Proposal to:

The David and Lucile Packard Foundation
Conservation Program: Mexico

For:

Sustainable Development Practices in Priority Coastal Environments of the Gulf of California Ecosystem:

Recreational Marinas and Shrimp Mariculture

Submitted by:

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SUSTAINABLE DEVELOPMENT PRACTICES IN PRIORITY COASTAL ENVIRONMENTS OF THE GULF OF CALIFORNIA ECOSYSTEM: RECREATIONAL MARINAS AND SHRIMP MARICULTURE

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TABLE OF ACRONYMS AND GLOSSARY

AMMT	*Asociación Mexicana de Marinas Turísticas*, Mexican Marina Association
CCD	Conservation and Development Commission for Bahía Santa María
CIAD	*Centro de Investigacion de Alementacion y Desarrollo* Research Center for Food Development.
CIMEX	Conservation International, Mexico
CRC	Coastal Resources Center, University of Rhode Island
Ejido	Agrarian community composed of twenty or more individuals who received and manages lands expropriated during the Mexican Revolution
EN	*Escalera Náutica,* Nautical Route
FONATUR	*Fundo Nacional de Túrismo,* National Tourism Development Fund of Mexico
GAA	Global Aquaculture Alliance
GMP	Good management practice
ISA	Sinaloa Aquaculture Institute
NGO	Non-Government Organization
OEM	*Ordenamiento Ecológico Marino*, Marine environmental plan
OET	Terrestrial environmental plan
SEMARNAT	*Secretaria de Medio Ambiente y Recursos Naturales,* Secretary of Environment and Natural Resources
UHH	University of Hawaii-Hilo
URI	University of Rhode Island
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
WWF	World Wildlife Fund
ZOFEMAT	Federal Marine and Coastal Zone Agency

SUSTAINABLE DEVELOPMENT PRACTICES IN PRIORITY COASTAL ENVIRONMENTS OF THE GULF OF CALIFORNIA ECOSYSTEM: RECREATIONAL MARINAS AND SHRIMP MARICULTURE

PROPOSAL

Statement of the Challenge and Opportunity

Throughout the 20th century agriculture, fisheries, transportation and manufacturing fueled the growth of the northwestern coastal region of Mexico surrounding the Gulf of California. Cities and communities along the coastal plain of the Gulf of California and Baja California peninsula have benefited from this development, but also are paying a price. This includes coastal resources – which have been affected by damming of river flows, conversion of coastal lands through urbanization, curtailed public access, water pollution, overfishing, social conflicts, destruction of habitat and loss of species.

Now, in the 21st century, coastal tourism and shrimp mariculture are emerging as two of the most important growth industries for the region. Government, civil society and the private sector are, in response to this growth, are recognizing the need to balance natural resource conservation and equitable economic opportunity. As well, there is increased recognition of the need for a concerted effort to build support and capacity for the design and adoption of sustainable forms of tourism and/or aquaculture development.

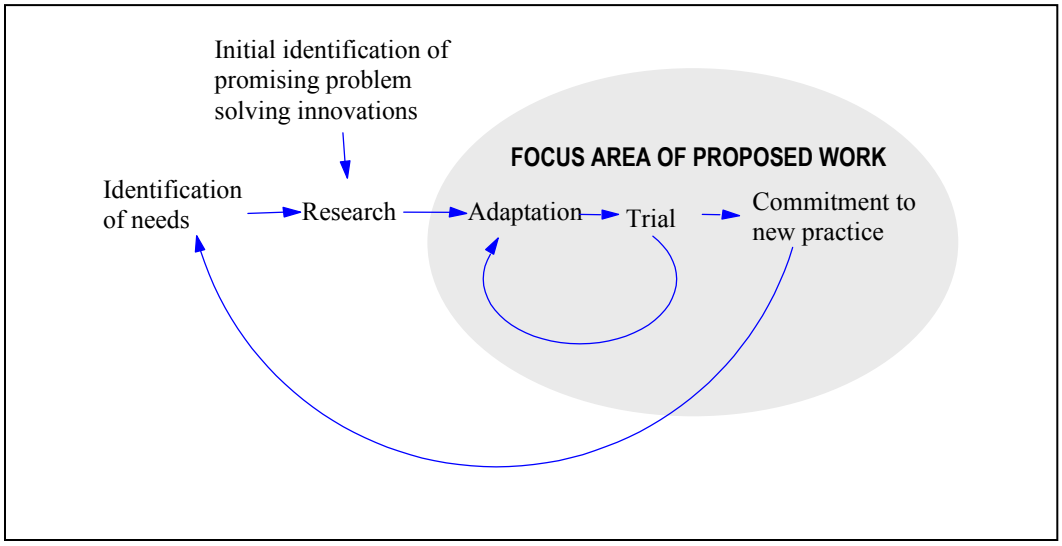
During the 1990s, Mexico attempted to carry out integrated programs with the private sector that would provide infrastructure and take advantage of economies of scale in "aquaculture parks" and "tourism corridors". It was expected that better planning combined with the execution of these projects would also greatly reduce environmental impacts. Environmental planning and regulation initiatives for the coastal zone of the Gulf of California – initiatives such as the *Ordenamiento Ecológico Territorial* (OET) – were conducted at the regional, state and local levels, in an effort to create a more predictable framework for development of the productive sectors, such as tourism and mariculture. Mexico has also made extensive use of its environmental impact assessment tool, especially in areas that do not have environmental plans.

Some important progress has been made in identifying and protecting high priority areas for conservation and restoration of the Gulf of California. A recent example is the Coalition for the Gulf of California's Conservation Priority-setting Workshop in May 2001. This workshop helped identify areas of high bio-diversity importance in terms of use trends, conflicts and threats. Another example is the Gulf Islands Park program which has published general regulations for the 900 plus islands within the National Park system in the Gulf region, has adopted management plans for some of the major islands and has helped promote the designation of some critical locations as marine protected areas. Yet in spite of these examples of progress, few of the coastal use and regulatory plans have been completed, leaving coastal communities – which now have a potentially stronger voice in how coastal ecosystems are utilized – at a disadvantage in making sound decisions.

Following the February 2001 announcement of a proposal to create a 22 marina Nautical Stairway, national and state officials are pressing to complete a Gulf-wide *Ordenamiento Ecológico Marino* (OEM) which will set priorities for the use of the entire marine and coastal area. This announcement has also prompted states such as Sinaloa to reactivate and complete coastal environmental plans to address mariculture and coastal tourism development.

To be effective this time around, the regulatory approach needs to incorporate the extensive body of well-documented and internationally recognized good practices for both marina tourism and mariculture. These measures can prevent and minimize impacts to the environment while promoting a sustainable industry. Such practices have been thoroughly tested in the United States, Europe, the Caribbean and Latin America and they are needed in the Gulf. Regulators also need to recognize that successful implementation of sustainable development policies for mariculture and tourism requires the acceptance and voluntary adoption of good practices by the private sector. This in turn is a sustained process of adaptation, trial and commitment (Figure 1).

Figure 1 General Approach to Introducing Innovations[1]



For mariculture, Dr. Claude Boyd outlines a three step process which has been successful in many countries: (1) articulate and adapt an industry-wide code of conduct, (2) specify the good siting and operation practices which exemplify the code, and (3) prepare and make available the operational guidance which firms and managers require in order to successfully apply and retrofit their operations to follow the industry good practices.

State and municipal regulatory programs can be designed and managed to both maintain high standards for development and foster the voluntary adoption of "good practices". This proposal incorporates both of these approaches.

[1] Everett Rogers. 1995. *The Diffusion of Innovation*. The Free Press.

History, Role and Commitment of the Coastal Resources Center and its Partners to Good Practices for Coastal Development in the Gulf of California

The mission of the Coastal Resources Center (CRC) of the University of Rhode Island (URI) is to develop and promote more effective approaches to sustainable coastal ecosystem management worldwide.

CRC was established in 1972 by the Governor of Rhode Island to assist local governments and communities in addressing coastal management issues within the state at a time of economic crisis. Military installations were being abandoned, and business leaders and public officials proposed the construction of nuclear power plants, oil refineries, deep-water ports and offshore oil drilling bases to fill the employment gap. CRC helped Rhode Island's Coastal Resources Management Council develop one of the first coastal management plans in the United States, setting the framework for an alternative development path that avoided the construction those unwanted facilities. Rhode Island's coastal plans and regulations have been revised and refined to make it as clear as possible where development can take place, what forms of use are acceptable and the preferred design and engineering approaches. Since the 1980's, CRC has worked with the marina industry, citizens and town governments to put order into the state's recreational harbors and other special areas, including coastal lagoons and urban waterfronts, contributing to conservation of coastal features and restoration of polluted estuaries.

In 1985, the US Agency for International Development (USAID) asked CRC to bring its expertise and experience in addressing US coastal management issues to pilot projects in three developing countries—Thailand, Sri Lanka and Ecuador. CRC's coastal management portfolio within the US and internationally has continued to grow and now includes programs in the United States, East and Southern Africa, Indonesia, Central America, and Mexico.

Good practices and operational guidelines are featured in CRC coastal programs in several of these locations:

The Tanzania Coastal Management Partnership formed a multi-disciplinary Mariculture Working Group to prepare a profile of issues and specific mariculture development guidelines with stakeholder and industry support. These guidelines are now being utilized by several agencies.

The Conserving Critical Coastal Ecosystems in Mexico project compiled "Guidelines for Low-Impact Tourism along the coast of Quintana Roo, Mexico." Many of these guidelines were included in the Costa Maya OET, featured in several training courses, and endorsed by the Secretary of Environment. They are also currently being incorporated into criteria for environmental impact assessments.

In collaboration with a University of Hawaii at Hilo (UHH) consortium, the U.S. Department of Agriculture and USAID supported work with the shrimp mariculture industry in Honduras, leading to a good management practices manual that appears to sustain a high rate of adoption and continued use.

The CRC and the UHH partnered with a number of leading shrimp culture specialists from U.S. Land Grant Universities in 2000 to pioneer a Training-of-Trainer effort for mariculture extension as part of the Central America Hurricane Recuperation effort. An intensive year long program of innovative classroom education and experiential training was coupled with institutional strengthening exercises to develop a corps of 50 trained shrimp specialists and two national inter-institutional committees that now oversee a program of good management practice (GMP) implementation for shrimp farmers in Honduras and Nicaragua. The success of this program is measured by the rapid adoption of GMPs by shrimp farmers and a greater level of institutional collaboration that has led to increased capability of the public sector both to regulate and assist the private sector[2]. This positive example serves as an important basis for the plan of work presented in this proposal.

CRC added a new dimension to its ecosystem governance and capacity building program in 1998 by initiating a partnership with Conservation International-Mexico (CIMEX), which maintains a profound commitment to conservation in the Gulf of California, and provides considerable expertise in conservation and biodiversity issues.

CIMEX, with major funding from the North American Wetlands Council, has established an innovative conservation and development plan and management arrangement for Bahía Santa María in the State of Sinaloa. As well, with funding from the Packard Foundation it has established an important program to address artisanal-fishing issues. CRC has contributed to both these efforts with funding from USAID.

CRC and CIMEX began their work with the shrimp mariculture industry in Sinaloa in 2001, through a mariculture good practices planning grant from the Packard Foundation and USAID's Hemispheric Free Trade Program. Efforts focused on adapting international experience in good practices for shrimp farm operation and siting.

And, at the regional level in the Gulf, CRC is using its experience in integrated coastal management as it works together with CIMEX, to explore ways to ensure a successful preparation process and implementation framework for the *Ordenamiento Ecológico Marino* for the Gulf. This effort will be an important step in the regional sustainable development strategy.

CRC views the emerging *Escalera Náutica* (Nautical Stairway) project as both a potential threat and a potential ally to biodiversity conservation and environmentally sound economic development. CRC and CIMEX initiated work in early 2001 to identify ways to use the *Escalera Náutica* proposal as an impetus for greater stakeholder participation, enhanced policy development, and improved environmental management in recreational harbors throughout the Gulf. An initial reconnaissance trip to the Gulf was carried out in November 2001 to assess the feasibility and desirability of launching a good marina practice initiative related to the *Escalera Náutica*. Insights from that effort form the basis of the recreational marina section of this proposal.

[2] Final Project Report, USDA Hurricane Mitch Reconstruction Program, CSREES Regional Integrated Shrimp Farming Program (AQ1-4). Project Leader: Gary L. Jensen

A hallmark of CRC work has been its long-term commitments to partners and collaborators. The work described in this proposal is best understood as an important contribution to what we envision as a five-year program of work that will involve complementary sources of funding as well as follow-up to this initial two-year effort.

Specific Request

The Coastal Resources Center seeks Packard Foundation funding for $412,967 over two years to support marine conservation of estuaries and related environments in Mexico's Gulf of California. The project will develop and promote adoption of good management practices for recreational marinas and shrimp mariculture by government, utilizing ongoing policy and decisionmaking processes; and by the private sector through influencing its discussions on facility siting and operations.

Packard Foundation funds will enable CRC to work closely with Conservation International-Mexico, who will co-implement the project, and other key groups in the region. During the first year of the project (through September 2003) a cooperative agreement with USAID Mexico will provide complementary support which will allow a focus on bay management demonstrations (Bahía Santa María), marina tourism in selected harbors (La Paz) and enhancement of regional governance capacity in the Gulf of California. CRC will work with CIMEX to carry out our overall strategy for the Gulf of California, and is actively pursuing additional funding to expand CRC presence, especially in the area of capacity building for coastal management.

Description of the Proposed Program and Objectives

Goal

This project will strengthen the knowledge, acceptance and adoption of environmentally, economically and socially viable practices for siting and operation of shrimp mariculture and recreational marina development in areas of critical environmental and social concern within the Gulf of California.

Strategy

Provide information on, offer recommendations regarding, and deliver training to policy makers on the improved siting and operation of mariculture and recreational marina facilities – to avoid negative environmental impacts and produce the greatest flow of benefits to local economies.

Encourage private industries in the mariculture and marina trades to identify and voluntarily adopt good practices. Initiate a robust network of researchers, businesses and resource stewards who support the transition to sustainable coastal uses. Specifically promote discussion of good

practice codes of conduct, identify good practices, and provide operational guidance and support to industry groups and public decisionmakers.

In association with CIMEX, maintain a sustained, supportive presence in the Gulf, aimed at elevating the level of interest and capability in good practice identification and adoption.

Objectives and Anticipated Outcomes

1. Specify sets of locally appropriate and feasible good practices for shrimp mariculture and recreational marina facility siting and operation with the full engagement of the industries and public officials.

The expected results are a reliable set of guidelines for both mariculture and marinas, which have credibility because they are based in part on local examples and initiatives. The process for preparing these documents will be a part of the process for motivating and creating local capacity for outreach and extension.

Proposed Outcomes:

- Good management practices are identified, refined, tested or implemented (will vary according topic and current status of GMPs).
- GMPs are accepted through consensus process including public and private sector, as practices which can reduce environmental damage through siting and operational recommendations.

2. Engage with ongoing decisionmaking processes at the national and local levels to advocate for the incorporation of good practice guidelines into public policy statements, plans and decision criteria, which relate to siting new projects.

Guidelines will be prepared in a form enabling their incorporation within the regulatory framework and pursue opportunities to productively engage in planning and public decisions in zoning and siting within the Gulf of California. Project staff and working group members will be continually identifying and participating in appropriate venues.

Proposed Outcomes:

- Linkages between private and public sector are strengthened through participation in working group activities, benefiting development of policy instruments and planning activities.
- Decisions and plans incorporate concepts of good management practice siting and operations.

3. Motivate and build capacity to adopt of codes of conduct and related good practices through training and organizing collaborations with researcher and businesses.

The program will help promote good practice adoption by creating industry working groups for recreational marinas and mariculture. These groups will comprise project staff and circles of

professionals interested in serving as trainers and extension agents. These groups will offer training programs in specific topics of interest to the mariculture and marina sectors. As well, these working groups will serve as the prototype for an extension network within the Gulf region.

Proposed Outcomes:

- A network of technical assistance providers receive training regarding environmental impacts of shrimp farming and GMPs to prevent or mitigate such impacts; level of knowledge is increased.
- Private sector managers and owners receive training with the result that they improve knowledge, demonstrate changes in attitude or change practice.

4. Provide operational guidance and communicate results broadly to accelerate awareness, interest and broader adoption of GMPS.

Cooperating shrimp farms and marinas are expected to use the operating guidelines provided by the project's working group to carry out practical demonstrations of the good practices. The results from all project stages will be compiled and broadly communicated to wider audiences, especially to advocates for continuing implementation and expanded utilization.

Proposed Outcomes:

- Number of shrimp farmers and marinas participating in voluntary adoption of GMPs, or having plans to do so, are increased.
- Information provided to private and public sector stakeholders helps to insure that operational efficiency is optimized, risk is reduced, other resources (i.e.water quality and wetlands) are not adversely affected and externalities are minimized.
- Regional networks of institutions are strengthened so common goals are achieved through cooperation.

Geographic Area of Focus

The main focal area for work in mariculture is centered on Bahía Santa María, Sinaloa, which already has a locally-prepared management plan and is within a state that is presently completing a coastal use designation program through an OET.

Much of the marina work (i.e. training and diagnosis) will be Gulf-wide, given that the *Escalera Nautica* project is one of regional concern. This will be complemented by site-based initiatives with support from CRC's complementary resources. Based upon requests from local groups in La Paz (Baja California Sur), and Altata (Sinaloa), CRC is already providing support to two marina sites – one already developed and one proposed. Support to decisionmaking in additional sites is likely for the ongoing Gulf-wide regional ordinance and/or in conjunction with specific harbors as identified in the project start-up phase[3].

[3] Several factors have been considered in identifying locations for training and sites for early applications. These include: proximity to areas of high bio-diversity, the potential for conducting negotiations that would lead to proposals that reach toward

Summary Table of Project Activity Location and Emphasis

	Emphasis on regional outreach	Geographic focus of site based work	Potential public policy implications
Tourism Marinas	Early emphasis will be on regional decisionmakers, industry organizations, and conservation groups in a position to ensure guidelines are absorbed into regulations/public policy	Sites to be identified in four states representing a range of situations (Complementary funds are supporting ongoing work in La Paz (Baja California Sur), and Altata (Sinaloa)	OETs in all four states, Gulf-wide Marina Environmental Plan, municipal tourism development plans
Shrimp mariculture	Primarily to firms within the Sinaloa expansion sites and institutions which provide extension services within the state such as Sinaloa Aquaculture Institute,(ISA) and the Research Center for Food Development (CIAD); training will include Sonora and Nayarit operators	Sites in Sinaloa: Bahía Santa María	State of Sinaloa OET, recommendations to Official Norms and/or Federal Zone (ZOFEMAT) policies, Gulf wide Marine Environmental Plan (OEM)

Program Phases and Activities

The project team will form industry working groups for both the marina and mariculture tasks. These groups will include lead staff and key industry, academic and public sector collaborators. These groups will be the primary focal point for coordinating and reviewing technical work as well as developing recommendations for guidelines, criteria and policy statements. The project team will be responsible for maintaining communication, organizing training and consultative events and preparing and distributing project publications and information through the Internet and printed materials.

RECREATIONAL MARINAS

1. Adopting an Industry Code of Conduct and Specifying Good Practices

There is an extensive body of international literature and good practice on marina and coastal tourism siting and operation, some of which has already been translated into Spanish and used in some Caribbean countries[4]. The activities and characteristics of most concern include:

- Marina design and siting
- Construction activities
- Public launching ramps

maximizing potential joint gains, expressions of local interest, demonstration of some technical capacity from public sector and civic associations, the possibility that agreements and actions demonstrated at the site level or with counterpart organizations will support the regional environmental ordinance (the OEM) or state level coastal environmental plans (OETs), and the likelihood that the proposed economic activities have high potential for success in the market.

[4] Guia Ambiental para Marinas y Astilleros de Yates. International Maritime Organization.

- Landscaping, plantings and buffers
- Fishing and fish cleaning on docks and piers
- Fuel facilities
- Sewage pump-outs and bathrooms
- Boat cleaning and painting
- Engine and hull repair
- Commercial boat operations such as fishing, ferry, tour boats

The US relies upon a mix of regulatory and voluntary programs. Much of the US experience in developing good management practices (GMPs) draws upon the efforts of private sector/government partnerships to address point source and non-point source pollution impacts. National guidelines have been developed in collaboration with the marina industry. These guidelines are based on the premise that GMPs can be economically beneficial as well as environmentally sound. This approach is highlighted in *Clean Water, Clear Value*,[5] a study that uses testimonials and analysis of individual facilities to showcase examples of voluntary compliance. The report also illustrates situations where improvements have been made due to strict local, state, or national regulations. Voluntary compliance is also proving its usefulness in the Caribbean, where a Code of Conduct is being adopted by marina owners and boaters.

Activities

Survey existing practices in recreational harbors and facilities

The project team and Marina Industry Working Group will complete the reconnaissance of marina sites and facilities begun in November 2001, and presented in the report which has served as a basis for the present proposal.[6] The visits to additional recreational harbors and facilities will extend our understanding of how Mexican marinas address environmental impacts through good practices and identify the major gaps in technical knowledge as well as attitudes towards environmental and social GMPs. The survey will identify the locations where additional regulatory tools and plans are being developed or might be needed. The project team will also identify where and how voluntary approaches could be used, as well as what additional information is required for making recommendations on siting decisions and adoption of good practices. Finally, the survey will help select the themes and areas where outreach and education is most needed and how it might be most productively provided. This overview will generate a much clearer sense of the regional context, enabling the project team to make better decisions on the selection of harbors, marina facilities, and policy-making efforts for follow-up.

We anticipate that the Packard Foundation will move forward with its plans to fund a market analysis of demand within the U.S. for recreational boating in the Gulf of California which will be available to guide the work proposed here.

[5] *Clean Water, Clear Value*. 1996. Neil Ross Consultants. Environmental and Business Success Stories. U.S. Environmental Protection Agency, Washington, D.C.

[6] *A Reconnaissance of Selected Sites and Recommendations for Sustainable Marina Development in the Gulf of California*. Neil Ross, P. Rubinoff, M. Amaral, M. Angeles Carvajal, D. Robadue, F. Zamora. January 2002. Coastal Resources Center, URI and Conservation International-Mexico.

A Marina Code of Conduct

The Marina Industry Working Group will work with the Mexican Marina Association (AMMT for the title in Spanish) to review the global literature and available information on good practices, and share the findings of its survey of sites and facilities as the basis for drafting a Code of Conduct that would be discussed by its members and considered for adoption and promotion. The product of this exercise will be used as the basis for selecting the good practices to be featured in training materials, events and operational guidance to designers and managers.

Specifying best practices to enable facilities to comply with the draft Code of Conduct

The Marina Industry Working Group will draw upon the draft Code of Conduct and the reconnaissance report to guide its selection of good practices to be defined and introduced in public planning and decisionmaking processes (Section 2) and industry training and outreach (Section 3). The Group will consult with the AMMT and local harbor groups to verify information and review drafts as appropriate.

The selected marina GMPs will be compiled and presented in several flexible formats that can be updated and supplemented, for example as fact sheets in a notebook format, a compact disc that can include supplementary English and Spanish language materials and some measure of interactive or linked guidance, and a web site which will be updated frequently during the project. These formats would be preferred to a bound publication. The descriptions of the selected and adapted good management practices will be geared towards the marina industry, decisionmakers, and local environmental groups. The fact sheets will draw upon the examples of good practice from relevant experience in Mexico, complemented by international experience.

2. Engaging in Ongoing Policy and Decisionmaking Processes on Marina Siting and Operations

The extent of marina industry involvement in regional planning and policy setting is surprisingly limited, yet some industry members have indicated that increased communication and exchange of management issues (such as concerns about over-fishing, waste management, and one-stop permitting) would be of great interest to its members.

A regional marine environmental plan for the Gulf of California is slated to be produced during 2002, followed by a series of regional coastal environmental plans which will define the specific policies, criteria, and densities of future development in states and municipalities. The Mexican government is also drafting official rules for marina siting and operation. Unfortunately, the marina industry is not fully engaged in these proceedings, which reduces the likelihood that the plans and criteria will have the desired influence on industry decisions. This project provides the opportunity to reverse this tendency and to improve the quality of the public policies shaping the course of industry development in the Gulf.

Activities

Industry participation in policy making

The project will work with SEMARNAT to determine the most effective mechanism for the Marina Industry Working Group to participate in the marine ordinance and other decisionmaking

procedures (such as a regional impact assessment of the Nautical Route project) in order to provide substantive input to agency staff, and the project proponent FONATUR and their consultants. The project team will provide recommendations on decisionmaking criteria for marina siting and development that can used in state level OET procedures to make basic siting decisions. The project team will also endeavor to model good communication behavior in making timely information available about its activities.

The Nautical Route

The Working Group will contribute information about the Code of Conduct and good practices to forums about the *Nautical Route* project. The Working Group may consider proposing the creation of a marina design and siting review panel for regional policy setting and/or case-by-case reviews. This might be composed of Mexican and international experts, to review and recommend low-impact high-benefit approaches to harbor development and operations. The panel could provide input to decisionmakers on new development proposals to help avoid and minimize impacts to biodiversity, and maximize socioeconomic benefits to the adjacent communities

Addressing siting issues in recreational harbors

The project team will develop a procedure for receiving requests for expert support to communities seeking to shape or respond to input (either formal or informal) during the siting of these facilities.

Industry communication

The Marina Industry Working Group will assist the marina industry in improving its internal communication and its ability to link and influence the larger development process, covering topics such as:

- How it can improve its interactions with government and communities
- How it can set up internal process to review and approve the GMPs
- Good practices for community involvement which allow marina developers to effectively obtain and address community input to marina siting and construction as well become partners in generating local benefits.

3. Motivating Support and Building Capacity

Once the good practices have been selected and described, work will be initiated with the AMMT to design and implement training events and identify other opportunities for training in venues around the world.

Two major training events are anticipated, with content selected to meet the special needs of two distinct groups: marina owner/managers and marina developers. Marina owners and managers will benefit from training on a range of topics including environmental management, enforcement, cash flow administration and regulatory standards. Marina and hotel developers would be most interested in understanding the marina market, good site selection, and engineering design practices for new projects.

Trainers will be drawn from local marina experts and external advisors. Training-of-trainers workshops will be held, possibly in conjunction with the mariculture element described below, to build skills, provide and test case studies, exercises and lectures for the participants.

4. Operational Guidance and Communicating the Results of Good Management Practice Experiences

Follow-up visits and operational guidance will be provided for selected marinas or harbors to assist in the application of GMPs within facilities or planned projects or to test out practices where it is not clear how they might be adapted to the Gulf of California region. Two priority areas have already been selected and are being provided initial operational guidance through work funded by USAID. Altata (adjacent to Bahía Santa María) is slated for a facility as part of the *Escalera Náutica* as well as other planned boating facilities for residents. La Paz Bay is another key location due to its current and projected marina activity, as well as its role as a gateway to key islands in the Gulf Islands Reserve. This initial experience is expected to provide a knowledge base to apply to new marinas and recreational harbors proposed in the Gulf of California within or outside of the Nautical Route Project. Additional locations will be selected for provision of operational guidance, taking into consideration the criteria identified in the section Geographic Area to be Served, as well as their suitability as venues for training courses and other project events.

Harbor-based demonstrations of good management will focus on working with inter-institutional groups to implement selected aspects of GMPs through planning, siting, implementation of local ordinance and voluntary compliance by industry. GMPs will be tested which address socioeconomic benefits to the community. In this manner, the expansion programs for the marina sector can begin to promote equity of use, by private sector and social sector, men and women, local and international developers.

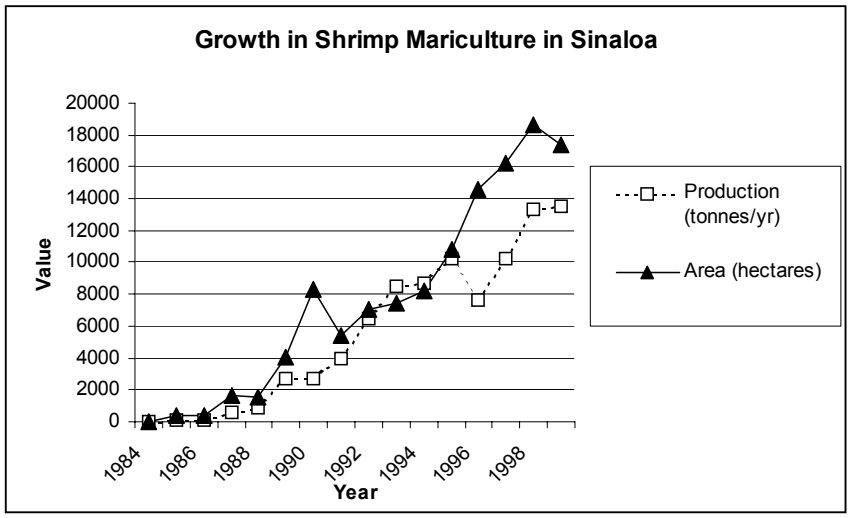
5. Summary of Outputs for Recreational Marinas:

- Operational Marina Industry Working Group
- Survey and diagnosis of existing environmental, siting, and socioeconomic practices in selected existing harbors
- A series of guidelines and fact sheets on GMPs
- WWW site for GMPs and outputs
- Two major workshops for marina industry and government decisionmakers
- Follow-up operational guidance to selected marinas in support of trials of GMP implementation and evaluation of the use of selected GMPs
- Recommendations for harbor management strategies, municipal ordinances and GMP guidance for selected locations and marina facilities
- Methods and initial results for documentation of economic and social impacts of good management practice approaches

SHRIMP MARICULTURE

1. Adopting an Industry Code of Conduct and Specifying Good Practices

The area of focus will be the estuaries in Sinaloa state, with a primary focus on Bahía Santa María. Sinaloa's industry accounts for over 50 percent of Mexico's production and approximately 70 percent of the shrimp farms. In 1999, Sinaloa had approximately 194 farms covering more than 17,376 hectares producing on average about 755 kg of shrimp per hectare per year[7]. A study in 2000, using somewhat different criteria, identified the number of shrimp farms in Sinaloa according to their location within coastal lagoons[8]:



Shrimp farms and their location, 2000

From the northern boundary of the state to Agiabampo, Sta. Maria, Topolobampo y Ohuira	25
San Ignacio-Navachiste-Macapule	52
Bahía Santa María	55
Ensenada Pabellón	56
Bahia de Ceuta	19
Estero de Urías	3
Huizache-Caimanero	6
Majahual coastal system	20
Total	**236**

[7] Arturo Ruiz Luna and Cesar A. Berlanga Robles. El Potencial de la Camaronicultura para Transformar el Paisaje en la Zona Costera. El Sur de Sinaloa como Caso de Estudio**.** *Laboratorio de Manejo Ambiental. CIAD-Mazatlán. in:* Camaronicultura y Medio Ambiente (Shrimp and the Environment), Editor Federico Páez Osuna, Unidad Académica Mazatlán, Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, Mazatlán, Sinaloa, México. 2001

[8] Lourdes P. Lyle Fritch, Emilio Romero Beltrán and Jesús A. Bect Valdez. *Desarrollo y Características de las Granjas Acuícolas en Sinaloa, México*. Centro Regional de Investigación Pesquera-Mazatán. In Osuna, ed., op. Cit.

Future maximum potential development of mariculture in the current (1999-2005) Sinaloa Development Plan was estimated to be as much as 180,000 hectares—nine times the current area.

The proposed project will draw upon previously successful work to create GMPs for shrimp farming in Central America[9], and will apply the process used to gain consensus and build capacity for implementing the practices in that region. One key result of the Central America program was the high degree of cooperation exhibited by the mariculture industry, including the provision of data enabling the analysis of the profitability of various forms of shrimp farm operation. Industry, governmental personnel and university staff were also enthusiastic cooperators in national advisory groups that helped guide the technical and social aspects of the project and this approach will be adopted here. The Central American GMPs, operations manual, training curriculum, and extension materials all provide an important source of information and experience in the area of GMPs[10]. Many of the technical advisors and extension experts involved in the Central America Project are expected to be available to work directly with Sinaloa colleagues. Thus, the starting point for GMP mariculture work in Mexico will already be fairly advanced in comparison to the status of the industry in Central America. Mexico also has the advantage of having a large number of well-trained mariculture professionals that recognize the need for GMP adoption as shown during the planning workshops.

GMPs for mariculture rely on the paradigm that practices which reduce risk of all kind are conducive to long-term sustainable production that provides maximum benefits to society. Therefore, GMPs focus on areas which are inherently risky and where good decisionmaking capability is required on a daily basis. GMPs also recognize that pond ecosystems are complex and dynamics are interconnected; thus, no single practice can be considered in isolation. Additionally, it is clear that pond ecosystems are linked to the host ecosystem and associated human communities.

The topics of GMPs will be focused on the most relevant issues regarding existing siting and operational practices in Sinaloa, such as:

- Site selection and other environmental aspects of farm design and construction
- Water quality management, closed and recirculating water systems and effluent control
- Basic farm operation: basics of farm operation, including sources of post-larvae, pond preparation, stocking density, feeds and feeds management, liming, disease control, chemical and biological agents, pond bottom and sediment management, and predator control
- Shrimp health management and pathogen biosecurity
- Financial administration, economics, risk-analysis and business management
- GMP self-assessment tools and techniques to increase the sustainability of the enterprise.
- Organization and management of shrimp aquaculture parks

[9] Boyd, Claude E., M. Haws, M., Green, B.W. *Improving Shrimp Mariculture in Latin America. Good Management Practices (GMPs) to Reduce Environmental Impacts and Improve Efficiency of Shrimp Aquaculture in Latin America and an Assessment of Practices in the Honduran Shrimp Industry*. 2001 (also available in Spanish)

[10] Haws, M. *Training Manual for Nicaragua-Honduras Course: Good Management Practices for Improving Environmental Performance of Shrimp Far*ming. 2001

A Mariculture Industry Working Group will be formed and responsible for review and adaption of the GMPs, with extensive support of the project team. Members will include representatives of industry organizations, land cooperatives known as *ejidos*[11] fishing cooperatives, the Conservation and Development Commission for Bahía Santa María (CCD) and key state institutions such as the University of Sinaloa, the Research Center for Food and Development (CIAD), and the Sinaloa Mariculture Institute. All of these are in a strong position to carry out and sustain an extension program as well as draw out the implications for state policy through the OET process for coastal Sinaloa, which is now underway.

Activities

Survey of existing practices and GMPs

Baseline information in Sinaloa will be taken from the Sinaloa field surveys performed in spring 2002, the mariculture profile of 2000[12] (funded by the David and Lucille Packard Foundation), and the most recent publication of shrimp mariculture activities in Mexico by the Autonomous University of Mexico.

These materials will be screened to select a priority set of practices that offer greatest relevance and feasibility in light of current circumstances in Sinaloa as the starting point for development and adoption of GMPs

The socioeconomic GMPs will also be drawn in part from previous studies of DeWalt[13] and the experience in southern Sonora, where an existing integrated program is built around the concept of the aquaculture industrial parks and participation of *ejidos* as associates in farm investments. The aquaculture park concept provides a common, lower-cost infrastructure, as well as management systems, which minimize environmental damage and maximize profitability for the local *ejido*. Lessons-learned identified from these examples, combined with other community-based socioeconomic practices (such as community forestry) can provide guidance on how best to promote and support effective programs for the *ejidos* related to mariculture.

A Mariculture Code of Conduct

The Mariculture Industry Working Group will work with the Sinaloa Aquaculture Institute (ISA) and shrimp farmers to review available information on good practices from Central America and other global literature. They will share the findings of its survey of facilities as the basis for drafting a Code of Conduct that would be discussed and considered for adoption by its members.

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[11] *Ejidos* were the form of organization established by the Mexican state to receive the land that was expropriated from large landowners and redistributed to peasants after the Revolution. *Ejidos* are agrarian communities composed of twenty or more individuals who organized to receive and manage the land. Although land rights were given communally to these communities, in most cases the arable land was subdivided and worked by individuals. Non-arable land, including substantial areas along the coast, continued as communal property and the resources there were open to exploitation by any member of the community." Source of quotation: DeWalt, B. 2000. *Social And Environmental Aspects Of Shrimp Aquaculture In Coastal Mexico*. Presented to MANGROVE 2000: Sustainable use of estuaries and mangroves: Challenges and prospects; Recife, Brazil 22-28, May 2000.

[12] Coastal Resources Center, et. al. 2001. *Promoting Best Management Practices for Integrated Mariculture Management in Sinaloa, Mexico*. A Collaborative Action Plan. Final Report to the Packard Foundation Mexico Conservation Program.

[13] Billie R. DeWalt, Center for Latin American Studies, University of Pittsburgh. *Shrimp Aquaculture, People and the Environment in Coastal Mexico*. L. Noriega, Centro de Investigación en Alimentación y Desarrollo, A.C., Sonora; J. Renán Ramírez Zavala, Universidad Autónoma de Sinaloa, Sinaloa; R. E. González, Universidad Autónoma de Nayarít. 2000.

The product of this exercise will be used as the basis for selecting the good practices to be featured in training materials, events and operational guidance to designers and managers.

Specifying best practices to enable shrimp farms to comply with the Code of Conduct

The Mariculture Industry Working Group will draw upon the draft Code of Conduct and the survey of mariculture practices (undertaken as part of the USAID project) to guide its selection of good practices to be defined and introduced in public planning and decisionmaking processes (Section 2) and industry training and outreach (Section 3). The Working Group will consult with ISA and shrimp farmers to verify information and review drafts as appropriate.

Information on existing practices and previous experiences with GMPs will be reviewed and assessed by the working group. The group will use this information to identify priority areas of practices (e.g. siting, feed management) and determine whether GMPs from other areas can be directly transferred or adapted for implementation in Mexico. The process will also be informed by consultation with Mexican and international specialists on shrimp culture who will be involved in the training of trainers. It should be recognized that development of GMPs is a reiterative process that will require periodic review and revision as the adoption process yields more information and a better idea of precisely how practices can be improved.

Dissemination of guidelines

As with the marina GMPs, the selected mariculture GMPs will be compiled and presented in several flexible formats that can be updated and expanded, for example as fact sheets in a notebook format, a compact disc that can include supplementary English and Spanish language materials and interactive guidance, and a web site which will be updated frequently during the project. The descriptions of the selected and adapted good management practices will be geared towards shrimp farmers, decisionmakers, and local environmental groups.

2. Engaging in Ongoing Policy and Decisionmaking Processes on Mariculture Siting and Operations

The Mariculture Industry Working Group will remain informed of and participate in planning and decisionmaking committees in Sinaloa, providing insights and recommendations related to decision making on future aquaculture development in a form useful to regional and local environmental plans. It will suggest criteria related to where new shrimp farms are located and how they will be required to operate. The Working Group may also be able to identify areas for restoration and thus could include recommendations for how to reduce the impacts of existing farms. Guidelines or policies incorporated into the regional plans or into the decision making criteria used by public officials to evaluate specific proposals, should be consistent with and reinforce the voluntary approach which is the main thrust of the work in this proposal.

Participate in local and regional environmental ordinances

The project will work with SEMARNAT, ISA and the Bahía Santa María CCD, to determine the most effective mechanism for the Mariculture Industry Working Group to participate in the marine ordinance for the Gulf of California, the coastal ordinance for the State of Sinaloa, and municipal environmental plans in Angostura and Navolato. In this way, the mariculture GMPs can help provide criteria for building and operating new shrimp farms within the Gulf, and

specifically in Sinaloa. As in the case of marinas, the project team will model good communication behavior in making timely information available about its activities.

Participate in Industry Forums

The project team and Working Group will contribute information about the Code of Conduct and good practices to forums about mariculture in the Gulf of California, as was the case during the Packard-funded planning grant which involved participation in a national meeting held in Culiacan.

3. Motivating Support and Building Capacity

An emphasis will be placed on building training and extension capacity through materials development, training methods, and curriculum preparation. We are proposing five major training events for shrimp farmers. Developing extension capacity within Mexican working group members will be a central feature of training-of-trainer events to be held before the main courses are offered, possibly carried out in conjunction with the Marina Industry Working Group as described above.

It is important to note that training will aim to not only improve the technical knowledge of GMPs, but also the ability of the training participants to transfer that technology. Thus, extension methodology will be a key part of the training agenda and participants and their institutions will be encouraged to actively work with industry through a series of facilitated interactions. The participants will also be guided to work with Mariculture Industry Working Group members, thus forming intra-institutional linkages that encourage an emphasis on outreach within institutions which are often research or bureaucratically oriented. It was found in the USDA Central America experience, for example, that this strategy of building links between the extension agent and key players within and outside of his or her institution was crucial in enabling the extension agent to be effective in technology transfer.

Once the guidelines are prepared, priority modules will be identified by the Mariculture Working Group, and up to 40 farm operators and staff will be invited to the series of five workshops planned over the two years. A few key representatives from Sonora and Nayarit will be invited to participate in the series in efforts to extend future efforts to those states. Training modules will take place at intervals of six to eight weeks. Participants will be expected to test or implement certain GMPs in their businesses and report on the results to their workshop peers.

GMPs typically are designed to provide economic benefits to the producer through optimization of production and lowering of risks, yet some may require funding to implement. In most cases, the cost/benefits of some of the GMPs with the most potential to yield environmental benefits are unknown. Preliminary work in this area for shrimp mariculture has been conducted by Dr. Carole Engle (University of Arkansas, Pine Bluff). Working with 10 years of data from the Honduran industry, Dr. Engle has developed a model that allows analysis of the cost/benefits of a select set of practices. This model is also useful in that it allows a producer to examine a large number of management scenarios *a priori* to estimate the expected financial and production results of changing a particular practice. Similar work has been conducted by Neil Ross and Dr. Tim Tyrrell, documented in works such as *Clean Marinas-Clear Value.* Data and case studies

will be developed as part of the site studies described in, as well as obtained through marina industry training workshops and site visits.

Introductory training in the application of these economic analysis approaches will be provided to help project teams and GMP adopters to document benefits from specific good practices, efficiencies to be gained, and costs which can be avoided with good siting and operations.

4. Operational Guidance and Communicating the Results of Good Management Practice Experiences

Follow-up visits and operational guidance will be provided for selected shrimp farms and within Bahía Santa María to assist in the application of GMPs within facilities or planned projects or to test out GMPs where it is not clear how they might be adapted to the bay or the other estuaries along the Sinaloa coast. As training proceeds, the in-country training assistants will work at the farmer level and in conjunction with the industry associations to disseminate the operational guidance.

Although the primary effort will be focused in northern Sinaloa, the project will also reach out to the industry in Sonora and Nayarit by offering opportunities for their participation in the working group, and providing GMP information developed, as well as identifying opportunities for joint capacity building.

Organizational development of producer groups

The Conservation and Development Plan for Bahía Santa María anticipates a three-fold increase in requests to build shrimp farms around the bay (from 5,000 hectares to 15,000 by 2020). For the longer term (and beyond the scope of this proposal) it would be highly desirable to define a build-out strategy in full recognition of ecological and hydrological constraints. The Strategy should also assure a sustained flow of economic and social benefits to those who presently control the bulk of the land where ponds might be constructed with relatively lower impacts. One of the concepts advanced as a result of the planning grant implemented by the CRC-CI team in 2000-2001, is the formation of special arrangements to insure proper development of the best unused sites, and the potential relocation of facilities in vulnerable areas to these new locations. It is expected that some of the farmers participating in the training program will originate from *ejidos.*

Effort will be focused on identifying the factors for successful social organization and business management for cooperatives and *ejidos* engaged in shrimp mariculture. The ability of cooperatives and *ejidos* to function as small businesses is a critical issue identified by the issue identification conducted by CRC. Presently, decisionmaking on pond siting and operation is often disassociated from technical competency within the organizational structure of these entities. GMPs cannot be effectively implemented unless:

- Technically skilled personnel are empowered to be agents of change within an organization
- Both management and labor are trained in basic business management skills
- The expected outcome of the organization is to produce profits and re-invest to build a long-term functioning business entity

Previous experiences with aquaculture cooperatives in Sonora demonstrates that success can be achieved through long-term training and technical support; organizational restructuring to improve management, decisionmaking and business planning to achieve long-term profitability and reinvestment.

This activity would involve providing support to one or two cooperatives or *ejidos* in a pilot effort to support development of appropriate institutional organizational structure and management capability. Support will be provided by the Mariculture Industry Working Group, consisting of an economist, cooperative business specialist, finance specialist, and management and technical personnel from the participating cooperative or *ejido*. Experiences and results will be closely monitored and documented so that other groups may benefit.

5. Summary of Outputs for Shrimp Mariculture:

- Diagnosis of existing practices in Sinaloa's targeted coastal ecosystems, primarily in Bahía Santa María
- Series of updated bulletins on GMPs in a variety of formats
- WWW site for GMPs and outputs
- Recommended policies and decisionmaking criteria for siting and operation of shrimp farms in Sinaloa
- Training-of-Trainers workshop and materials
- Training plan, materials and implementation of a series of five workshops for mariculture industry and government decisionmakers
- Operational guidance and follow-up extension visits by staff to sites of training participants
- Siting, design and management recommendations for an environmentally and socially sustainable *ejido* shrimp mariculture park

Phasing of Program Activities

Year One

Start up activities

- Agreements with key collaborators
- Hire staff and equip local office
- Create mariculture and marina working groups
- Prepare detailed workplan and review with working groups
- Specification of progress monitoring and indicators

Marinas

- Survey and diagnosis of existing environmental, siting, and socioeconomic practices in the remainder of existing marina harbors not included in project design survey
- Code of Conduct drafting exercise
- Develop series of fact sheets on marina good management practices
- One major workshop for marina industry and government decisionmakers

- Site visits to marinas for GMP operational guidance, and implementation and evaluation of the use of selected GMPs in selected marinas
- Recommendations for area-wide environmental plans and ordinances
- Guidance documents on GMPs and recommendations for marinas in selected harbor sites

Mariculture

- Survey and diagnosis of existing practices in Sinaloa's targeted coastal ecosystems, primarily in Bahía Santa María
- Code of Conduct drafting exercise
- Series of updated fact sheets on selected mariculture GMPs
- Recommended policies and decisionmaking criteria for siting and operation of shrimp farms in Sinaloa
- Training materials and training plans
- Training-of-trainers event
- Implementation of two workshops for mariculture industry and government decisionmakers

Year Two

Marinas

- One major workshop for marina industry and government decisionmakers
- Develop recommendations for local environmental plans and ordinances
- Follow-up activities, including operational guidance in selected marinas and harbors, and additional site visits to marinas for GMP implementation and evaluation of use
- GMP guidance document and recommendations for a recreational harbor

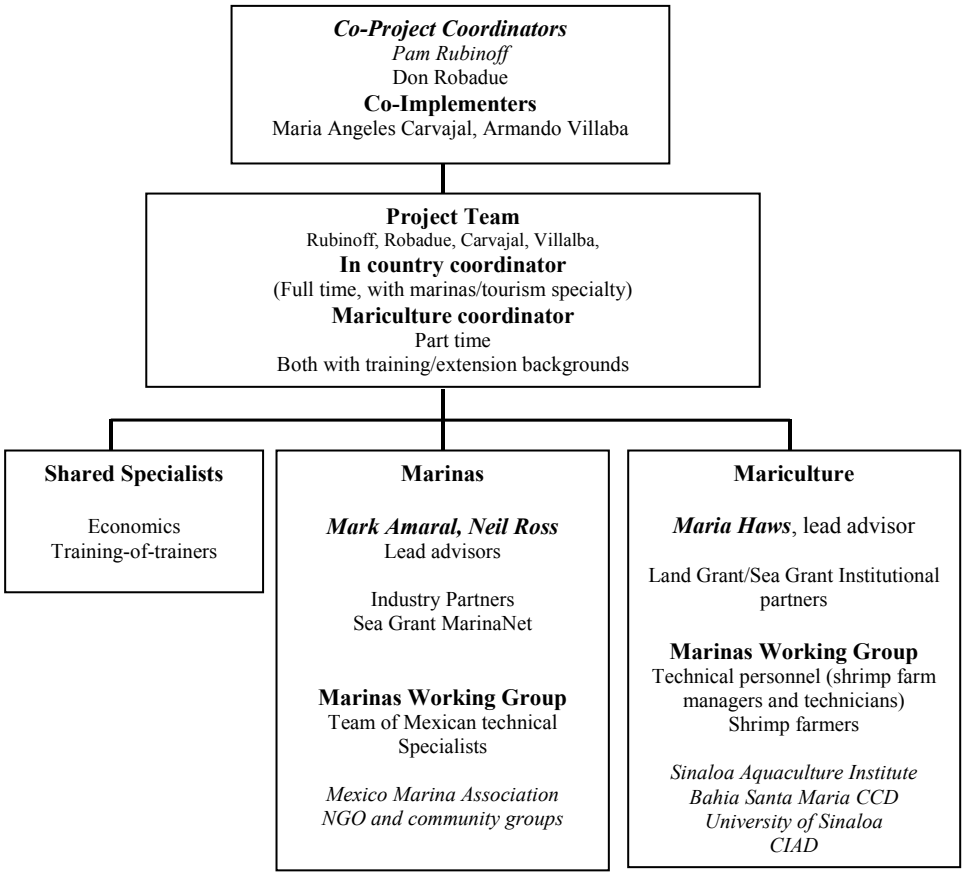
Mariculture

- Implementation of a series of 3 workshops for industry and government decisionmakers
- Follow-up operational guidance and extension visits by staff to sites of training participants
- Team activities to support siting, design and management recommendations for environmentally and socially sustainable *ejido* shrimp mariculture park
- Synthesize recommended policies and decisionmaking criteria for siting and operation of shrimp farms in Sinaloa

Project Reporting and Documentation

The project will provide semi-annual reports to the Packard Foundation, reporting on advances and outcomes. A complete documentation will be provided to the Foundation at the close of project. Key products will be made available on a regular basis through the project www site and sent to key resource users and project proponents. It is anticipated that as the project comes to a close, the team will develop proposals for 1) post-project continued demonstrations and technical assistance in sites and locations and 2) extending the support and extension network in the Gulf of California.

Program Implementation Structure



The Project Team

The CRC team will be under the overall supervision of Pamela Rubinoff, Mexico Program Leader. Ms. Rubinoff is a coastal manager with over 10 years of direct experience in implementing state and federal coastal programs in New England, in addition to six years of technical assistance and program leadership in CRC's Latin America program. Ms. Rubinoff will provide overall project guidance and supervision, and will be responsible for direct coordination and communications with Packard Foundation. CRC's core team will include Donald Robadue, a CRC associate coastal resources manager, who has worked in Latin America since 1985. He will bring 26 years of expertise as a coastal planner to program activities such as policy analysis, strategy development, estuary management, and design/implementation of training activities. Emilio Ochoa, Executive Director of Ecocostas (Ecuador), will join the CRC team to contribute extensive experience in training, extension, program assessment, and social sector collaboration in Latin America.

CRC's program leadership will collaborate directly with CIMEX, led by Maria Angeles Carvajal. As director of the CIMEX's Gulf of California Program, Ms. Carvajal has extensive

experience in implementing regional programs in the Gulf of California directed at biodiversity and conservation. At the site level, the project will be co-implemented with Armando Villalba, currently the director of wetlands conservation for CIMEX. Over the past three years, Mr Villalba has lead the intersectoral team of Bahía Santa María to develop and implement a community- based management program for the sustainable development of a coastal lagoon in Sinaloa. This builds upon his extensive, 15-year experience in shrimp aquaculture production and shrimp farm design along the Pacific coast of Mexico.

The project team will consist of a core group of individuals within a CRC consortium. Their responsibilities and expertise are described below. Within Mexico, CIMEX will be the primary co-implementers. The CRC-CIMEX team will hire local staff, in addition to partnering with local universities and NGOs for both marina and mariculture activities.

The mariculture team will be lead by Dr. Maria Haws, Associate Director of Pacific Aquaculture and Coastal Resources Center/University of Hawaii at Hilo (UHH), and Director of the Pearl Research and Training Program). Ms. Haws worked with the CRC/URI from 1997 to 2001 and recently led the Central American GMP efforts supported by USAID and USDA. She will co-lead the survey of existing practices, assist in coordinating the review and development of GMPs for Mexico and act as lead training coordinator. She will work with several institutions, outlined below, to implement the proposed technical assistance and training activities. She will also play a role in the design and operation of the GMP extension program for the shrimp industry. Dr. Haws is fluent in Spanish and has 19 years of work experience in Latin America.

The Marina team will be lead by Mark Amaral. Mr. Amaral has more than a decade of experience in US and international coastal management initiatives. His related experience includes creating and managing the Sea Grant MarinaNet professional network and writing Rhode Island's pollution reduction program for marinas. This pollution reduction program was one of the first "clean marina" programs in the United States. Mr. Amaral is currently the President and Co-CEO of Lighthouse Consulting Group. Lighthouse provides a range of services to those who promote the wise use of coastal resources including (a) education and training; (b) design, management and administration of networks; and, (c) applied research, policy development and planning. Current clients include the Marina Operators Association of America, International Marina Institute and the Marine Environmental Education Foundation.

Institutional Partners

Marinas

The CRC marina team will link with other key U.S. industry representatives to collaborate with Mexican marina partners. Neil Ross, one of the project's senior advisors, has worked on marina issues for over 25 years, first through the URI Sea Grant Extension Program, and then as an independent consultant. Mr. Ross was a key author in the recent national guidelines on marina good management practices published by the U.S. Environmental Protection Agency. Other colleagues will be drawn from the International Marina Institute and the Sea Grant MarinaNet network (such as Louisiana State University and Texas A&M) who have been active in marina issues in the US and Caribbean. The key Mexican partners for marina work will be the industry itself, government agencies, and the non-government organizations of the region. The Mexico

Marina Trade Association has 30 members and is based in Guaymas, Sonora. Local project associates will include members from the NGO alliance, ALCOSTA, as a means to build capacity for promoting GMPs through local environmental groups and communities.

Mariculture

Seven major Land Grant and Sea Grant Institutions (URI, UHH, Texas A&M University, Auburn University, University of Arizona, University of Florida, and University of Arkansas/Pine Bluff) will partner to develop and implement training programs in Sinaloa. The partnership will be tightly linked to Sinaloa's Aquaculture Institute, whose programs and board of directors represents industry associations, major educational institutions, and government agencies. In addition to onsite CRC and CIMEX staff, individuals and academic institutions (University of Sinaloa, *Centro de Investigación, Alementación y Desarrollo*) will be contracted directly by the program to build BMP and extension capabilities for future advancement. The precise roles and modalities of participation of each of these entities is currently under discussion and will be finalized during project start-up. In addition to the technical skills of this partnership, the team has important links to other programs working in mariculture, such as the Inter-American Development Bank; The World Bank; US Department of Agriculture, Food and Agriculture Organization; Global Aquaculture Alliance; and World Wildlife Fund.

Texas A&M University/Sea Grant Program - Dr. Granvil Treece will oversee a team of shrimp culture and extension specialists from the Texas A&M University systems and Texas A&M Sea Grant/Land Grant program. These specialists also include: Dr. Joe Fox (Nutrition and Feed Management); Dr. Tzachi Samocha (Pond Management/Effluent Treatment); and Dr. Ron Rosati (Design and Construction of Ponds). Dr. Treece will provide expertise in extension methodology. All team members have Spanish language capacity and extensive experience in Latin America.

University of Arkansas/Pine Bluff - Dr. Carole Engle, an aquaculture economist, has led research to improve shrimp farm optimization with an emphasis on the economic aspects of GMPs. She is fluent in Spanish and has extensive experience in Latin America.

University of Auburn - Dr. Claude Boyd is widely recognized as the foremost authority on water and soil quality management in shrimp ponds. He has assisted a number of industry and environmental groups develop GMPs (e.g. WWF, Industrial Shrimp Action Network, and GAA), and regularly works to facilitate agreements between stakeholder groups in this area. Dr. Boyd provided technical assistance during the Packard Foundation support planning initiative. He speaks Spanish and has worked in Latin America for over 25 years.

University of Arizona - Drs. Carlos Pantoja and Donald Lightner have provided extensive assistance to the global shrimp industry in bio-security, diagnosis of disease and reduction of risk and are recognized as leading authorities in the Americas on these topics. They provided technical assistance during the Packard Foundation support planning initiative. Dr. Pantoja is a native of Mexico and Dr. Lightner has extensive experience with the Latin American shrimp industry.

Financial Proposal

	REQUEST YEAR 1 Year 1	Subtotal	REQUEST YEAR 2 Year 2	Subtotal	URI Complementary[2] Year 1	Subtotal	PROJECT TOTAL
PERSONNEL (salary, benefits)							
Subtotal Personnel		**$72,737**		**$92,780**		**$20,043**	
							$185,560 SUBTOTAL PERSONNEL
OPERATING EXPENSES[1]							
Subtotal Operating		**$10,600**		**$11,200**		**$8,000**	
							$29,800 SUBTOTAL OPERATING
RECREATIONAL MARINA ACTIVITIES							
Code of Conduct and GMP		**$72,600**		**$4,000**		**$4,000**	
Policy and Decision-making		**$5,000**		**$10,000**		**$2,000**	
Building Capacity				**$13,900**		**$15,400**	
Operational Guidance				**$5,000**		**$20,000**	
							$151,900 SUBTOTAL MARINAS
MARICULTURE BEST PRACTICES							
Code of Conduct and GMP		**$28,750**		**$4,000**			
Policy and Decision-making		**$1,200**		**$1,200**			
Building Capacity		**$26,000**		**$42,000**		**$16,500**	
Operational Guidance				**$12,000**		**$9,600**	
							$141,250 SUBTOTAL MARICULTURE
SUBTOTAL		**$216,887**		**$196,080**		**$95,543**	**$508,510** PROJECT TOTAL

Budget Summary

Request to Packard Foundation	***$412,967***
Year 1	*$216,887*
Year 2	*$196,080*
CRC-URI Programmatic Support [2]	***$95,543***
TOTAL PROJECT COST	***$508,510***

Institutional Support

URI Waived Overhead [1]	***$134,627***
Other Institutional Support [3]	***$25,000***
TOTAL	***$159,627***

Budgetary Notes:

1. ***The URI overhead of 32.6% has been waived for Foundation Grants to CRC***
2. ***The CRC-URI complementary funds have been committed by USAID, through the Conservation of Critical Coastal Management Program, through September 2003.***
3. ***Other institutional support from partners UHH, Texas A&M, and Mexican institions will provide additional access to staff time and resources to compliment these activities***

	REQUEST YEAR 1 Year 1	Subtotal	REQUEST YEAR 2 Year 2	Subtotal	URI Complementary[2] Year 1	Subtotal	PROJECT TOTAL
PERSONNEL (salary, benefits)							
CRC Personnel (incl benefits)							
Rubinoff	$14,050		$21,075		$7,025		
Robadue	$8,687		$17,373		$8,687		
Harrington (CRC fiscal support)			$4,331		$4,331		
In-country staff							
Project Coordinator/marina extension	$35,000		$35,000				
Mariculture extension	$15,000		$15,000				
Subtotal Personnel		**$72,737**		**$92,780**		**$20,043**	
							$185,560 SUBTOTAL PERSONNEL
OPERATING EXPENSES[1]							
Mexico Office	$6,600		$4,800		$4,500		
RI Office			$2,400		3,500		
Subtotal Operating		**$10,600**		**$11,200**		**$8,000**	
							$29,800 SUBTOTAL OPERATING

	REQUEST YEAR 1		REQUEST YEAR 2		URI Complementary[2]		PROJECT
	Year 1	Subtotal	Year 2	Subtotal	Year 1	Subtotal	TOTAL
RECREATIONAL MARINA ACTIVITIES							
Code of Conduct and GMP		**$72,600**		**$4,000**		**$4,000**	
External technical assistance	$35,000						
International travel and perdiem	$12,000				$4,000		
Regional travel and perdiem (local staff	$1,600						
Worksessions	$14,000						
Local Expertise	$8,000						
Fact sheets	$2,000		$4,000				
Policy and Decision-making		**$5,000**		**$10,000**		**$2,000**	
Local travel/perdiem	$1,000		$2,000		$2,000		
Local expertise	$4,000		$8,000				
Building Capacity				**$12,400**		**$12,400**	
Workshops			$1,900		$1,900		
Trainers			$8,000		$8,000		
International travel/perdiem			$2,500		$2,500		
Operational Guidance and Outreach				**$6,500**		**$23,000**	
Site planning and field testing of GMPs			$5,000		$20,000		
www design and maintenance			$1,500		$3,000		
							$151,900 SUBTOTAL MARINAS

	REQUEST YEAR 1		REQUEST YEAR 2		URI Complementary[2]		PROJECT
	Year 1	Subtotal	Year 2	Subtotal	Year 1	Subtotal	TOTAL
MARICULTURE BEST PRACTICES							
Code of Conduct and GMP		**$28,750**		**$4,000**			
External technical assistance	$9,750						
International travel and perdiem	$8,000						
Worksessions	$3,000						
Local expertise	$6,000						
Fact Sheets/publication	$2,000		$4,000				
Policy and Decision-making		**$1,200**		**$1,200**			
Local travel/perdiem	$1,200		$1,200				
Building Capacity		**$26,000**		**$42,000**		**$16,500**	
Workshops	$2,500		$7,500		$2,500		
External technical assistance	$8,000		$24,000		$8,000		
International travel and perdiem	$3,000		$4,500		$3,000		
Local expertise	$3,000		$4,500		$3,000		
Local travel/perdiem for extension	$3,000						
www design and maintenance	$1,500		$1,500				
Posters	$5,000						
Operational Guidance				**$12,000**		**$9,600**	
External Technical assistance					$4,000		
International travel and perdiem					$3,600		
GIS work/modeling					$2,000		
Field testing GMPs			$5,000		$0		
Economic MODEL			$7,000				
							$141,250 SUBTOTAL MARICULTURE

Addenda

Attachment 1	Prior Foundation Grant Proposals Grants to the CRC from other Foundations for 2001/2002 Grants to the CRC from the David and Lucille Packard Foundation 2001/2002
Attachment 2	CRC Illustrative Budget October 1, 2001 to September 30, 2002
Attachment 3	URI Foundation Fiscal Agent Letter
Attachment 4	IRS Exemption Letter
Attachment 5	Financial Statement URI Foundation Financial Statements URI Foundation Budget Report - FY2002
Attachment 6	Trustees of the URI Foundation