to exist on a diminishing resource base, a conclusion also reached by a subsequent economic study by El Colegio de Mexico (Leon 2004).

These results forced the conclusion that in order to achieve substantial advances in fisheries conservation major changes were needed in the processes of attempting to influence fisheries managers and the processes by which management decisions were made. In particular the two organizations determined that it was necessary to:

- 1) expand the support base for marine conservation by including Mexico’s tourism industry and the offices of the Secretary of Tourism;
- 2) increase the transparency of decision making and input from constituents in the management process and transform conflicts into positive interactions;
- 3) continue to resist efforts to undermine the few conservation safe guards already in place;
- 4) promote an increased enforcement presence and conservation commitment;
- 5) secure a stronger voice for sportfishing and conservation interests through educational campaigns intended to inform the public and conservation community about existing marine fisheries problems; and
- 6) gain increased influence over data collection, research and enforcement efforts by seeking control over the use and distribution of license fees.

### **Initiating Fisheries Management Reforms**

In January 2001 successful interactions with Congress succeeded in raising the profile of fisheries conservation issues and led to placing the 50 mile conservation zones into federal law<sup>6</sup>. The impediments to effective fisheries management identified in the initial evaluation process were detailed in briefing documents prepared for Congressional committees with jurisdiction over

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<sup>5</sup> For instance PESCA had routinely issued permits to U.S. based long range sport fishing vessels ostensibly allowing them to fish within the no-fishing zones surrounding the Revillagigedo Islands. The revelation of this practice forced the agency to suspend the permits in 2002.

<sup>6</sup> Prior to this time the conservation zones had been established in regulations developed by PESCA. The status of federal law provided greater security against changes to the zones.

marine fisheries and environmental issues and a focused effort was made to educate lawmakers on the need for reform of the basic fisheries process.

Attempts to broaden the political and economic base of support for fisheries conservation in Mexico were initiated in 2000 and 2001. A presentation on the potential economic value of sportfishing tourism and the protection of the 50 mile conservation zones and the need for adequate marine fisheries conservation measures was made to government and private industry tourism interests at the annual *Tianguis*<sup>7</sup> in Acapulco in April of 2001. The use of this forum emphasized the positive tourism and economic aspects of good conservation and led to strong ties with the office of the Secretary of Tourism and increased support from various Mexican Hotel and tourism interest groups. Serendipitously, a number of incidents of marine mammal and sea turtle interactions with longline and gillnet gear occurred during this timeframe and they received widespread media attention in both the press and television. SEAWATCH utilized its website to document these incidents and maintain an information base which catalogued the critical issues facing fisheries and resource declines in the Sea of Cortez and the Pacific Baja coast. The cumulative impact of these efforts allowed for a real increase in the interest in Congress for increased oversight of PESCA and marine fisheries in general.

During 2001 two key congressional Committees initiated a series of 25 public meetings across Mexico to receive input on the state of fisheries and fisheries management. FCP and TBF were able to use these opportunities to present reviews of scientific and anecdotal information and to enlist the support of local marine fisheries and tourism interests along the Pacific coast to join our campaign for fisheries reform. The end result of this work was legislation which replaced PESCA with a new commission that would be responsible for supervision of marine fisheries and aquaculture - CONAPESCA<sup>8</sup>.

This new commission now includes representation from the Secretaries of the Environment and Natural Resources, Economy, Communications and Transportation, the Navy and Tourism (*Consejo Tecnico*) in oversight roles along with the offices of the Secretary of Agriculture that had traditionally housed PESCA. The involvement of a broad range of Cabinet level offices in fisheries has served to increase the transparency and accessibility of the management process. CONAPESCA was created with a citizens advisory committee (*Consejo Nacional de Pesca y Acuacultura*) that included, for the first time, representation from the sportfishing sector in an official capacity. An upper level position as coordinator of sportfishing (*Coordinador de Pesca Deportiva*) was designated within Conapesca to allow for closer ties with the recreational fishing community.<sup>9</sup> Additionally, advisory commissions (*Consejo Estatal de Pesca y Acuacultura de Baja California Sur*) consisting of all interests affected by fishing have now been established in BCS and are being organized in other coastal states. A national organization sanctioned by the federal government was created to represent the interests of marine-related tourism, sport fishing and boating interests (*Comision Nautico-Recreativa y de Pesc Deportiva*) These changes have dramatically increased the opportunities for local input into the federal process. They have furthered our goal of moving decision making closer to the people whose daily life is dependent on the health of the sea. Fisheries officials now meet regularly with these advisory groups to receive input on management and enforcement needs.

The re-organization of federal marine fisheries management has not provided a panacea to all the problems originally identified, but it has created a new process where participation and

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<sup>7</sup> The annual Mexican *TIANGUIS* is one of the world's largest tourism industry marketing conventions.

<sup>8</sup> La Comision Nacional de Acuacultura y Pesca.

<sup>9</sup> At the time this paper was submitted an appointment to this position is anticipated.

transparency mark positive changes to a previously closed process. In the last year CONAPESCA has adopted the framework for establishing an electronic vessel monitoring system (VMS) for large commercial vessels. Such VMS systems are an essential ingredient for the enforcement and success of marine protected areas and conservation zones. The new management process was used by SEAWATCH and others to present information on existing VMS systems, bring in experts to discuss the use of such systems with CONAPESCA officials, and ultimately to persuade CONAPESCA that such a system is needed in Mexico. To date efforts to allow up to 240 new longline vessels to fish within the conservation zones and the entire Gulf of California have been successfully countered., although this issue remains a very real threat.

### **Funding Research and Enforcement Initiatives**

Two key problems highlighted in the evaluation process were the lack of conservation based science and research and adequate enforcement for existing conservation regulations. A lack of “scientific proof” of overfishing was often cited by federal officials as the reason for not proceeding with harvest controls. The benefits of MPAs were being diluted by a lack of compliance and enforcement of regulations controlling activities in these areas. During 2003 and 2004 FCP and TBF engaged in negotiations with the federal and BCS governments over the possibility of developing a pilot program to allow for the use of recreational license fees to fund marine fisheries research, enforcement and conservation education needs on a local basis. Last November this effort ended with agreement that license fees collected in BCS will be placed into a trust fund (FONMAR <sup>10</sup>) under the supervision of a committee consisting of private sportfishing, tourism and conservation interests and state and local government officials. The license funds placed in the trust are to be used to enhance and expand data collection, marine research, enforcement and public outreach and education programs. It is estimated that a minimum \$300,000 annually will be raised through license for these purposes.

In tandem with FONMAR we have chartered a Center for Marine Protection to be based in La Paz. This Center will function under a Board of Directors consisting of the private sector representation on the Board of FONMAR and a Scientific Advisory Committee. The Center will determine program priorities and establish a grants application process to review and make recommendations for funding by FONMAR. The Center will also take an advocacy role in working towards increased protections for the marine environment. The main goals of this Center are to:

- 1) focus scientific investigation and fisheries data collection on marine resource problems of most immediate need and with the highest probability of presenting results of utility for developing conservation regulations;
- 2) enhancing and expanding existing enforcement efforts; and
- 3) increasing public understanding of marine conservation needs and compliance with existing fisheries regulations, protected area designations, and best practices to minimize impacts of fishing activities on resources and the environment. These goals are necessary

to achieving the overall objective of restoring the marine resources in the waters of BCS. The Center’s activities will serve as a pilot program to be used to influence the creation of similar ventures in other Mexican coastal states.

The Center for Marine Protection will use no public (license) funds for administration or conservation advocacy. These functions will be funded through private donations. FCP and TBF believe that the success and expansion of this BCS endeavor will require an absolute objective and apolitical approach towards the use of FONMAR trust funds in a manner which will

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<sup>10</sup>Fondo para la Proteccion de los Recursos Marinos

demonstrate that local action and private sector leadership can be effective in addressing marine resource problems.

**Research** proposals for applied fisheries and ecological research will be entertained from the academic, private and governmental sectors on an annual basis. Proposals will be evaluated against priorities established by the Center's Scientific Advisory Committee and adopted by the Center's Board of Directors. The Center will make formal recommendations to FONMAR for the funding of these proposals. The Center will also serve in a fiscal and technical oversight capacity to periodically review progress on funded projects and evaluate annual results. These evaluations will be presented to FONMAR in annual reviews of the funding chopicies.

**Enforcement** enhancement may be provided through proposals presented by existing (CONAPESCA, SEAMARNAP, Navy) enforcement entities for additional resource needs identified as critical to achieving effective enforcement of existing fisheries regulations and protected areas designations. The principal enforcement program currently under development with the Center will be through the *Guardianes de Mar* (GDM) program. This effort to establish local stewardship and participatory enforcement by members of the commercial and recreational fishing and tourism communities of BCS will focus local expertise on identifying areas and activities which are in non-compliance with existing conservation laws or threaten to create new resource problems through the use of new and unregulated gear types or fishing activities. Individuals will be trained in fisheries law and the requisites for collecting information necessary to establish the legal basis for filing charges against observed violators. Efforts are currently underway to establish GDM

The Center will coordinate this local, "on the water" expertise with existing enforcement entities to reduce the extent and magnitude of violations and identify new regulatory needs. When fully implemented the Guardianes program will have the capability of collecting fisheries data and increasing the ability of existing state and federal agencies to implement effective resource management programs for the waters of BCS. Enforcement officials in PROFEPA<sup>11</sup> have already prepared the legal format, instructional materials, and accreditation standards applicable to individuals in the program. The Attorney General has authorized participation of PROFEPA attorneys in assisting in the development of this program in BCS, and progress is underway to establish the first Guardianes del Mer in the coming months.

**Education and Outreach** efforts will be coordinated by the Center to increase the level of public understanding of conservation needs and support efforts to develop the best standards and practices for fishing and other ecotourism activities with impacts on the marine environment. Initial efforts are underway to produce a placard to be placed on every sport fishing vessel in Los Cabos that explains the need for billfish conservation through catch-and-release fishing.

### **What Lies Ahead**

Definitive progress has been made in changing the form of fisheries management in Mexico and in creating real opportunities for enhanced marine resource management, protection and conservation in BCS. However, many of the underlying problems with management and enforcement remain. We now must establish the legitimacy of the FONMAR/Center for Marine Protection program as an effective and politically neutral means of improving marine resource management and conservation. There remains some skepticism in the federal government over allowing local control over publicly collected funds.

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<sup>11</sup> The enforcement office of SEMARNAT – The offices of the Secretary of the Environment and Natural Resources.

This skepticism has, for now, prevented FONMAR from securing permission for an internet license sales system which would ultimately make it much easier to buy licenses, increase total license sales and expand the pool of available funds for conservation projects. Successful implementation of the Guardianes del Mer program will likely serve as the most public display of the overall success of the new program in BCS. Spreading the ideas and actions taking root in BCS to other coastal will be a necessary component of achieving conservation success on a national level.

We have only begun to utilize the new management process through CONAPESCA. It is imperative that we continue to educate and inform the Cabinet offices sitting on CONAPESCA to assure that a balanced but conservation-positive policy towards management is allowed to grow. Efforts will continue to increase interactions with non-fisheries Cabinet officials on the economic value of promoting sustainable fishing practices. It will be necessary to insure that the processes developed through the creation of CONAPESCA are not lost during any transition in administrations that may occur following the next Presidential election.

The Center has begun discussions with the Instituto Mexicano de la Competitividad-IMC to develop a comparative economics study on the social, economic and environmental value of regulated and sustainable sport fishing tourism.

TBF has pledged support for the Center through the services of a scientific and management advisor. Efforts to raise private funds for grant matching, administrative and advocacy work will be needed to assure the success and permanency of this endeavor. TBF has begun a parallel project in Costa Rica to attempt to develop a similar approach to enhancing that nation's marine resource management potential.

### **Conclusions**

This project has succeeded at demonstrating that linking conservation and economic goals by coordinating scientific fact based activism by conservation and tourism interests can move local initiatives to the national level in Mexico. The collapse of the economic vitality and competitiveness of Mexico's commercial fishing industry (Leon 2004) has been contrasted with the dynamic and highly competitive possibilities of sustainable sport fishing and ecotourism activities based on sound resource management and a strong international market.

The federal government has been persuaded to allow a novel approach for local control of research, enforcement and education efforts funded by license fees. The funding available to the new Center for Marine Protection will enhance the enforcement, compliance and effectiveness of the various MPAs in the waters surrounding BCS. The framework for these processes is now in place and the development of a new paradigm for marine resource management is a reality in BCS. The success of continued efforts will lay in the hands of participating concerned local citizens who understand the stake that healthy marine resources have in their economic and social well being.

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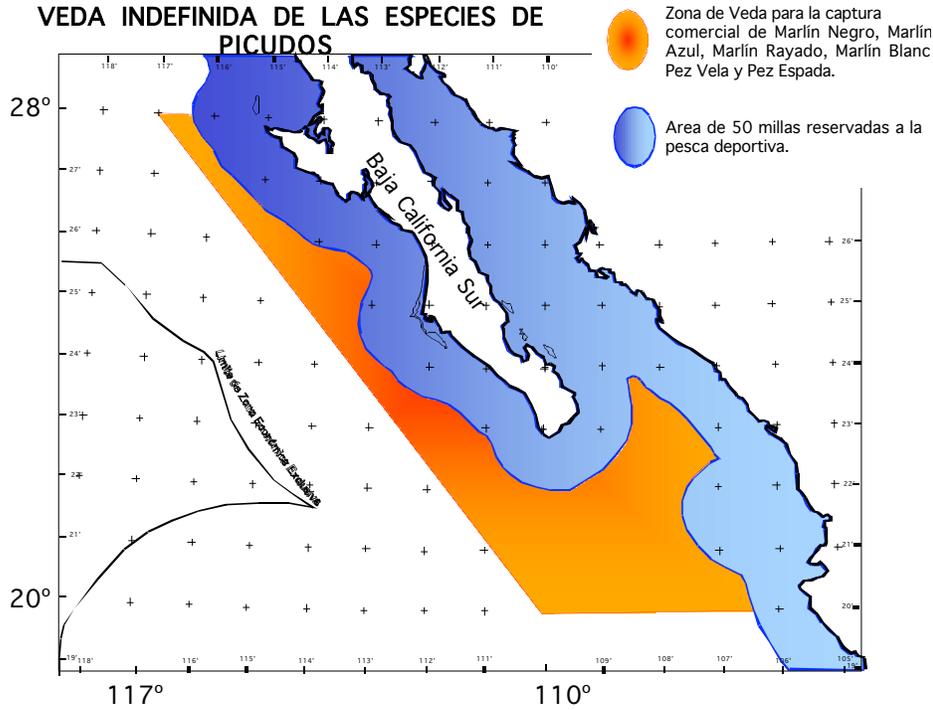
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**Figure 1. Mexico’s existing 50 mile conservation zone (blue) limiting harvest to sport fishing and artisanal commercial gears; The “Core Area” conservation zone (orange) off Baja California Sur established to protect billfish (Black, striped and blue marlin, sailfish and swordfish) stocks.**



**Table 2. Southern fisheries conservation zone. Regulations as per orange zone in Figure 1.**



**Table 1. Results of Initial Fisheries Management Process Evaluation**

<b>Process Category</b>	<b>Problem Identified</b>
<b>Fisheries Management</b>	Insulation of management decisions under an Undersecretary for fisheries (PESCA) limited transparency of decision making
Fisheries Management	Little intergovernmental collaboration on fisheries issues
Fisheries Management	Isolation of management under federal control limited regional input
Fisheries Management	Strong influence by organized commercial fishing interests
Fisheries Management	No formal pathways for constituent input into management decisions
Fisheries Management	Little understanding of sportfishing and conservation needs and interests within fisheries agency
<b>Data and Research</b>	Few standardized landings data programs (tuna an exception)
Data and Research	No long term recreational landings, catch and effort data collection
Data and Research	Little research by federal fisheries institute on sport fishing species
Data and Research	Tuna fleet observer program could provide model for expanding data collection
Data and Research	Little nexus between federal research and fisheries management needs, lack of forecasting
Data and Research	More use could be made of academic resources for applied fisheries research
Data and Research	Little emphasis on fisheries economics, social dynamics
<b>Enforcement</b>	Multiple authorities with distinct jurisdictions (PESCA, PROFEPA, NAVY) but lack of close coordination
Enforcement	Little attempt to integrate management tools with enforcement resources and capabilities
Enforcement	Severe lack of fiscal and personnel resources
Enforcement	Enforcement of existing conservation measures inadequate to prevent significant violations or promote wide-scale compliance
<b>Program Funding</b>	Total fiscal resources inadequate for modern fisheries management
Program funding	Sport fishing license fees to federal treasury, not dedicated to management needs
<b>Political Influences</b>	Commercial fishing interests well organized, politically active
Political Influences	Mexican conservation groups not focused on non-protected species fisheries issues
Political Influences	Sport fishing interests with little organization, affect on fisheries issues
Political Influences	Unplanned for and extensive subsidies encouraged severe overcapitalization
Political Influences	No organized tourism interests active in fisheries issues