

## When Fishing Grounds Are Closed: Developing Alternative Livelihoods for Fishing Communities

Closure of customary fishing grounds, whether for fisheries management or as part of an MPA, can strain coastal communities. Fishers, processors, and other workers dependent on fisheries for income may find few options for other employment, particularly in remote, rural areas. When prospects for alternative employment are limited, fishing-dependent communities can suffer economic hardships, including unemployment and outward migration. In areas with little or no enforcement, fishers may be tempted to resume fishing within the closures.

It may be in the interest of governments and MPA proponents to help ensure there are alternative livelihoods available for displaced fishers. But developing viable employment options is more easily said than done. To illustrate some of the factors and potential strategies involved, MPA News this month examines three alternative livelihood programs for fishers, each with different circumstances and challenges.

### **Atlantic Canada: Massive adjustment to cod closures**

The cod fishery off the Atlantic coast of Canada, once the emblem of the maritime culture in Canada's eastern provinces, is a shadow of its former self. Overfishing and other factors depleted cod stocks to the point of collapse in the early 1990s. Despite stringent conservation measures adopted since then, cod populations remain close to the lowest ever recorded in Atlantic Canada.

As stocks have declined, so have prospects for cod fishermen. The Canadian government placed a moratorium on cod fishing in 1992, throwing 40,000 fishermen and fish plant workers in Atlantic Canada out of work. Although the fishery was partially re-opened in the mid-1990s, this April the government re-closed three of the four open stocks indefinitely. Compared to the height of cod fishing decades ago when 800,000 metric tons/year were harvested, this year's quota for the remaining open stock — off the south coast of Newfoundland — is 15,000 metric tons.

In announcing the most-recent cod closures, which are expected to impact about 3000 fishers and plant

workers, the Canadian government allotted CDN\$44 million (US\$31 million) in community-based economic development assistance, targeted to provide short-term employment for affected workers and ensure they can qualify for unemployment benefits over the next two years. This is the latest installment in what has been a CDN\$4-billion (US\$2.8-billion) effort overall by the federal government since 1992 to help fishers and plant workers adjust to cod closures. This massive effort has featured an array of initiatives including license buyouts, income support, skills training, relocation, and assistance programs for economic diversification.

While this has occurred, the federal government has also overseen a major expansion of existing crab and shrimp fisheries in the region, fueled primarily by a boom in these stocks' resource base and improved market conditions in the US and Japan, particularly for crab. Because of this, the government has been able to alleviate some, though not all, of the pain associated with the cod closures by allowing additional access to these alternative resources. Despite the shellfish boom, the total of registered fishers in Newfoundland and Labrador, the province hardest hit by the cod collapse, still dropped 44% from 1991-2002.

Impacts of the above initiatives are evident. Tourism — a major focus of government development assistance — is making a growing contribution to the Newfoundland and Labrador economy, attributable to a mix of product development, training, and advertising campaigns highlighting the cultural, historical, and environmental features of the province. From 1992 to 2002, the number of visitors to the province increased 40%, and related expenditures more than doubled to CDN\$300 million (US\$210 million) annually. Meanwhile, shellfish has become the foundation of the Newfoundland and Labrador fishery, accounting for 82% of the total landed value. Crab catches were four times higher in 2001 than 1990, and shrimp catches were three times higher.

Doug Burgess is the Newfoundland and Labrador director of public affairs with the Atlantic Canada Opportunities Agency (ACOA), the federal agency

*continued on next page*

### **Table of Contents**

When Fishing Grounds Are Closed: Developing Alternative Livelihoods for Fishing Communities ... 1

Letter to the Editor ..... 4

*MPA Perspective*  
International Advisory Boards: A Tool for Local MPA Management ..... 5

Notes & News ..... 6

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MPA News is published monthly by  
Marine Affairs Research and  
Education (MARE), a 501(c)(3) not-  
for-profit corporation, in associa-  
tion with the School of Marine  
Affairs, Univ. of Washington.

All content has been written by the  
MPA News editorial staff unless  
otherwise attributed.

Financial support for MPA News is  
provided in part by grants from:

- David and Lucile Packard  
Foundation;
- Office of Ocean and Coastal  
Resource Management, National  
Oceanic and Atmospheric  
Administration (NOAA), Silver  
Spring, MD (USA), under the Federal  
Coastal Zone Management Act;
- Washington Sea Grant Program,  
Univ. of Washington, pursuant to  
NOAA Award No. NA16RG1044; and
- National Fish and Wildlife  
Foundation (NFWF).

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responsible for providing economic development assistance to Atlantic Canada. He says the growth in tourism is at least as much because of local initiative as government funding. "To say that the changes have come about because the government threw a lot of money at the problem would be unfair," he says. "The people who have chosen to remain here [in Newfoundland and Labrador] have shown the initiative to come up with successful projects." ACOA field staff and account managers work with community organizations to identify opportunities for the creation of alternative employment and to develop sustainable local economies.

The shifts in the provincial economy have not been seamless, says Burgess. There has been a net outward migration of 40,000 people from Newfoundland and Labrador since the 1992 moratorium. While there are success stories, certain areas of the province have lost up to 30% of their population, and unemployment remains high in many fishing-dependent areas, he says.

There are also signs that the crab fishery, which once welcomed cod fishermen, is reaching its limit: the crab quota in some parts of Labrador this year was cut by 40% compared to last year. (Shrimp harvests remain strong: the Canadian Department of Fisheries and Oceans increased the Atlantic Canada shrimp quota this year by 29% to 152,000 metric tons, and allocated some of the quota increase for the direct benefit of those affected by reductions in cod and crab.)

Burgess says that dealing with this decade of cod closures — what he terms the largest industrial adjustment in Canada's history — has provided lessons to ACOA, particularly in terms of interacting with community organizations. "Governments need to be patient when dealing with community volunteer groups," he says. "You're dealing with a dramatic transition out of a well-established industry with a particular set of skills into other industries or projects, often requiring whole new skill sets." Burgess says that by organizing programs involving multiple communities, rather than addressing each community individually, development agencies can take advantage of opportunities for collective strength. He cites one peninsula particularly hard hit by the cod closures where several communities have teamed successfully to organize and promote a historic heritage trail and related tourist attractions.

A fundamental part of ACOA's work has been to foster a culture of entrepreneurship in Newfoundland and Labrador, which Burgess says is not a traditional part of the provincial psyche. "Fishing and fishing-plant work had been so labor-intensive, there was always an opportunity to find an existing job close to home," he says.

### Komodo National Park: Transforming the live reef fish trade

In Indonesia, more than 20,000 people live in communities in and around the coral-laden Komodo National

Park (KNP). Largely dependent on marine resources for their food and income, these residents will be affected by the planned implementation of no-fishing zones in the 1817-km<sup>2</sup> park. Although impacts of the new zoning plan will be mediated by use zones and exclusive use rights, those local fishers who depend on reefs inside the park will experience losses, particularly over the short term. Fishers who engage in illegal fishing practices — such as the use of explosives to kill fish (blast fishing) and the use of cyanide to stun and capture fish for the lucrative live reef fish trade based in Hong Kong — have been curbed in recent years by an effective enforcement and awareness program, although these practices remain a threat and could increase again if enforcement were reduced.

To lower dependency on reef fishing among the surrounding communities, the park is working to identify and promote alternative livelihoods in conjunction with The Nature Conservancy (TNC), a US-based NGO. To draw fishers away from the reefs, KNP and TNC have developed a pelagic fishery in the relatively unfished deep waters of the park, deploying six fish-aggregating devices (wooden rafts anchored to the seafloor) to attract skipjacks and yellowfin tuna. They have also worked to foster a local seaweed farming industry. Of the livelihood projects pursued so far, however, the most capital-intensive has been the development of a fish-culture system. In addition to providing local residents with an alternative livelihood, a goal of the mariculture project is to help transform the live reef fish trade — a scourge of Southeast Asian reefs in general — from its unsustainable and capture-based structure to one that is sustainable and culture-based, thereby protecting wild populations.

The mariculture project is still under development, but here is how it will work. The project is based on a "full-cycle" culture: captive broodstocks of grouper and snapper will spawn in a hatchery and the fertilized eggs will be collected. Larvae will be reared and, when they reach fingerling size, be transferred to village-run sea cages to grow out. Once they are of marketable size, the fish will be returned to the hatchery to be marketed to Hong Kong. A percentage of the revenue from fish sales will go to the villages and the remainder will be reinvested in the project to fund continued operation of the hatchery. Villages will be given the opportunity to operate the grow-out units as independent businesses after paying back the project for capital investments (i.e., the grow-out cages).

The hatchery has already been built, and a first small batch of fingerlings has been produced. According to Trevor Meyer and Sudaryanto, TNC field staffers who are developing the mariculture project, significant quantities of fingerlings may be transferred to experimental grow-out units in September. They estimate that once the fish-culture industry is established and the

existing hatchery upscaled as planned, the project and its associated grow-out units will employ more than 200 local people. If replicated at other sites along Indonesia's 95,000-km coastline, the concepts developed in Komodo would provide livelihoods to many more people and greatly increase the contribution of cultured fish to the Hong Kong market.

"It should be understood that this alternative livelihood project does not exclusively target fishers involved in the live reef fish trade," says Peter Mous, a TNC scientist who helped start the project. Although villages with high rates of destructive fishing practices will be among those selected first to participate in the project, any fisher in the Komodo area who is willing to commit to fish culture will be welcome to participate. "It is unlikely that the revenue of fish culture workers will be equal to or higher than the money that is made by cyanide or blast fishers who work pristine reefs — this would be like expecting drug traffickers to stop their practice by offering them a job at a supermarket," says Mous. "Rather, the project hopes to offer a sustainable livelihood that compares favorably to other occupations in the area, including fishing by legal means."

The project has faced challenges. The main one so far has been to optimize juvenile fish production in the hatchery. Compared to other fish species, there are relatively few clearly defined production techniques for grouper and snapper aquaculture, says Sudaryanto, and survival rates of grouper and snapper juveniles can be extremely variable. To address this, the project has hired experienced aquaculture personnel and maintained a number of strategic partnerships with relevant research centers that have expertise in the field of grouper culture.

One concern faced by nearly all fish aquaculture initiatives is the threat of disease transmission in captive populations. "The main precaution against stress and disease is to keep the densities low," says Sudaryanto. "We will develop a set of best practices and standard operating procedures to that effect." Another concern: the potential for the grow-out units to be misappropriated for raising wild-caught fish, although Mous suggests this will not be a major problem. "It is expected that the hatchery will become a much more constant source of fingerlings in terms of quantity and quality, so it is unlikely that grow-out of captured juveniles will become much of an issue," he says.

It is not guaranteed that even the employees of the grow-out units will refrain from engaging in destructive fishing practices in their free time, away from the project. "As far as illegal fishing in the park is concerned, we do not rely exclusively on alternative livelihood projects to address this problem," says Mous. "Our alternative livelihood projects are part of a more comprehensive program that includes modules on park

planning and financing, outreach, and surveillance. We think that all of these modules together achieve conservation success, whereas none of these modules would achieve much if implemented in isolation."

### **CORDIO, Indian Ocean: Producing for local market**

Alternative livelihoods for fishers may become necessary when fisheries are degraded and no longer productive, whether or not formal closures are instituted.

CORDIO, an international program created to address coral reef degradation in the Indian Ocean, is working to mitigate the impacts of coral bleaching through, among other efforts, the development of alternative livelihoods for coral-dependent communities. These alternatives, designed to reduce pressure on reefs, also aim to help human communities avoid economic dislocation in the event of mass coral bleaching. The program is funded by Sida (Swedish International Cooperative Development Agency), the World Bank, IUCN, WWF, and the governments of Finland and the Netherlands.

Olof Lindén, a biologist at the University of Kalmar (Sweden), serves as a coordinator of the program. "We are dealing in reality with coastal communities and their struggle to survive on what is produced locally," says Lindén. "We have been involved, for example, in developing alternative livelihoods for communities on the Tuticorn coast, India. There, families cannot survive any longer on fishing alone, so activities under CORDIO have helped to develop aquaculture, post-harvest processing (to increase the value of fisheries products), and various composting activities for the production of fertile soils for agriculture."

Because of the breadth of the program's focus — the entire Indian Ocean — the feasibility of potential livelihoods may differ widely among communities within the program area. CORDIO is developing aquaculture for aquarium fish in Sri Lanka, and for crab, fish, and prawn in East African mangrove areas. Seaweed farming has also been successful as an alternative livelihood in East Africa, but has been a bust in South Asia, where growing conditions are different and there is no traditional market for the product.

David Obura, director of CORDIO's East African operations, says the main challenge facing the program is to establish a context for developing livelihoods that reflects the culture and resources of the target community. "CORDIO has worked with an education and training center called KWETU in Mombasa [Kenya] where we have tried to motivate local fishers to develop mangrove crab culture in pens in the mangroves, rather than relying on wild-caught crab," says Obura. "To match their resources, we have intentionally not used high-protein feed such as fish and meat that needs to be

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transported from local butcheries, commercial fish markets, etc. Instead, we have tried to rely on local trash food.”


Unfortunately, the local food source for the crabs has not been in high enough supply or of sufficient protein richness to stimulate the rapid growth rates that cultured crabs can attain, says Obura. “Another setback has been that the fishermen with whom we work, while well-skilled at catching and maintaining crabs and observing how they are growing, are not experimentally minded enough and do not adapt quickly to problems,” he says. “They will observe crabs fighting and breaking each other’s claws off without visualizing solutions such as isolating the crabs somehow or binding their claws.”

This highlights the importance of interaction between researchers/technicians and local resource users for identifying real alternatives. “The challenge is to find the right specialist, who may need more skills in public relations and adaptive management than in specialist science,” says Obura. Relating to resource users is key, particularly in situations where there may be community suspicion of the intentions and motivations of an “outsider” program like CORDIO. “The local political dimension is perhaps the biggest wild card in our work,” he says.

For many communities near coral reefs, dive and snorkel tourism is an option as a livelihood. Lindén

says CORDIO encourages communities to get involved in the tourism industry. “Tourism will develop whether we like it or not,” he says. “We might as well try to develop forms of tourism in such a way that the negative effects are minimized.”

Obura notes that tourism has been around for so long in the Indian Ocean that many of the local communities are already involved in it in some way. “Many fishers take to guiding tourists on the reefs if they get the chance, as the returns are higher than for fishing, but the work is highly seasonal and their boats don’t often stay in good enough condition for very long,” he says. “For alternative livelihoods, I operate a policy of ‘produce for the local market’ rather than over-dependence on tourism — particularly in a place like Kenya, where the tourism market is so volatile.” The projects in which Obura invests CORDIO time all relate to local or near-market consumption. The food produced in part to protect the nearby reef may also be retained within the household for protein.

Obura says the term “alternative” should not imply a complete switch from one livelihood activity to another, but rather the ability to adopt multiple alternatives or options. “Diversifying household income and food security rather than depending on single activities is perhaps the best way for the poor to withstand shocks and unpredictable events,” he says. 

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## Letter to the Editor

### Dear MPA News:

John Clark is right to be concerned about the closure of areas to fishing and other activities (“Letter to the Editor”, MPA News 5:1). No-take zones should not be seen as the answer to all our management failures. Our focus needs to be on the use of a suite of MPA tools (including closed areas, sustainable multi-use areas, and wider sea-use planning) in relation to the future stewardship of the marine environment.

It is important to remember, however, that controlled and balanced use (sustainable development) does not necessarily protect the structure and function of marine ecosystems or indeed allow for recovery of degraded environments. This is why we need closed areas. The controversy that often surrounds closed areas means that their location and subsequent monitoring usually require full justification, an awareness-raising campaign, and the involvement of local communities and the wider public — much more so than for multi-use areas. This can’t be a bad thing!

I disagree with Dr. Clark’s comment that closed areas are easier to execute: it has taken four years to reach

agreement with local fishermen on the UK’s first statutory no-take zone (Lundy Island) — a site that is not intensively fished. There is also much evidence from overseas of representative areas programs taking many years to implement.

The way we see things potentially progressing in the UK is that rather than re-invent the marine conservation wheel, we make the most of existing legislation including the European Union’s Habitats Directive (which we have already used to designate 23 marine Special Areas of Conservation in England) to appropriately zone our sustainable multi-use sites to include closed areas. Where an ecologically coherent network of sites is concerned, some of these closed areas may well need to be outside of our existing multi-use sites.

### Kate Bull

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### Local MPA Management

By Marion Howard, Fmr. MPA Coordinator, CORALINA

In isolated coastal communities, MPAs can face the challenge of promoting local management without sacrificing expertise. CORALINA, a Colombian government agency that manages natural resources in the nation's San Andrés Archipelago, encountered this challenge when it began work to establish a system of MPAs. The agency was determined to have local people run the project for several reasons, including:

- The need for in-depth local environmental, social, economic, and historical knowledge.
- Islanders' distrust of off-islanders, which could affect project success in ways ranging from an unwillingness to share information to a refusal to accept MPAs or participate in the project.
- Awareness that successful sustainable development projects are rooted in local ownership.
- The project's potential to build local capacity and to empower disenfranchised minorities and women.
- Local poverty and unemployment, so jobs generated would be an important benefit. Resentment would be high if these jobs went to outsiders.

There was little local experience, however, in marine management. Then an idea emerged in project planning meetings with the funding agency, GEF-World Bank: Why not set up a board of international experts to advise the local project team? Thus, the concept of our international advisory board (IAB) was born. To ensure that it was central to project success, creating the IAB became a project benchmark, funds were earmarked, and annual meetings were performance indicators.

Developing terms of reference was the first step. The board's purpose would be simple: to advise CORALINA on developing and implementing locally managed MPAs. IAB members would be expected to advise on their areas of expertise, build staff capacity, and act as contacts with their organizations. Members would be individuals or organizations with expertise in marine affairs, especially MPAs, and in regional environmental issues.


The next step was to identify members. International project partners (namely The Ocean Conservancy and Island Resources Foundation) made recommendations, as did regional bodies, including UNEP and the IUCN World Commission on Protected Areas. After reviewing the recommendations, the project team submitted invitations to several recognized experts who collectively represented a variety of disciplines: planners, managers, social and biological scientists, and legal and policy experts. To promote involvement and manage costs, membership was limited to ten. The IAB took shape, and remains active today.

After setting up the board, CORALINA faced the reality of managing it. Because regular communication is crucial, the amount of effort required can be a challenge. It became apparent that one person should link CORALINA and the IAB, lead the process to determine discussion topics, and organize annual meetings of the board in San Andrés. (The project covers travel costs to board meetings for members.) This job fell to the MPA coordinator and was formalized in the coordinator's contract. Another challenge came in scheduling the annual meetings, given the experts' workloads. Reaching consensus early each year on logistics helps, but there can still be members who are unable to attend.

Board members agree that their role is not to make decisions or define directions. Rather, locally defined project needs determine the topics for consideration. Meetings focus on yearly concerns. To date, these have included zoning objectives and methodology, management bodies, legal and policy frameworks, enforcement, financial sustainability, and examining community-based zoning alternatives.

Board members are the project's international advocates. They generate interest in CORALINA within the international conservation community and help involve MPA staff in conferences, networks, and programs. Most members have spent weeks in San Andrés, and all have supported research and/or developed joint programs with CORALINA through their organizations.

Unforeseen benefits have also resulted. Because local professionals are relatively isolated, information exchange is especially valuable. The project team was immediately struck by the board members' willingness to share information: community relations and the staff's professional style were positively affected by this attitude. Giving presentations at annual meetings and interacting with international colleagues have improved the confidence and validated the skills of local team members. From these interactions, MPA personnel have learned that they, too, are experts.

The IAB process is truly bilateral — advisors and staff learn from each other. Not only is the IAB of inestimable value in MPA development, but contacts made should outlast the project and strengthen community-based management. Ideally, the IAB will play a long-term role in the MPAs. CORALINA's experience is adaptable to other communities facing the dilemma of sustaining commitment to local management. This tool allows internationally recognized experts and local staff to understand the status and future of an MPA, share experiences, discuss alternatives, and work together on an on-going basis. 

#### Editor's note

Marion Howard served for six years as environmental advisor and MPA coordinator for CORALINA, a Colombian government agency. CORALINA manages the natural resources and sustainable development of Colombia's vast San Andrés Archipelago, designated in 2000 as the Seaflower Biosphere Reserve. The marine section of the reserve is 300,000 km<sup>2</sup>.

Howard is now an independent consultant on Caribbean coastal and marine conservation issues, based in the Cayman Islands.

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## Notes & News

### Action plan provides guide for building MPA network in SE Asia

To sustain the high biodiversity and economic value of marine ecosystems in Southeast Asia, a team of government officials, academics, and NGOs has crafted a regional action plan (RAP) to guide establishment of a network of MPAs by 2012. Envisioning a representative and self-sufficient network designed to adapt to environmental change, the RAP provides a portfolio of proposals and implementation strategies, including innovative financing and communications mechanisms.

Rili Djohani, director of the Southeast Asia Center for Marine Protected Areas, chairs the working group that developed the RAP for the IUCN World Commission on Protected Areas. Djohani says the plan addresses existing constraints on MPA management in the region, where experts estimate more than two-thirds of MPAs suffer from ineffective management. "When the plan is integrated strategically, it will help decrease the number of 'paper parks,'" she says. Among other strategies, the RAP endorses a business-oriented approach to MPA management, generating revenues from appropriate resource use for re-investment in site management.

As it stands, the plan is non-binding upon SE Asian governments, although working group members are lobbying for the endorsement of the secretariat of the Association of Southeast Asian Nations (ASEAN). "The key challenge now is to find the resources to support coordination and implementation of the plan among members and with other ongoing regional and national marine conservation programs," says Djohani. To view the RAP and supporting documents online, visit <http://www.iucn.org/themes/wcpa/biome/marine/seasia/seasia.html>. A parallel project to develop a regional action plan for MPAs in the Caribbean region is underway (MPA News 4:10). For more information: Rili Djohani, The Nature Conservancy, SE Asia Center for Marine Protected Areas, Jl. Pengembak 2, Sanur, Bali, Indonesia. Tel: +62 361 287272; E-mail: [rdjohani@attglobal.net](mailto:rdjohani@attglobal.net).

### International MPA Congress to be held in 2005

In late October 2005, a global conference on MPAs will be held near Melbourne, Australia, to be co-hosted by the IUCN World Commission on Protected Areas (WCPA), Parks Victoria, and the Great Barrier Reef Marine Park Authority. Examining best-practice approaches to MPA establishment and management, the First International Marine Protected Areas Congress, or IMPAC1, will aim to develop a blueprint for partnerships among practitioners and stakeholders to ensure sustainable implementation of MPAs. Exact dates for the three-day event have not yet been set. For more information on IMPAC1, send an e-mail to [impac1@parks.vic.gov.au](mailto:impac1@parks.vic.gov.au).

### African leaders call for establishment of community-based conservation areas

In July, African heads of state amended a 35-year-old regional conservation treaty to reflect developments in conservation science and policy, including the planning of protected areas. As now revised, the African Convention on the Conservation of Nature and Natural Resources calls upon African nations to promote the establishment of community-based protected areas and address gaps in the conservation of biodiversity. It also incorporates the IUCN Protected Areas Management Category System in its totality — the first time an international or regional convention has done so.

Adopted by the Assembly of the African Union, the amended treaty covers a wide range of issues, including land and soil, water, biodiversity conservation, and sustainable use. The treaty as revised will enter into force once 15 African states have ratified it. The United Nations Environment Programme and IUCN assisted the African Union in revising the text. For more information: Françoise Burhenne-Guilmin, Senior Counsel, IUCN Environmental Law Centre, Gland, Switzerland. Tel: + 49 228 2692 233; E-mail: [fburhenne@elc.iucn.org](mailto:fburhenne@elc.iucn.org); Web: [www.iucn.org/themes/law/](http://www.iucn.org/themes/law/).

### Global assessment of coastal and marine ecosystems is underway

A worldwide effort is underway to assess the global condition of coasts and marine ecosystems and their impacts on human well-being. To be completed in 2005, the assessments will provide baseline information on the geographic extent of these systems and how decisions on ecosystem use affect human health and economic development. Ideally, the assessments will help resource managers weigh tradeoffs among goods and services of various ecosystems, such as the costs and benefits of converting a marine nursery area to a shrimp aquaculture pond.

The initiative is part of a broader Millennium Ecosystem Assessment that is also examining terrestrial and freshwater systems. Involving scores of researchers from intergovernmental organizations, national governments, academia, and NGOs, the project will determine the condition of ecosystems worldwide, present a range of scenarios for how the quantity and quality of ecosystem goods and services may change in coming decades, and evaluate response options for decisionmakers. "Unlike other global summaries, the Millennium Ecosystem Assessment is looking at the world through the lens of human use and human well-being, as opposed to a more biological view of ecosystem condition," said Tundi Agardy, coordinating lead author of the coastal ecosystems assessment and executive director of Sound Seas, a US-based NGO. For more information on the project, visit <http://www.millenniumassessment.org>.

### Updated version of B2B CD-ROM now available

The Marine Conservation Biology Institute, a US-based NGO, has released an updated version of its "B2B" CD-ROM, providing baseline physical, biological, and social data relevant to conservation planning along the Pacific coast of North America — from Baja California (Mexico) to the Bering Sea. This edition of the software, version 1.1, provides information not featured on a version released in 2002 (MPA News 4:6), including updates of deep sea coral records and bathymetry data, as well as an expanded list of MPAs. The tool is intended to inspire analyses and cooperation among conservation planners using ESRI ArcView 3.x and ArcGIS 8.x products. To order the B2B 1.1 CD-ROM, available for US\$25, contact Sara Maxwell, MCBI, 15805 NE 47th Court, Redmond WA 98052, USA. Tel: +1 425 883 8914; E-mail: [sara@mcbi.org](mailto:sara@mcbi.org).