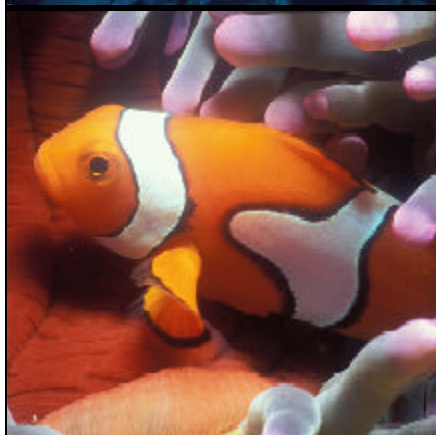
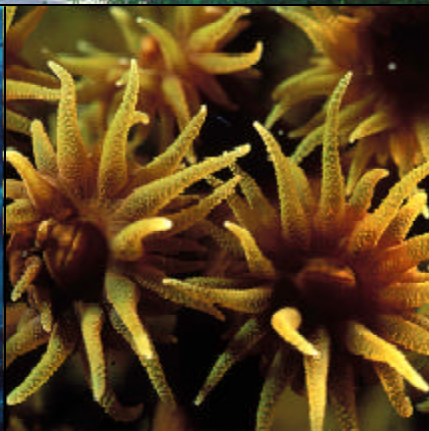
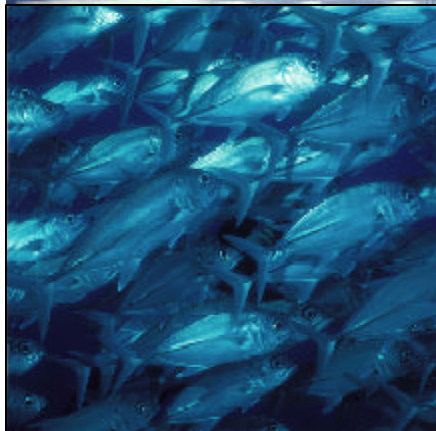


THE EAST ASIA-PACIFIC CORAL REEF CONSERVATION INITIATIVE 2002-2003

**PROGRESS REPORT
FEBRUARY 2003**



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1. Introduction

The International MarineLife Alliance (IMA) is a non-governmental organization devoted to promoting the conservation and sustainable use of the planet's marine resources, with a particular focus on the coral reef ecosystems of Southeast Asia and the Western Pacific. IMA operates small field offices in Fiji, Hong Kong, Indonesia, the Marshall Islands, Papua New Guinea, the Philippines, Vanuatu, and Vietnam with regional staff based in Honolulu, Hawaii.

The East Asia and Pacific Environmental Initiative (EAPEI) has helped IMA implement programs since 1999 combating destructive fishing practices, coral reef habitat destruction and overfishing in reef-associated coastal waters throughout the region.

Partnerships with government agencies, NGOs, research and teaching institutions, community groups and the private sector are a key element of IMA's approach, which seeks the empowerment of effective and sustainable local resource management capacity through broadbased stakeholder support. IMA's tools in each country include:

- Site-based reef conservation with local communities
- Collaboration with and technical support for government fisheries and environmental protection agencies
- Policy research, dialogue and development
- Marine conservation awareness and education programs
- Applied scientific research to support sustainable reef fisheries management
- Monitoring, influencing and transforming the private sector on the "demand side" of the trade in coral reef species.

Our constituency has many elements including the millions of people living in Indo-Pacific fishing communities who depend on coral reef resources for their living; the fisheries and resource managers in national and local governments doing their best to carry out their jobs with meager resources and inadequate access to technical, scientific and management information; and consumers in the United States and elsewhere, who wish to ensure that their purchases of reef-based commodities are not contributing to reef destruction.

IMA's mission is vitally important to the planet's marine ecosystems: The coral reefs of South-East Asia and adjacent island states of the Western Pacific are the most biologically diverse on the planet and make up some 50 percent of the global total. These reefs play an integral role in sustaining the region's coastal fish stocks, and thus serve as an important source of food security and cash income for millions of people in the region's coastal communities. Coral reefs also play an important role in protecting coastlines from wave erosion and moderating the impacts of storms. In many areas, reef-based tourism is also economically significant, and is particularly important for a number of small Pacific Island nations. Effective marine resource management and partnership programs are crucial in maintaining social and economic stability in the region.

Unfortunately, however, coral reefs are under growing threat across the Indo-Pacific. Reefs are rapidly being degraded by human activities and as a result of poor management. They are over-fished, bombed and poisoned. They are smothered by sediment, and choked by algae growing on nutrient rich sewage and fertilizer run-off. They are damaged by irresponsible tourism and are being severely stressed by the warming of the world's oceans. Each of these pressures is bad enough in itself, but together, the cocktail is proving lethal (UNEP, 2001). The reefs of Southeast Asia (nearly 30 percent of the global total) are among the most threatened, with some 80 percent at risk of degradation (Bryant et al, 1998). The reefs of the West and Central Pacific constitute the last relatively pristine reservoir of coral reefs on the planet, but they are also facing growing threats to their survival. The challenge is to stem the threats and establish sustainable management regimes before the Pacific faces the same coral reef crisis that is engulfing much of neighboring Southeast Asia.

IMA recognizes the multiple and interacting threats to the planet's coral reefs identified by UNEP, but also acknowledges that one organization cannot effectively take on everything from watershed degradation to climate change to blast fishing. IMA therefore focuses on the set of threats to coral reefs that are associated with the growing commercial exploitation and trade in coral reef species, and on strengthening capacity at the local level for reef conservation and sustainable reef fisheries management. The trade in reef species is a particularly important threat in Southeast Asia where cyanide fishing for live reef fish is widespread and the extraction and sale of corals and invertebrates is booming. But as reefs are progressively depleted in Southeast Asia, the reef species trade is rapidly growing in the western Pacific, reaching even the most remote and pristine islands and atolls. In areas where IMA is working we are making a significant and measurable difference. However, the US Coral Reef Task Force warning made in 2000 about escalating and unsustainable collection intensities still holds true:

Many coral reef species and resources are harvested globally for commercial purposes including food, the aquarium trade, live fish markets, construction materials, curios, jewelry, pharmaceuticals and traditional medicines. Some of this commercial collection involves destructive fishing practices, such as the use of poisons to capture live reef fish for aquaria and live fish markets. In many cases, the local and regional intensity of collection appears to be occurring at unsustainable levels. The international trade in coral reef species is increasing at a rate of 10-20% per year.

In a continuing effort to help countries throughout the region manage these threats, IMA has implemented the **East Asia-Pacific Coral Reef Conservation Initiative, 2002-3** in partnership with the US Government, private foundations and local collaborators. This report discusses project progress over 2002-3 with CRCI coral reef conservation activities in Hong Kong, Indonesia, the Pacific, Philippines and Vietnam.

Additional information may be found in the following reports and documents:

- Indo-Pacific Destructive Reform Initiative, Narrative Report, March 2001
- East-Asia Pacific Coral Reef Conservation Initiative, Narrative Report, Nov. 2001
- East-Asia Pacific CRCI 2002-3 Program Proposal, November 2001
- East-Asia Pacific CRCI, Progress Report May 2001-April 2002



2. Project Objectives

The project goal of the **East Asia-Pacific Coral Reef Conservation Initiative (CRCI)** has been to protect the coral reefs of Southeast Asia and the Western Pacific by combating destructive fishing practices, reducing over-harvesting of live reef fish and corals, building market demand for sustainably harvested reef species through certification and other means, and assisting policymakers and managers in establishing and implementing durable and sustainable reef management policies and practices in partner countries. Specific project objectives were as follows.

In **Vietnam**, work with government fisheries agencies, local non-government organizations (NGOs), academic and local communities to combat the widespread use of destructive fishing practices in Khanh Hoa and Phu Yen Provinces through coastal resources co-management initiatives, a national environmental education and awareness campaign, and field assessment and monitoring of the live reef food fish trade.

In selected island countries in the **Pacific** that include Fiji, Papua New Guinea, Vanuatu, the Solomon Islands, Tonga, Samoa and Kiribati continue to assist concerned government fisheries agencies and local communities with capacity and awareness building for participatory monitoring and management of the trade in coral reef species and coral reef ecosystems.

In **Indonesia**, continue to work with the Indonesian Ministry of Marine Affairs and Fisheries (MMAF) and an extensive network of local partner NGOs to monitor Indonesia's live reef fish and coral trade, suppress destructive and other illegal activities in that trade, and develop a National Action Plan for live reef fish and coral trade management.

In the **Philippines**, strengthen ongoing destructive fishing programs, assisting local, regional and national fisheries agencies with institutionalizing programs that IMA has pioneered, and ensure that skills and expertise gained over the past decade of work in that country are made available to IMA's partner agencies and organizations throughout the Asia-Pacific region.

In **Hong Kong**, continue the work of IMA-Hong Kong in monitoring the trade in live reef food fish, expanding monitoring to cities in southern China, and other species (lobsters, invertebrates, etc.), also developing policy mechanisms that encourage a sustainable LRFF trade and industry standards that address overfishing, destructive fishing and the sustainable management of the fishery.



3. Curbing the use of destructive practices on coral reefs in Vietnam

Vietnam Project Objectives:

Implement IMA-Vietnam's coastal resources co-management initiative in Van Hung commune, Van Ninh district, Khanh Hoa province.

Curb destructive fishing in Phu Yen province.

Continue ongoing assessment of the live reef fish trade in Vietnam and build government capacity for monitoring and enforcement.

Expand IMA-Vietnam's coastal conservation education, awareness, and management information campaign

IMA-Vietnam's progress towards its objectives has been exceptional. Much of the work is centered in Khanh Hoa Province where the majority of LRFFT and mariculture activities occur. Successful participatory baseline socio economic assessments in Van Ninh District have led to a plan and a series of management interventions by IMA Vietnam supporting both LRFFT reform and broader coastal resources co-management in the province. The Vietnamese are forging ahead strongly with the process first started by IMA in Vietnam and have appreciated the ongoing support of donors. Program objectives have evolved rapidly keeping up with an impressive delivery of outputs first reported on to EAPEI in March 2001. New directions are outlined that have emerged from the work on curbing destructive fishing practices on Vietnams coral reefs.

Coastal management in Khanh Hoa Province

The first objective of IMA-Vietnam's current program of combating destructive fishing in the live reef food fish trade is to implement a coastal resources co-management initiative in Van Hung Commune, Van Ninh district, Khanh Hoa province. This has had a number of different facets.

Facilitation of the first locally-managed marine reserve, ensuring viability of reserve regulations and protection strategies

Supporting the management of the marine reserve, a set of reserve regulations was developed with the contribution of various stakeholders and, most importantly, from the local community with endorsement by local government.

Following official establishment of the Trao Reef Marine Reserve in March 2002, the Department of Fisheries Protection provided a four-day training on marine resources protection management to 22 participants, including members of the Trao Reef Marine Reserve Core Group (selected members of the community), local officials, and community fishermen. As a result, core group members have been able to monitor violations at the Reserve, leading to better coordination between the community and the local government in protection of resources.

Besides performing direct 24-hour protection at the Reserve, the Core Group has been disseminating and orienting the community on the Reserve Regulations as issued by the Van Ninh district people committee, targeting "most vulnerable" fishermen engaging in reef-destruction activities.



Community trainer training course
in Van Ninh district

To support the Core Group in their protection work at the Marine Reserve, a small-scale credit scheme was provided administered through the local agricultural bank. A proper training on the management of the credit was conducted with members. The use of the fund was closely monitored to ensure the effectiveness and commitment to environment protection.

For Core Group conservation and management activities, various facilities have also been made available in the Reserve. A guardhouse was set up at the site and a patrol boat was constructed for their use. The boat launch was organized along with an underwater clean-up in response to World Environment Day. In addition, this group functions through completing a daily logbook and monthly activity plans by which its capacity is step by step strengthened

In October 2002 at the Van Ninh district, two gender training courses were conducted and participated in by a total of 60 communal staff and community members. These courses aimed to increase gender awareness and improve women's capacities in coastal management at the project site. As a follow up, a monitoring system was created and implemented to measure the change in gender awareness of the community

Following the gender training in October 2002, a forum for livelihood alternatives was held. Livelihood experts provided about 60 attendees with information on possible livelihood options in the area.

A Trainers' Training course was also conducted and participated in by selected community members who attended the gender training courses and the livelihood forum. The 10 participants were provided with skills on how to conduct community awareness campaigns and facilitate the implementation of conservation and livelihood programs.

Radio broadcasts were utilized to air updates on the Marine Reserve, inform the greater community on Reserve Regulations, the number of violations at the Reserve,

schedule of training courses and upcoming events spearheaded by IMA-Vietnam.

As a result of these activities, Trao Reef Marine Reserve has become a well known co-management model in Vietnam, serving as a learning ground for many other marine environmental practitioners. The Reserve received visits of about ten delegations from various corner of the country, who come and learn from experience.

Workshops for mid-term review and overview were organized during the project implementation for drawing experience. IMA Vietnam is in the process of the project documentation for lessons learnt.

Environmentally-friendly aquaculture technology development

In the project area, lobster cage culture is seen as the primary local livelihood. But upon closer inspection it is revealed to be an unsustainable practice with numerous weaknesses because it is unplanned and unmanaged. Aimed at averting threats to the marine environment and establishing an economically and environmentally sound model of culture, in July 2002, IMA Vietnam in collaboration with the Institute of Fisheries Economics and Planning (IFEP) conducted a survey, collecting data at 3 specific culture areas in the project site.

A preliminary study was conducted on the environmental effects of lobster culture as an alternative to direct fishing involving 60 randomly selected households growing lobster in cages. The preliminary study showed that water transparency is greatly reduced in areas with a high density of lobster cages. The study also presented the economic factors that lobster rearers need to consider for viability. Further study is needed to have better recommendations on environmentally friendly practices.



Trao Reef Marine Reserve in Khanh Hoa province is the first protected area in Vietnam



Hue, Vietnam country director, presenting the IMA program to the World Bank in Washington D.C.

Viable livelihood alternatives

With the aim of quickly rehabilitating locally found species in Trao Reef Marine Reserve, enhancing biological productivity and creating a foundation for developing livelihood alternatives, IMA Vietnam has been investigating the possibility of local species mariculture. Recently, ICLARM together with Research Institute for Aquaculture 3 (RIA3), approached IMA Vietnam with a proposal to trial the culture of sea cucumbers, *Holothuria scabra*, in IMA's project site. This species was once found in the area but has been overexploited due to its high economic value. In June 2002, ICLARM, RIA3 and IMA Vietnam came to an agreement on the conduct of this study.

2000 juvenile sea cucumbers were outplanted by the end of July 2002. The growth of the sea cucumbers was then monitored by the community for a period of 4 months. Also being tested are green mussel culture and seaweed.

More than one hundred kg of commercial size sea cucumber has since been harvested. The success is attributed by the close protection by the Core Group with the active support provided by the local community. The rest of the trial sea cucumber is retained to serve the rehabilitation purpose.

Community-managed coral farm

An awareness campaign was launched by the local community on the need to rehabilitate the coral reefs in the area. As a result, many community members took part in a participatory survey for site selection and preparation work. Some artificial reefs were placed in the water to research establishing a coral farm in the locality. The whole process was monitored by the local community. Recently, raised coral fragments have been transplanted/translocated into the Trao Reef Marine Reserve.

Local capacity building and networking

The Management Board organized at the district level has steadily provided excellent support to the management of the Trao Reef Marine Reserve. They have been coordinating all activities at the project site.

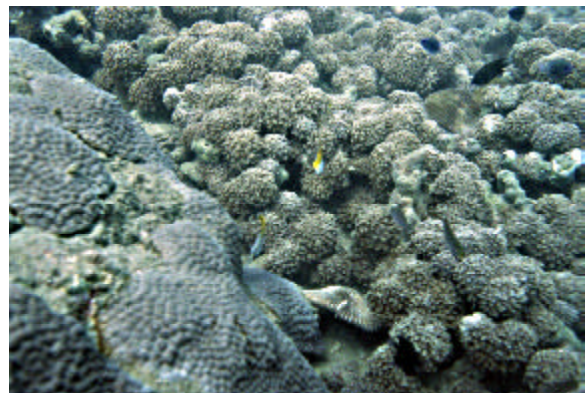
A network of local consultants formed for mobilizing professional ideas of local scientists and government officials is helping to provide technical supports to the project.

IMA Vietnam has developed an indicator system for monitoring work in the site in terms of institutional, operational and environmental aspects.

Curbing destructive fishing in Phu Yen province.

Orientation on the Reef Trao Marine Reserve

In June 2002, in collaboration with the Institute of Oceanography, a workshop on the importance of coral reefs for coastal communities was held in Phu Yen province, attended by PACCOM (People Aid's Coordination Committee), Phu Yen Department of Science Technology and Environment and some 50 community members. The workshop also served as a venue for orienting the participants on the significance of the establishment of the Trao Reef Marine Reserve in Khanh Hoa province. In the wake of the workshop, Reef Trao Marine Reserve Management Board received requests to organize study tours to the field site from Phu Yen provincial officials.



Live coral cover in Taro Reef



Floating cages for live grouper in Hai Phong

Ongoing assessment of the live reef fish trade in Vietnam and building the capacity of government for monitoring and enforcement

Analysis of policies and regulations relating to the LRFT in Vietnam

In August 2002, all information relevant to the LRFT in Vietnam has been identified and categorized for use. Information collected from international sources was classified as follows: IMA International Information, Regional Trade Overviews, Country Status Reports, Strategy Development and Destructive Practices, Species, Spawning Aggregations, Industry Standards and Best practice, Aquaculture, and the LRFT Bulletins. Information relating to the LRFT in Vietnam was classified into: Overview of the LRFT in Vietnam, Fishing Methods, Legal Issues, Aquaculture and Trade.

Initial LRFT species identification

In August 2002, IMA-Vietnam identified biologists (experts in fish, mollusk, shrimp, lobster and coral) to collaborate with. Ho Chi Minh city and Hanoi have been identified as good sites to assess ornamental fish. Quang Ninh, Hai Phong, Phu Yen, Khanh Hoa and Vung Tau have been identified as good sites to assess food fish.

Joining forces with the Research Institute of Fisheries Products, IMA-Vietnam organized two 6-day trips in July and September 2002 to Nha Trang and Cat Ba for fish sampling of major LRFT species.

Identification and assessment of the LRFT export system in Vietnam

Profiles of 46 major fish traders/exporters in Vietnam have been completed and contacts have been established to enjoin them in the goals and objectives of IMA-Vietnam

Dialogue development between stakeholders and government agencies

IMA-Vietnam works closely with the Fisheries Protection Department of the Ministry of Fisheries on LRFT reform. IMA-Vietnam continues to facilitate dialogue between government agencies and other stakeholders involved in live reef fish trade in the country.

Expand IMA-Vietnam's coastal conservation education, awareness, and management information campaign

World Environment Day, June 5, 2002

Simultaneous activities were held in Hai Phong City, Quang Ninh, Phu Yen and Khanh Hoa in celebration of World Environment Day last June 5, 2002, participated in by some 2,500 people. Joining forces with IMA-Vietnam were Project Aware Foundation, Fauna and Flora International (FFI), the Center for Rural Progress (CRP), and government agencies such as the Fisheries Resources Protection Departments (Mofi) and the Departments of Science, Technology and Environment (DoSTE) in Haiphong, Quang Ninh, Phu Yen and Khanh Hoa. These events were widely broadcasted through the Vietnam National Television (VTV1), and The Voice of Vietnam radio channel. Articles on these IMA-Vietnam initiated activities had been also been featured in The Vietnam News, Lao Dong (Daily Labour) and the Vietnam News Agency.

In the North in Hai Phong, a workshop on the Establishment of the Cat Ba Biosphere Reserve was held and participated in by nearly 50 people representing local authorities and NGOs. The Hai Phong DoSTE will work with the Tourism Department for a proposal to be submitted to the United Nations Educational, Scientific and Cultural Organization (UNESCO) on the establishment of the Cat Ba Biosphere Reserve. Also in Hai Phong City, nearly 300 people composed of residents and representatives from the Cat Hai District People's Committee, the Hai Phong DoSTE and some other relevant agencies participated in a residential cleanup of the Phu Long Commune and sea pine tree plantation.

In Quang Ninh, the Cua Van fishing village held a residential cleanup. In cooperation with the Quang Ninh DoSTE, a coastal cleanup and pine tree planting at Tra Co beach were held, including the launching of the new conservation boat of the Fauna and Flora International (FFI).

At the Trao Reef Marine Reserve in Khanh Hoa, World Environment Day activities included a cleanup at the Reserve and the launching of a patrol motorboat.

Dive-in to Earth Day

Joining the international campaign with marine conservation activities. IMA Vietnam organized activities in Nha Trang City, Khanh Hoa province and at the project site, Van Ninh district, Khanh Hoa province. The activities planned are (1) crown of thorns starfish removal at coral reefs around Hon Mun island in partnership with Hon Mun MPA Project and Khanh Hoa Department of Science Technology and Environment, (2) marker buoy installation at Trao Reef Marine Reserve and (3) Lobster Cage Clean-up in coordination with the district and commune People's Committee, Project Management Board, Border Station 362 and Fisheries Resources Protection Station. Around 600 people took part in this activity day.

Information, Education and Communication (IEC)

IMA Vietnam has developed its own website (<http://www.ima-vietnam.B2vn.com>) and quarterly newsletter in both English and Vietnamese, in which news of field progress and organizational philosophy is disseminated nationwide for sharing information, possible support and new opportunities for cooperation

One thousand (1,000) copies of the Trao Reef Marine Reserve brochure and papers committing to comply with the Reserve regulations were printed and disseminated to local people, visitors and the general public.

Three thousand five hundred (3,500) leaflets on the coastal cleanup activities have been produced and disseminated for environmental awareness events.

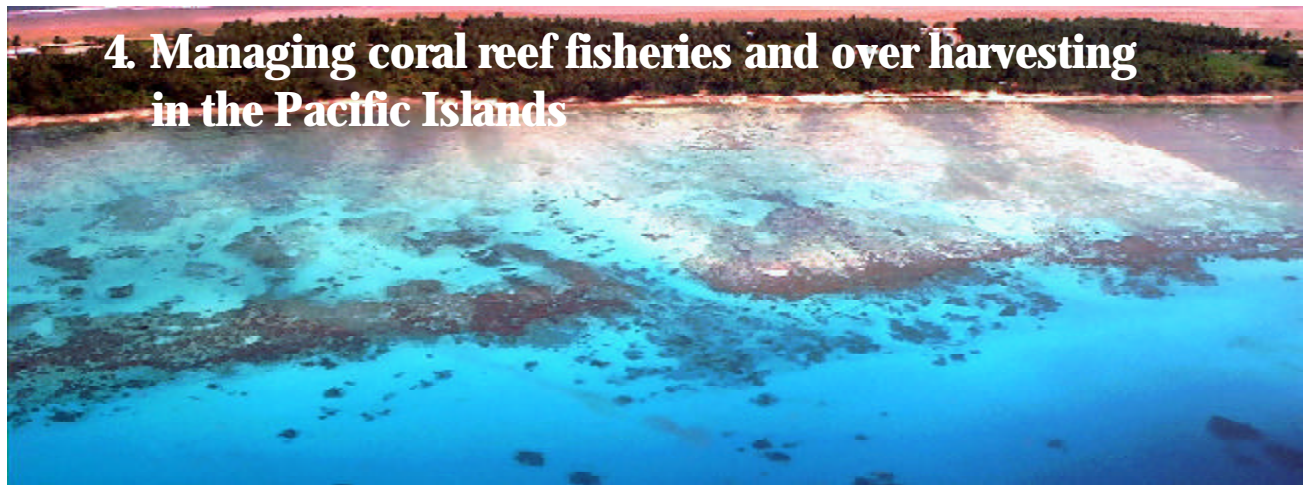
The Coral Reef Education for Students and Teachers (CREST) manual has been translated into Vietnamese and is now ready for printing and distribution.

Documentary film on coral reef conservation.

A 30-minute Vietnamese documentary literally translated as "Rural Areas Nowadays" is being shown on the Vietnamese National Television (VTV1). The film showcases IMA-Vietnam's community-based approach on the establishment and management of the Trao Reef Marine Reserve.

Locally-established Communication group and Trash collection Group.

As a consequence of the local awareness activities organized by IMA Vietnam, the local community itself set up a communication group to support Trao Reef locally-managed marine reserve. Clean-up of their residential areas becomes a frequent practice. A trash collection group was established, for which the local people committed not littering trash and are willing to pay trash collectors a modest amount of money monthly.



Pacific Islands Project Objectives:

Build local capacity in key Pacific Island countries for managing trade in coral reef organisms so that it is environmentally sustainable and non-destructive.

Build local capacity in target Pacific Island countries for raising awareness about coral reef ecosystem conservation and sustainable use.

IMA continues to be the main non-government organization in the Pacific Islands focusing solely on the problems of destructive fishing, overfishing and habitat destruction on coral reefs. All of our work is carried out in partnership with local governments, communities and regional organizations in the Pacific Island countries where we are working. These include PNG, Fiji, Vanuatu, and the Marshall Islands where IMA has ongoing projects operated by local staff. Regional technical support and administrative services are provided by IMA staff and associates in Honolulu, Guam, Australia, Hong Kong and Washington DC. In the last few years, IMA's advice on destructive fisheries issues has been used in almost all of the countries in the Pacific.

Managing Fiji's destructive coral trades

In Fiji over the past year IMA has spearheaded a national assessment of the trade in live corals, live rock and other coral products. Concerned about the impact the aquarium and curio coral trades were reported to be having, the Fiji Government in early 2002 asked IMA to scientifically investigate and make recommendations about Fiji's coral collection activities and their sustainability. The majority of Fiji's corals and live rock are exported to the US. It was opportune, given EAPEI funding, for IMA to be respond

quickly to Fiji's request, engaging scientists from Honolulu's Bishop Museum (coral ecologist), Townsville's James Cook University (fisheries economist), and Suva's University of the South Pacific (USP - sociologists), matching them with local NGO, government and community counterparts for capacity building associated with the coral trade assessment and management. The IMA team, together with communities and chiefs involved throughout Fiji identified live rock and curio coral harvesting as being destructive. Curio coral (mostly acropora and porites species) has for years been harvested live, bleached and shipped out by the container load, causing significant and visible impacts in harvesting areas. Live rock harvesting by communities has also seriously altered reef habitat and fishing areas. A thousand tons of live rock was imported into the US from Fiji in 2001 (NOAA pers. comm.), and considerably more was crowbarred from the reefs by communities desperate for income and unconcerned (or unaware) about the high wastage and impact. Exporters have been able to take advantage of this situation.

Live coral harvesting for the aquarium trade on the other hand - which is carried out by selectively harvesting coral colonies - did not appear to be having a measurable impact when compared to unharvested areas. Mariculture



Pacific LRFFT - destructive or not?

alternatives for both live rock and coral are available. These findings are currently being reported to the Fiji Government. Given conflicts associated with this industry in Fiji, throughout the study IMA has emphasized strengthening the local management process. (vs. consultants' "reports"). This should lead to more sustained and effective local management, as well as more environmentally conscientious decision making.

The environmental and economic impacts of these trades are of great concern to the Fijian people. There is considerable opposition locally to these trades, stemming from conflict with Fiji's tourism industry, and the environmental sector. However, there is also wide recognition about the value of the current export trade, and strong awareness that a sustainable trade can provide critical foreign earnings. Overseas concern is also running high, with CITES requiring Fiji to reduce export levels by upto 100% until a management plan is in place for sustainability. So, IMA's assessment comes at an important time for Fiji.

Live food fish trade issues in the Pacific

Similar problems have been taking place in the management of the live reef food fish trade (LRFFT) in the Pacific Islands. IMA emphasizes that there is a fundamental conflict between this trade and subsistence fisheries in all the Pacific Islands. The LRFFT becomes destructive by targeting grouper spawning aggregation sites and intensively fishing all size classes of groupers, coral trout and Napoleon Wrasse. The latter is now endangered through out its range, and is being specifically targeted by live reef food fish traders in the Pacific. In isolated locations cyanide is routinely used, and in places where cages are found subsistence fisheries are targeted to feed the penned fish. Countries, unaware of the magnitude of the impacts to fisheries and ecosystems, are readily granting foreign LRFFT companies and fishermen access to their reefs and fish stocks that should be reserved for local needs. Isolated reefs are the first to be handed over and these are deliberately heavily fished (and overfished) by the Asian fishing companies since they have so far been

able to find another reef ecosystem to move on to. PNG, Fiji, the Marshalls Islands, FSM and all the island groups in Melanesia and Micronesia are being targeted.

Such trades easily become established in the pro development islands, and because of limited capacity in government to manage initiatives and regulate such developments the environmental impacts tend not to be managed or mitigated. Once social-governmental and overfishing problems emerge the traders move on quickly.

The live reef food fish trade remains one of the most destructive fishing practices occurring on reefs in the Pacific and one of IMA's top priorities under its Pacific regional coral reef conservation program. Region wide assessment has shown the trade to be emerging in PNG and Fiji, and to be virtually out of control in the Marshall Islands. Countries such as Vanuatu, Tonga, Cook Islands, Samoa, Tahiti and Kiribati's Kiritimati (Christmas) Island have chosen not to allow this trade. Vanuatu, Tonga and Kiritimati made the decision against the industry after resource assessments were carried out by IMA and SPC (Secretariat of the Pacific Community). In all such situations, given IMA's core US government and foundation support IMA has been able to mount timely and strategic responses helping governments and communities combat the destructive aspects of the live reef food fish trade, especially where they are fast moving.

Given the transitory boom-and-bust style of the LRFFT in the Indo-Pacific region, IMA has had to become successful at working with the trade in its different phases. IMA seeks to reform the LRFFT where it is already being practiced. However, in frontier locations such as the Pacific where it is likely to become quickly destructive, IMA actively seeks to discourage the LRFFT from becoming established. IMA's LRFFT program is essentially on track in the Pacific guided by a strategic plan and adhering strongly to the precautionary principle for managing fisheries.



Hong Kong vessels still travel as far the Marshall Islands to collect live groupers

Implementing precautionary and community-based management approaches in PNG, Vanuatu, Fiji and the Marshall Islands

IMA's Pacific Program is currently supporting live reef food fish conservation projects in PNG at Kavieng in New Ireland Province, in the Marshall Islands (on Enewetak and other atolls), and in Fiji where commercial live reef fish initiatives show signs of continuing. NOAA's Coral Reef Conservation Grant Program is assisting IMA's work in the Marshall Islands - a US Freely Associated State. Earlier commercial attempts by SE Asian companies to start LRFFT activities in Vanuatu and Tonga appear to be over for the time being, thanks to senior fisheries personnel in those countries adopting intelligent and precautionary approaches aimed at protecting subsistence fisheries. LRFFT activities in Kiribati and the Solomon Islands were last reported to be on hold.

The activities under this project were designed to promote and uphold a precautionary approach to this trade in the Pacific. This FAO approach to fisheries management is useful in situations where fish resources need protection. In the case of the LRFFT in the Pacific, fish resources are being commercially targeted without adequate information and management existing thereby leading to inevitable and rapid overfishing. Depletion turns out to be irreversible for many of the targeted species like the Napoleon Wrasse and the larger groupers. Use of slot limits and SPAG protection measures can assist in this situation (PNG currently, for example).

A key precautionary step - missing from most LRFFT developments - has been the decision to undertake baseline assessments of fish stocks, subsistence use and biological requirements before allowing commercial fishing. Helping countries and regional organizations undertake such assessments and build capacity for more extensive assessment has been a central part of IMA's approach.



Children participating in education and awareness workshops in Kavieng, PNG



Enewetak women's group at LRFFT awareness meeting

IMA's Pacific Program has continued to make excellent progress during this project at the community level in PNG and in the Marshall Islands, working hard and creatively to implement a precautionary and conservation-based awareness approach at the local level in LRFFT targeted areas. Work at the national and international levels with fisheries development organizations has seen mixed results under our conservation mission. Overall our work is benefiting the coral reefs, species of fish and communities targeted by this trade. More people are becoming informed about the need to develop the LRFFT sustainably or not at all. However, there is still much more work to be done and a continuation of funding programs is crucial if the Pacific Program is to consolidate and sustain the initial successes, and if critical reef fish resources are to be conserved and given some level of managed protection in the Pacific Islands.

The next steps in the central, equatorial and south-western Pacific include more extensive monitoring of the trade activity and cyanide use in isolated islands (especially the Marshalls). We are also looking at the use of ecosystem models for predicting baseline fish populations and assessing fishing pressure to determine if LRFFT operations can become sustainable or not, and to reduce the destructive impact in places where the trade already operates. We are also helping to identify the most appropriate and easy-to-implement regulations such as minimum and maximum size limits, closed areas, seasons, data collection, local fishermen and observer trainer programs.

The focal point for such work has been the community "management plan", particularly where national governments are allowing this trade but ignoring the requirement for implementing an effective management, monitoring and regulatory program in harvest areas. A community focus helps to offset government lack of capacity. Once taught and supported with the basics, communities can carry out their own zoning, permitting, monitoring and bottom-up planning and banning. IMA has been increasingly

successful with this approach during 2002 in PNG (Kavieng - EAPEI) and the Marshalls (covered by NOAA funds). In PNG the issues have included a lack of community awareness about the trade and minimal consultation between national government and communities before lifting the moratorium and adopting national legislation permitting the trade in 2002. Responding to such gaps, IMA in partnership with Ailan Awareness a fisheries NGO in New Ireland Province has been able to improve community awareness about the need for management and controls, and the need to protect species such as the Napoleon Wrasse and spawning aggregation sites. The integrated approach has in turn led to a demand for (and good local understanding of) community-based fisheries management plans in each location, including Kavieng and Enewetak Atoll in the Marshall Islands. The Marshallese national and local governments have been very supportive of a collaborative approach to developing fisheries management plans for all of their islands. Unfortunately in Fiji, the government fisheries division has been encouraging new trials in the Lau islands - halfway between Fiji and Tonga- and are renewing interest in the LRFFT after IMA and SPC carried out an assessment of the archipelago in 2001 showing a paucity of stocks, which led to a chiefly ban in Lau (which may turn out to be temporary). Fortunately, IMA-Fiji is well-placed to respond to government and community needs on this issue.

Similarly in PNG, communities near Kavieng (in New Ireland Province) knew virtually nothing about the live reef fish trade for a number of years after trials were permitted by the National Fisheries Authority. This situation improved considerably during 2002 and the lifting of the moratorium, as a new partnership between IMA and a local Kavieng NGO – Ailan Awareness – got off the ground with funds raised from the New England Biolabs Foundation.

Ailan Awareness held community based workshops in areas where the trials were taking place enabling communities to learn more about the trade’s tendencies to over-fish important reef species. Once they understood more clearly the impact of the operators of this trade (Chinese owners utilizing Filipino fishermen), and the biological characteristics of the target species, communities became very concerned about the likelihood that their stocks of napoleon wrasse, groupers

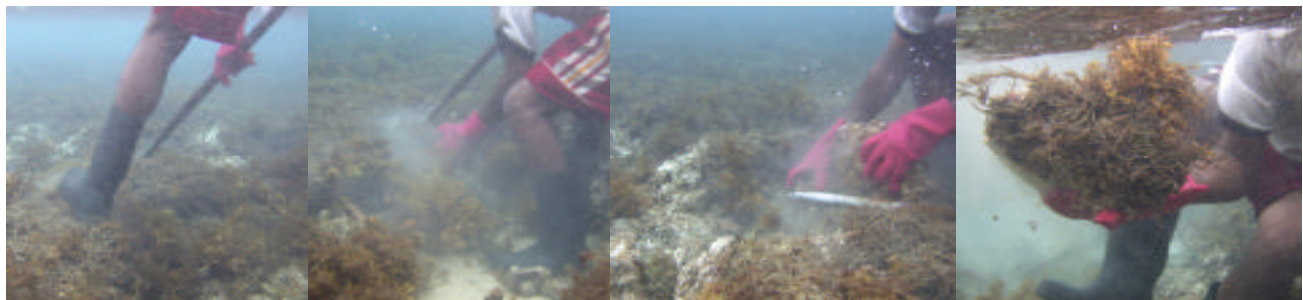


By-catch high and competing with subsistence

and other fish would be over-exploited. As a result of the village-based workshops being organized by Ailan Awareness, communities are now petitioning the national and provincial government to stop the operators until surveys of their fish stocks can be completed. They say they were never consulted about this trade, yet the NFA recently passed national level legislation permitting expansion of the trials.

IMA data from Hong Kong tracking monthly imports from the Pacific Islands showed a down turn in supplies from Papua New Guinea and Fiji during 2002, confirmed in the field, suggesting that IMA’s partnership programs to curb the trade unless properly managed may be bearing fruit. However, significant and very worrying quantities of fish are reported coming from the Marshall Islands - see Hong Kong Data table for 2002 imports.

In the Marshall Islands, under a recently secured grant from NOAA IMA has begun to help the Marshallese transform what appears to be a largely unmanaged live reef food fish operation harvesting tens of thousands of groupers, Napoleon Wrasse and coral trout annually from the remote



Destructive live rock harvesting in Fiji - communities need sustainable livelihood alternatives

outer islands of the Marshalls for export to Hong Kong. These shipments are being tracked by IMA in Hong Kong when they enter the Asian market and 2002 figures appear on the data table shown in the Hong Kong section of this report.

Unfortunately, on remote Marshallese atolls such as Enewetak few local people appear to benefit from the foreign-operated harvesting operations, which are now over-harvesting reef fish, targeting spawning aggregation sites, and competing heavily with a critical subsistence-based lagoon fishery. Local people are complaining about poor catches from their traditional fishing grounds in the vicinity of population centers where the live fish operators have been netting fish to feed to the thousands of caged groupers. Cyanide is also reportedly being used by the Filipino live reef fishermen, adding considerably to the negative impact that this trade is having in the country. A number of the remote islands and atolls are involved, and IMA is moving as quickly as funding permits to reach out to these island communities to offer support, capacity building and more effective management and monitoring of this trade.

On Enewetak, under the NOAA-funded project, IMA has formed a partnerships with the Island Council, chiefs, women and youth groups, and schools on the island, enabling IMA's local Marshallese and regional program staff to help the islanders develop a participatory fisheries management (zoning) plan for the lagoon island to raise awareness and help manage the trade should they chose to keep it. The College of the Marshall Islands (CMI) Marine Studies Program is also a partner in the project providing valuable local backstopping for the initiative. Recently, IMA helped secure US Dept. of the Interior funding for CMI to employ a lecturer in marine studies and conservation.

Solving overfishing

The most chronically extensive fisheries issue and threat to coral reef ecosystems and village society in the Pacific is overfishing. Under its strategic planning initiative, IMA recognized and prioritized the threat of overfishing alongside destructive fishing and habitat destruction issues as compromising coral reef integrity, livelihood sustainability and food security. Destructive fishing and habitat destruction have been discussed above in relation to the live reef food fish trade where destructive practices are utilized, and in relation Fiji's coral trade which has become destructive to habitat. There has been a definite need for an NGO in the Pacific to focus on helping governments and communities combat overfishing. IMA is lading a number of new responses to this threat.

Interventions and awareness materials developed for the live reef food fish trade issue are directly applicable to the overfishing problem leading to a high level of cross-fertilization under IMA's programs in developing solutions.

IMA is developing information from Hawaii, PNG and Australia for determining minimum and maximum size limits for fish to be presented to government fisheries officers in the region for training purposes and for integrating into community-based fisheries plans that can govern all marine resource use and help solve overfishing locally in coral reef ecosystems. Under such plans, local controls can also be applied to fishing gears such as small mesh nets which target juveniles and excessive quantities of fish, or spearfishing at night using scuba and flashlights causing parrotfish to be overfished in many islands, and also the localized use of poisons such as bleach in Micronesia and Polynesia or "poison rope" the traditional rotenone used in Melanesia. In both PNG and the Marshalls, following our awareness programs and understanding, communities and governments are prepared to give the Napoleon Wrasse the necessary protection through community-based plans. Paving the way perhaps for national level protection. Marine reserves and no-take zones are also an integral part of community-based plans helping stocks to recover and critical habitat to be protected, and awareness to be developed about conservation through a visible and quantifiable recovery of reefs and fish populations when they are placed under such controls. In Hawaii, IMA is participating in the growing statewide initiative to find ways of placing 20% of the state's coasts under protection. This is fertile ground for developing strategies and technical solutions directly applicable to other Pacific Islands and vice versa.

In conclusion, IMA in the Pacific is showing good progress helping to build management capacity and awareness about the trades in coral reef species and their destructive impacts to resources and habitat. By working with communities, IMA has encouraged national and provincial governments to start paying attention and to participate more productively in helping to preserve coral reef ecosystems and implement measures for sustaining valuable fisheries resources. EAPEI support for this program has been fundamentally important. Significant opportunities exist for effective expansion of this cooperation and support program, and for continuing successful implementation of coral reef conservation strategies and partnerships leading towards greater social and economic stability in the Pacific Region .



5. Monitoring and managing coral reef species trade in Indonesia

Indonesia Project Objectives:

Gather information and monitor the exploitation and trade of coral reef species.

Develop co-management plans for sustainable “chain-of-custody”-based reef fisheries in collaboration with local partners at specific learning hubs.

Develop effective policy and institutional capacity for the sustainable management of reef species exploitation and trade at national, provincial, and district levels.

Raise key stakeholder and public awareness of IMA-Indonesia’s goals and programs.

Develop the capacity of IMA-Indonesia, including institutional development, staff career development, and fundraising.

The primary focus of IMA’s Indonesia program is on monitoring and reducing the destructive impacts of the trade in live reef fish and other reef species.

Gathering information and monitoring the exploitation and trade of coral reef species

Given the size of Indonesia and the scale of the trades in coral reef species a fundamental part of monitoring in Indonesia is developing a network of people providing monitoring data and information. During the reporting period, IMA has continued to support and play a major role in a network of NGOs and government agencies engaged in monitoring this trade, for which there is little reliable data.

In addition, through the same communication processes, IMA-Indonesia has developed an extensive and broad-based network of stakeholders with which to share the information, and to develop solutions and collaborate on projects addressing the live reef species trade.

Indonesia is host to the most pervasive destructive coral reef fishing practices anywhere in Southeast Asia. In this vast country of some 17,000 islands, IMA-Indonesia does not pretend to have directly or significantly reduced the threat of destructive fishing in the country. Indeed, five years and millions of dollars, channeled through the World Bank’s Coremap program, have not done that. However, in common with other places where IMA works, IMA-Indonesia has been effective in raising the profile of the destructive fishing issue, and in building a network of concerned and informed individuals and institutions – including NGOs, government agencies, and private sector actors – who want to do something about it. This networking strategy, and the approach of working with a wide range of stakeholders, notably the live reef fish exporters, has established a sound foundation on which to base local conservation action in the field.

What has been “left behind”, so far, by IMA-Indonesia’s work is a network of NGOs, concerned government officials, and reform-minded private sector actors who have agreed to work together to address Indonesia’s serious destructive fishing problems. Needed now is the policy framework and



Live grouper cages in a village in Manado

funding to mobilize this network in the field, expand it, and strengthen it. Recent discussions between IMA's Washington-based Vice-President and the World Bank Task Manager for the Coremap II project (more than \$40 million, due to begin in October 2003), indicates that there may be important opportunities under Coremap II for mobilizing this network over the coming several years.

Currently, IMA Indonesia's role is best suited to act as facilitator and strategic hub of a broader network of actors in the live reef fish trade. The inability to undertake intensive field activities due to financial and geographical constraints has pushed us to work more strategically in network building to address the geographical challenge of Indonesia. IMA is poised to conduct and facilitate more intensive fieldwork and feels that opportunities for interfacing with communities and exporters continues to be an important avenue for reforming the trade in coral reef species, and hence contributing to the conservation of Indonesia's coral reefs.

By providing a leadership role for this network, IMA-Indonesia has been able to leverage its relatively small budget into an increasingly effective monitoring system, focusing on three major international gateways for the trade - Jakarta, Bali, and South Sulawesi.

The monitoring data from the field, along with secondary data, was incorporated into the 2002 version of the *Country Status Overview on Reef Fisheries in Indonesia*. While this report has been completed and disseminated in Indonesia, lack of financing has meant that IMA has not been able to properly publish it, or get it translated into English. Data collection and monitoring in the three gateway areas of Jakarta, Bali, and South Sulawesi are ongoing, with much of the data coming from exporters who IMA and its partners have cultivated as informants.

Tracking live reef food fish activities in Eastern Indonesia

Data from East Nusatenggara is being collected with assistance from an exporter of cultured groupers in that area. In addition, live reef fish trade practices in Southeast Moluccas are being tracked through information provided by a knowledgeable LRFFT exporter in Makassar (South

Sulawesi). These trade activities take place around South Sulawesi on the rich coral reefs found in the Banda Sea area. Here there is also considerable use of destructive fishing such as dynamite and cyanide. IMA's networking provides an important link to these issues and places.

In Kendari (S.Sulawesi), an NGO called Yascita is providing regular data inputs, tracking the trade routes of live reef fish from the key reef area of Wakatobi to Makassar. Yascita has also incorporated data on the trade in green turtle (*Chelonia mydas*) in that region.

Sulawesi is a large tropical island sitting at the center of the Earth's most diverse ecosystem on earth. The equatorial island lends its name to the Sulawesi Sea on the northern side of Indonesia. This sea provides biodiversity linkages between the diverse reefs of Sulawesi Island and the equally diverse reefs of the Southern Philippines (underpinning the bioregions concepts promoted by WWF). IMA's partnerships in this area are strategically important for getting information out and vice versa.

Manado is the main city in N.Sulawesi, where Yayasan Kelola, a local NGO, has been providing IMA-Indonesia data, including reports about the illegal capture of humphead wrasse (*Cheilinus undulatus*) in Bunaken National Park.

Integrated data system being developed

Through the Indonesia National Development Planning Board (Bappenas), IMA-Indonesia had an opportunity to develop an integrated data collection protocol for the reef species trade, which Bappenas has agreed to test and eventually utilize.

The Bappenas data directorate has reviewed the data collection structure, and the resulting data collection form has been widely disseminated to IMA partners, and to constituents of other major NGO networks.



Cyanide destroyed reef in Spermonde in Southern Sulawesi

Some of the planned monitoring field activities that are being jointly implemented with local partners in Sulawesi and Bali were hindered by financial constraints. Activities are proceeding well in South Sulawesi with two local NGOs (Lemsa or Lembaga Maritim Nusantara, and YKL or Yayasan Konservasi Laut), and in Les Village, Bali, with Bahtera Nusantara, a local NGO.

The information gathered through these monitoring activities is systematized and stored in the IMA-Indonesia database. It also feeds into the Country Status Overview series.

2002 Country Status Overview



Expanding on the 2001 *Country Status Overview* – which focused on the live reef fish trade – the 2002 version deals with broader marine ecosystem degradation issues, particularly on the north coast of Java and in the Riau archipelago. The 2002 effort has also incorporated results from a participatory discussion process with stakeholders involved in grouper mariculture. In 2002, most

efforts for the Country Status Overview were focused on compiling secondary data, particularly for the non-fishery chapters dealing with broader threats to marine environment.

With support from USAID's Indonesia Natural Resources Management Program, a series of writing workshops (grouper mariculture; threats to marine environment) were held in Jakarta as part of the preparation of the Country Status Overview 2002. In truth, not too much that was very substantive came directly out of these workshops, but they were useful in recruiting a good number of additional people and institutions to serve as data and monitoring informants for the networking.

The final draft of the Country Status Overview was finalized in April 2002. However, validation of certain chapters was not carried out because of financial constraints, which restricted IMA's ability to travel in the field.

Other partnerships

Funding by ASEAN Regional Center for Biodiversity Conservation (ARCBC) allowed IMA-Indonesia to conduct field studies on biodiversity loss due to destructive fishing practices in the Spermonde archipelago, South Sulawesi. Working with a consortium of local NGOs and Hasanuddin University, this project conducted socio-economic and biological assessments on a number of islands in the archipelago.

The project started in November 2001 with preliminary field studies completed in December 2001 and January 2002. Unfriendly weather delayed the project, but soon resumed in February 2002 with the final fieldwork completed in July 2002. Data from ecological surveys and Participatory Rural Appraisal (PRA) were reported in preliminary fashion in IMA's semi-annual report to ARCBC in mid-2002.

An important achievement of IMA-Indonesia during this reporting period has been the building of constructive relationships with a number of live reef fish exporters in the country. One exporter has approached IMA to assist in developing a sustainable grouper mariculture project in East Nusa Tenggara. Another has expressed interest in working with IMA partners in the Kei Islands of Maluku to export cyanide-free groupers. IMA is keen to explore these possibilities in 2003, pending sufficient funding.

IMA-Indonesia was also actively involved in a grouper working group meeting in October 2002, initiated by the BPPT – Indonesia's Technology Assessment and Application Board. One concrete result of this workshop was the selection of Batam Island (near Singapore) as a center for grouper mariculture development. The Indonesia Business Association (HIPMI) has asked IMA-Indonesia to assist them in preparing a business plan to pursue the opportunity.

In Bali, IMA and a local partner (Bahtera Nusantara) were successful, in October 2002, in persuading a group of local marine ornamental fishermen to agree to establish a community-based enterprise to provide cyanide-free ornamental fish to the US market. An exporter is assisting in this effort, and has begun contacting buyers in the US to seek potential markets.

IMA-Indonesia has also been active on the policy front, introducing and promoting the LRFFT industry standards initiative (discussed in the Hong Kong section of this report) to key officials in the Ministry of Marine Affairs and Fisheries. Indeed, one of these officials accompanied the IMA-Indonesia director to participate in the LRFFT Standards Workshop coordinated by IMA-Australia and held in Townsville, Australia in August 2002 (also discussed in the Hong Kong section.)

The 4th and final Preparatory Committee for the World Summit on Sustainable Development (WSSD) was held in Bali in May 2002, and IMA-Indonesia played an active role in the parallel meeting of the Indonesian People's Forum. IMA-Indonesia's Network Coordinator was a main organizer and Focal Point for the Fisherfolks Major Group discussions. Papers coming out of these meetings were incorporated into the "Shadow Report" on Prepcom IV prepared by a coalition of NGOs involved.

6. Strengthening and institutionalizing destructive fishing reform in the Philippines



Philippines Project Objectives:

Continue community-based destructive fisheries reform and coral reef conservation initiatives to ensure the non-destructive and sustainable use of coastal resources and an improved quality of life for coastal communities.

Maintain and expand the monitoring protocol of live reef fish trades (LRFT) in collaboration with community, industry, government, NGO, and university partners and stakeholders.

Continue IMA-Philippines' environmental information, education and awareness campaign.

The Philippines Program is IMA's oldest and longest running program. Much of IMA's work in other countries across the region stem from models first started by IMA in the Philippines. The Philippine program still serves as a regional hub for other IMA country programs by providing expertise in fishermen's training, monitoring and inspection of the live reef fish trade (LRFT) and education programs. They also assist in data processing, graphics and video productions.

As discussed in this report, most of the IMA programs have become institutionalized over the years and are now routinely implemented year after year by communities, civic groups, schools and local and national governments – both in the Philippines and overseas.

In the Philippines under this project, the IMA Philippines office has continued to implement a program that targets a wide range of destructive fishing practices that compromise coral reefs and livelihoods in the Philippines, including those associated with the Live Reef Food Trade .

Grouper Fisheries and LRFFT monitoring

The monitoring and grouper research on the live reef food fish trade (LRFFT) in the Philippines is crucial because it provides management solutions and determines the impact of the trade on the coral reef ecosystem and associated reef habitat in the context of developing a sustainable fishery. The program focuses on overfishing and habitat destruction through impacts of the LRFFT and cyanide fishing, which is one of the most pressing issues and poses serious implications for coral reef conservation. The impacts of LRFFT were systematically studied in the Calamianes Islands located in Northern Palawan with additional assessments planned for Eastern Samar and Surgiuo.

The program set out to identify scientifically expected indicators for evaluating overfishing and habitat destruction as related to LRFFT. Over-fishing was addressed through indicators such as trends in fish catch, level of fishing effort, estimate of maximum sustainable yield (MSY) from yield-per-recruit analysis, variation in species composition, estimate of fish growth rate, reduction of fish body size,

estimate of mortality rate, and aspects of reproductive biology of the target species. Habitat-destruction was mainly examined by coral bleaching primarily due to cyanide-fishing. Several methodologies were employed to test the indicators of over-fishing, such as fish stock assessment using fishery data in the LRFFT. A visual census on cyanide-impacted and non-impacted areas was also carried out to determine the effect of cyanide-fishing (e.g., coral bleaching).

Major findings by IMA's MIS staff through field assessments, laboratory analysis and life history research were as follows:

- There was a decrease in the catch of live fish in the Calamianes Northern Palawan, especially for the most dominant species, the coral trout, *Plectropomus leopardus*.
- Since its establishment, volume of export of the LRFFT in the Philippines, similarly diminished.
- Series data on catch and fishing effort for the LRFFT was non-existent. A recent estimate of catch per unit effort (CPUE) in the LRFFT was relatively higher compared with values reported for the hook-and-line fishery of *P. leopardus* in the Great Barrier Reef, Australia (also IMA work). This is probably due to increased fishing pressure at unexploited and/or refuge reefs, and fish spawning aggregations sites at the Calamianes. Live fish collectors also travel farther and spent longer periods of time fishing now than in the past.
- *P. leopardus* remained the most dominant species in the LRFFT in the Calamianes since the trade's establishment in the 1980s.
- There was a reduction of mean body size of *P. leopardus* in the Calamianes, which may indicate "increased overfishing", i.e. decreasing body size of groupers able to reproduce.
- The LRFFT targets small - to moderately sized (24.0 - 47.0 cm TL) *P. leopardus* individuals with age range of 2 to 8 years old. The influence of the pricing dynamics on the size (and age) composition of the catch was very pronounced. Based upon previous data, these size and age ranges of the population were reported to be sexually immature and maturing individuals. Thus, high fishing pressure on these size and age ranges may well lead to "recruitment over-fishing"- fishing at intensities high enough that populations cannot recover.
- Preliminary analysis for growth revealed that *P. leopardus* in the LRFFT was slow-growing.



Groupers samples collected in Coron for cyanide testing and then used for fisheries life history research

- Initial estimate of total mortality (Z) for *P. leopardus* in the LRFFT is high. Exploitation rate (E) was also high and exceeded the rate at maximum yield, which implied that present catch levels in the LRFFT are *not sustainable*.
- Although studying the effect of cyanide-fishing on reef habitats proved to be a formidable task, few approaches provided tangible results. An estimate of reef degradation based upon percentage-points loss per year showed that cyanide effect on reef areas in the Calamianes was small. On the other hand, a comparative survey on coral cover revealed higher proportions of dead coral on designated cyanide-impacted than on non-impacted areas. Likewise, live coral cover was greater on non-impacted than on impacted areas. It was, however, difficult to flesh out other factors, which have key roles in habitat destruction such as blast-fishing.



Destruction from blast fishing and cyanide is reducing vaulable fishing habitat in Coron.

The time of spawning aggregations of *P. leopardus* in the Calamines Islands, Palawan has been initially determined and initial discussions about management strategies to protect spawning aggregation sites with local government offices is ongoing.

Initially, consultative meetings with the local government unit (LGU), national government agency (NGA) and the major stakeholders (e.g., fishermen, live fish traders and exporters) in the LRFFT in Calamianes, resulted in awareness of the issues, a level of social acceptability of the issues, and establishment of action plans for the reduction of threats (e.g., over-fishing and cyanide-use). Aside from the fishery control initiatives, one of the proposed actions was to develop participatory style of management that would empower major stakeholders toward sustainable management of the LRFFT.

Consultative workshops to present the results of the Palawan LRFFT assessment were conducted in collaboration with the WWF-Philippines. The results were presented to community stakeholders and government officials and the community recommended incorporating guidelines to reduce over-fishing and the impacts of cyanide into the LRFFT management plan for the Calamianes Islands currently being drafted by the Palawan Council for Sustainable Development (PCSD).

Currently, an assessment of the LRFFT in Eastern Samar is underway. A survey questionnaire has been prepared and includes topics on species composition, catch, estimate of CPUE, fishing area, mean size and size at sexual maturity, market price, spawning periodicity (e.g., spawning aggregations), and habitat degradation due to cyanide use. Other local partners based in Eastern Samar-Guiuan area have been identified in the collaborative work.

Integrated coral farming and giant clam mariculture for rehabilitation and livelihood

During the period of this grant, IMA's coral farm in the Philippines has integrated giant clam mariculture as a means to enhance coral reef productivity and provide alternative livelihoods to local communities engaged in the live reef trade.

IMA-Philippines entered into a Memorandum of Agreement (MOA) with the University of the Philippines-Marine Science Institute, in particular, Dr. Edgardo Gomez, to utilize the Caw-oy Coral Farm as giant clam re-seeding area and a potential source of farmed corals and clams for dissemination to other interested local communities. The local governments of Camotes Island, Masbate City and Isla Verde have signaled their interest in a collaborative partnership for use in their respective locally-managed MPAs.

The coral farm is important for restoration and for training in restoration not only in the Visayas region, but also for the whole of the Philippines. This is helping to bring back coral reefs that have become denuded and destroyed by over fishing and destructive fishing such as cyanide. The corals and clams are available to be planted out by other communities, and as mentioned a proportion of the cultured clams are made available for alternative income purposes, thereby helping to reduce the fishing pressure on surrounding reefs.

IEC and ICC continue

IMA's Coral Reef Education for Students and Teachers (CREST), Information, Education and Communication (IEC) and International Coastal Clean-up (ICC) programs continue to be successful and contribute towards conservation of coral reefs and coastal ecosystems in the Philippines. Many local governments have actively supported the need for clean coasts and oceans through the adoption of local ordinances.

More than 500,000 students have taken part in the CREST program over the last five years and more than 1.5 million in the ICC. Making these programs the largest of their kind in the Philippines and Asia-Pacific region. The IEC and ICC are helping to achieve environmental awareness in the short and long term, especially with young people, which may contribute towards long-term mitigation of threats to coral reefs. This has become a massive task given the population pressures in the Philippines.



In August 2002, a second deployment of 900 giant clams composed of *Tridacna gigas*

The CREST program has been so successful over the years that it has now been endorsed by the Philippine Department of Education, Culture and Sports (DECS) and is now part of the normal curriculum for more than 2,000 schools across the country. Plus it has served as a model, with CREST programs beginning to be implemented in other IMA programs in Vietnam, Fiji, Marshall Islands and PNG.

The annual celebration of the International Coastal Cleanup (ICC) has been institutionalized nationwide whereby the entire month of September has been declared as Cleanup Month every year for the past five years. Many local governments have adopted resolutions or passed ordinances for coastal cleanups in their respective areas.

There were some marked changes from the participation information on the International Coastal Cleanup (ICC) reported from the Philippines in 2001. As of November 30, 2002, IMA reported 80,827 people, 869,102 pounds, and 927 miles. Comparing the 2002 information to 2001's participation information (528,703 volunteers, 4.8 million pounds and 1505.2 miles), there is a dramatic decrease in the number of volunteers, miles and pounds.

This can be attributed to many factors, one being that IMA has cut back on its nationwide staff to run ICC projects and less funds were available this year as in the past to implement this large task nationwide. Plus the number of volunteers reflects the actual number of volunteers who signed in or indicated their names in the Data Cards and Summary Reports submitted to IMA-Philippines. In fact, there should be more but many of our partners did not register nor did they bother to do any paper work. They just came to clean. For example, in Quezon Province, the Philippine Daily Inquirer (Sept. 24, 2002) reported about 25,000 cleanup volunteers. Since there were no data cards nor summaries submitted from this cleanup, they were not included in the total summary submitted to The Ocean Conservancy (TOC). The same is true for Bataan (Region 3), Pangasinan (Region 2), and Calatagan and Anilao in Batangas (Region 4). Some data cards, however, have just been recently submitted to IMA and are now being encoded. Data cards from the Philippines Department of Environment and Natural Resources (DENR)- our lead partner from the national government- have yet to be submitted to us. Data cards from our other partners have also yet to be submitted to us. The decrease in the number of volunteers stems largely from unrecorded participation and from the fact that IMA staff were not able to fully mobilize its partners in the region due to IMA's cash flow problems. For this year's ICC, IMA relied mostly on its government partner to mobilize partners in the region.

The decrease in trash collection can also be attributed to increased awareness and responsibility by the citizenry and its local governments in addressing the problem of solid waste. In January 2001, Philippine President Gloria



The coral farm was featured in Aug 2002 of Focus magazine.

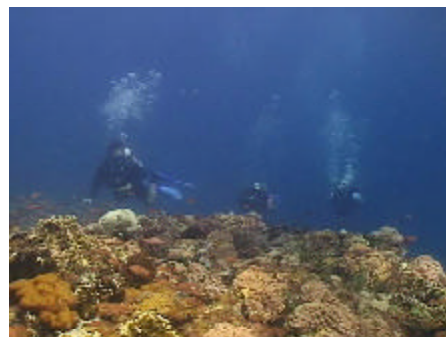
Macapagal-Arroyo passed the Ecological Waste Management Act, which, among others, mandated local government units to promote recycling, re-using and reducing waste.

Fish refuges

IMA has been involved with communities declaring two reefs in Isla Verde, Batangas City (Nalayag Point and Pulong Bato Reefs) as fishery refuges and sanctuaries. Isla Verde Marine Protected Area, Batangas City

In coordination with the Office of the City Veterinarian and Agricultural Services (OCVAS), IMA conducted coral reef resources assessment of four proposed sites for the establishment of a marine protected area. The results of the survey were presented in an island-wide meeting held in San Agustin Kanluran. Based on the survey results, both Nalayag Point and Pulong Bato reefs are in excellent condition with a high abundance and diversity of fishes.

On August 19, 2002, the City Council of Batangas City approved Ordinance No. 13 Series 2002, declaring Pulong Bato in San Agapito and Nalayag Point in San Agustin Kanluran in Isla Verde Batangas City, fishery refuges and sanctuaries. The Ordinance also set forth its utilization, management, protection and conservation.



Underwater assessment work at Nalayag

IMA's CDT/MIS (Cyanide Detection Test, and Monitoring Inspection and Sampling)

The CDT/MIS program has been helping to mitigate destructive fishing (e.g. cyanide use), overfishing and habitat destruction from the aquarium and LRFFT industries in the Philippines. Cyanide bleaches the reef, destroying habitat, and kills non-target organisms, also contributing massively to overfishing since all size classes of fish are destroyed. Cyanide is used in both the live reef food fish and aquarium trades.

The CDT laboratories are now within the employ of the Philippines government although current operations by the Philippine government are not as effective considering that some laboratories are not functioning. During the past year of the project – in which BFAR took over the running of the IMA cyanide labs – concerns have arisen about the continued efficacy of the labs under BFAR direction, requiring IMA to look again at starting its own laboratory to backstop the threat mitigation progress made.

The transfer of the operational management of the (CDT) laboratories to direct BFAR management has left a gap in terms of data collected from the monitoring, inspection and sampling (MIS) activities associated with the laboratories. In fact, the grouper stock assessment study has had no otolith samples collected for 2002 due to the termination of the collaborative monitoring, inspection and sampling (MIS) work with BFAR last year. Otoliths of the live reef food fish, particularly, coral trout *Plectropomus leopardus*, are sectioned to determine age for age-based stock assessment. Not all CDT laboratories turned over to direct BFAR management are in full operation, thereby seriously affecting monitoring of cyanide fishing in these areas.

Finally, it is gratifying for IMA to see that its years of work to train aquarium fishers in cyanide-free techniques has been taken forward under the aegis of the Marine Aquarium Council (MAC), an organization for which IMA was a founding board member and continues to serve on the board. IMA staff member Ferdinand Cruz has been seconded to MAC for 2002, and has been playing a key role in training fishermen and getting the first MAC-certified collection areas up and running. Other former IMA trainers have also been playing key roles in the MAC effort in the Philippines, and the MAC country director is a former long-time IMA staff member, and remains a close colleague. MAC can and should take credit for the work it is doing in the Philippines, but it would not be unfair to say that the many years of work that IMA put into training of aquarium fishermen in sustainable techniques, and training trainers, laid important groundwork for the MAC program as it moves forward.



The Cyanide Detection Laboratories tested over 10,000 samples annually, average of 27 samples per day, and assisted law enforcement agencies in combating cyanide fishing through out the Philippines



Hong Kong Project Objectives:

Continue and intensify the work of IMA-Hong Kong in monitoring the trade in live reef food fish and other reef species (i.e., lobsters, invertebrates, etc.) and expanding the monitoring work to include cities in Southern China.

Create policy mechanisms to encourage a sustainable LRFF trade and an industry Code of Conduct that addresses over-fishing and destructive fishing and the sustainable management of the fishery.

IMA's Hong Kong program is a cross-cutting program that works at a regional level, with a focus on monitoring and transforming the "demand side" of the LRFFT that exists in many of the other countries where IMA works. The primary functions of the Hong Kong program are to (a) gather and disseminate information on the LRFFT market, and (b) work with industry, governments, and other stakeholders to develop and implement better LRFFT capture and culture practices in source countries. The Hong Kong program remains the only initiative that systematically gathers data on the trade and provides it to interested stakeholders. It is also the only organization that has gained the trust and cooperation of key industry players in Hong Kong.

Thus, to the extent that accurate market information and engagement with the industry are prerequisites for reforming the LRFFT in source countries (and IMA strongly believes that this is the case) – and to the extent that the trade, as currently practiced, is a major threat to coral reef ecosystems (a widely accepted fact) – IMA believes that its Hong Kong Program is making a direct, important, and cost-effective contribution to coral reef conservation.

Indeed, IMA's Pacific Program points out in this report how valuable the Hong Kong data has been to places like Fiji, and how the data is currently helping to show a downward production trend in fish coming from the Pacific at a time when IMA's efforts in these countries are starting to bear fruit and bringing some protection against unmanaged LRFFT exploitation.

This grant has also helped maintain a fully functional and forward-looking trade monitoring office in Hong Kong, whose staff continue their duties under IMA's coordination. A valuable data set has been put in place for fisheries management in the Indo Pacific, with the utility of this data set growing as additional years of data get added on, helping to show trends.

Monitoring the Live Reef Food Fish Trade (LRFFT) in Hong Kong and Southern China

IMA's two-person Hong Kong office has continued to systematically collect information on LRFFT import volumes, countries of origin, and wholesale and retail prices during 2002. Data on import volumes and countries of origin are regularly collected from the relevant government



Aberdeen wholesale market

agencies and the Hong Kong Chamber of Seafood Merchants (HKCSM), analyzed and put into easily-understandable spreadsheets for dissemination.

Retail price information is gathered by monthly survey visits to 140 of Hong Kong's 730 Chinese seafood restaurants, while wholesale prices are gathered three times per month from the HKCSM, local wholesale markets and visits to the facilities of local wholesalers and distributors. All of this information is compiled on a monthly basis and provided to IMA field offices, other organizations, universities, and local and overseas government departments.

In response to the increasing percentage of fish being re-exported from Hong Kong into mainland China, IMA also began gathering monthly price surveys in January 2002 in Shenzhen and Guangzhou, albeit on a smaller scale: retail prices are sampled from 10 restaurants in each city, while wholesale prices are sampled from the major wholesale live fish markets in each city. The information gathered by IMA on the LRFFT in Hong Kong and neighboring cities of southern China is the only regular and accessible source of this information.

Currently, an analysis of three years of pricing data is underway, with comparisons being made to a series of local and regional economic indicators. The preliminary outcomes of the analysis are encouraging, also verifying that the data collection carried out in Hong Kong is of great importance to other programs. This data is to be written up in a formal paper and submitted for publication to environmental economics journals.

Developing Industry Best Practice Standards for the Live Reef Food Fish Trade to help curb destructive practices

The Hong Kong office has also been very active in developing best practice standards for the LRFFT. Since the need for development of industry best practice standards for the trade was identified as a priority at a February 2001 workshop in Honolulu (jointly sponsored by IMA, WRI,

The Nature Conservancy (TNC), and the MacArthur Foundation), IMA has entered into a partnership with TNC and the Marine Aquarium Council (MAC) to carry this initiative forward, with the Hong Kong Program taking the lead for IMA. A joint two-year workplan was agreed upon by the three organizations in January 2002, and is currently being implemented.

IMA's activities in this partnership have included:

- organizing and co-hosting a three-day workshop (Townsville, August 2002) on LRFFT assessment and monitoring methodologies (the report of which is expected to be disseminated in early 2003);
- co-hosting a major Pacific regional meeting on the live reef fish trade (Suva, September, 2002) at which the results of the Townsville workshop were presented and discussed;
- co-hosting a regional workshop on Sustainable Marine Finfish Aquaculture for the Asia-Pacific (Halong City, October, 2002) to develop standards for the aquaculture industry;
- completion of a major study on the LRFFT on Australia's Great Barrier Reef (to be published by IMA and the CRC Reef Research Centre at James Cook University in early 2003);
- and ongoing participation in the process, led by MAC, of developing the first draft of industry standards (currently undergoing expert review and comment.)

A major contribution of IMA to this process has been IMA's ability to get Hong Kong LRFFT traders to participate. At the outset, the industry expressed deep suspicions about the motives and plans of both MAC and TNC, and it was only through IMA's intervention, based on IMA's long relationship with key industry players, that industry representatives agreed to participate in the process.



IMA staff collecting data in Guangzhou market in mainland China

IMA's collaboration with MAC on this issue has also strengthened MAC's knowledge base and experience with the LRFFT, which was a completely new area for that organization when the project started.

Engaging in policy dialogue at the regional and international level

IMA has also been a key link between this project and the APEC Fisheries Working Group, participating in a March 2002 APEC technical workshop (Brisbane), and serving on the U.S. Delegation to the APEC Oceans Ministerial Meeting in April 2002 (Seoul) and the Fisheries Working Group meeting in May 2002 (Lima). IMA was asked to participate in APEC given our expertise in this regional fishery centered around Hong Kong and SE Asia. The institutionalization of LRFFT is a priority for the APEC Fisheries Working Group.

Destructive fishing reduced in the Pacific

The IMA Hong Kong program can certainly take some credit for slowing down the expansion of the LRFFT into the Pacific. Provision of accurate price information to source countries is in part responsible for this, since source country stakeholders tend to drive harder bargains with potential buyers when they know the true wholesale and retail prices paid in Hong Kong. Details of the market dynamics, modes of transportation and financial investments needed have also been provided to Pacific countries, allowing them to determine whether a LRFFT fishery is even viable in their region. In addition, the Program regularly responds to requests for information about specific companies from source-country governments.

While IMA is not in the business of "certifying" buyers, or passing judgments on whether a particular operator is "good" or "bad," the provision of objective factual information on a company's record in other countries often has the same effect.

The data trends from Hong Kong – especially volume data for source countries - have also helped IMA's country offices in the Pacific and their partners prioritize and plan their field strategies accordingly.

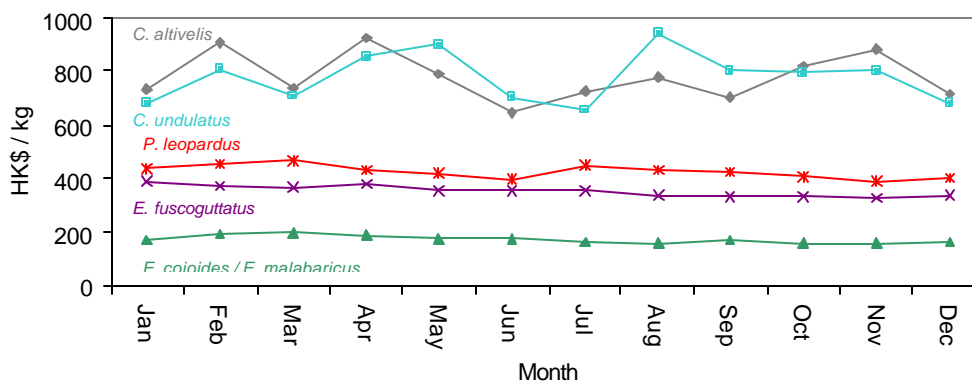
Looking into the future, the development of widely-accepted best practice standards for the industry is a necessary prerequisite for improving practices in source countries, and to the extent that implementation of these standards gain support from the industry, governments – and, importantly, donors, who will be needed to fund pilot efforts to implement the standards – the standards will be an important tool for reducing threats to reefs caused by the LRFFT as it is currently practiced.

Table 1: Total volume (kg) of the live reef food fish imported into Hong Kong in 2001 and 2002 (until November)

Species	2001			2002 (Jan - Nov)		
	CSD	AFCD	Grand Total	CSD	AFCD	Grand Total
	kg	kg	kg	kg	kg	kg
Giant grouper	2,687	24,918	27,605	3,543	1,089	4,632
High-finned grouper	7,753	10,383	18,136	10,550	968	11,518
Green grouper	1,466,075	294,150	1,760,225	1,061,454	8,931	1,070,385
Tiger grouper	95,230	248,180	343,410	117,597	16,068	133,665
Flowery grouper	159,402	158,255	317,657	130,918	11,592	142,510
Leopard coral trout	1,990,853	305,000	2,295,853	2,006,046	10,866	2,016,912
Spotted coral trout	109,653	152,138	261,791	86,079	11,350	97,429
Other groupers	1,966,600	324,153	2,290,753	1,404,221	16,370	1,420,591
Humphead wrasse	12,291	24,662	36,953	24,331	1,452	25,783
Other wrasses & parrotfish	4,500	65,988	70,488	-	1,210	1,210
Snooks & basses	1,749,513	--	1,749,513	1,139,176	-	1,139,176
Mangrove snapper	456,542	38,296	494,838	221,533	1,814	223,347
Other marine fish	3,692,977	473,978	4,166,955	4,082,333	2,843	4,085,176
TOTAL	11,714,076	2,120,101	13,834,177	10,287,781	84,553	10,372,334

Table 2: Monthly volume (kg) of live reef food fish imported into Hong Kong from January to September 2002, with country of origin listed.

Country	Total (kg)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mainland China	2,458,017	276,200	262,573	260,592	296,367	285,799	222,547	271,593	305,535	276,811
Thailand	2,036,175	175,541	341,326	206,436	123,850	205,972	180,045	206,516	244,006	352,483
Philippines	1,043,829	114,206	117,701	107,660	92,322	99,281	89,945	98,386	159,154	165,174
Australia	1,026,847	114,440	158,895	85,715	84,396	120,022	93,573	106,484	136,439	126,883
Indonesia	905,186	113,372	107,504	143,214	124,221	107,043	79,606	84,407	67,617	78,202
Malaysia	369,516	35,534	50,624	35,749	44,016	63,483	24,584	34,108	41,384	40,034
Vietnam	114,195	20,084	18,032	15,654	13,027	10,272	7,541	10,211	10,913	8,461
Taiwan	96,062	16,185	26,551	19,054	6,985	8,454	5,457	3,291	9,868	217
Japan	52,425	4,127	4,095	4,995	5,098	6,464	6,192	7,212	7,120	7,122
France	39,786	2,050	5,170	5,558	10,096	7,968	1,080	2,736	2,120	3,008
Maldives R	38,000	-	-	-	-	-	20,000	-	18,000	-
Marshall Islands	36,676	-	-	-	12,080	-	7,000	4,335	2,000	11,261
Cambodia	30,722	2,872	6,078	4,450	5,881	1,782	4,161	1,618	1,618	2,262
Singapore R	6,085	1,195	1,929	441	819	1,131	-	-	466	104
Myanmar	1,355	992	317	-	-	-	12	-	-	34
Papue New Guinea	1,240	170	750	270	50	-	-	-	-	-
Hong Kong SAR	1,176	-	-	-	245	-	-	-	931	-
USA	1,095	-	400	460	135	-	-	-	-	100
Brunei	820	275	-	-	-	310	-	-	-	235
India	550	-	-	-	-	-	-	-	550	-
Mexico	420	-	-	-	-	420	-	-	-	-
United Kingdom	368	-	-	-	-	368	-	-	-	-
Namibia	251	-	-	-	-	-	-	-	-	251
Chile	106	106	-	-	-	-	-	-	-	-
Total (kg)	8,260,902	877,349	1,101,945	890,248	819,588	918,769	741,743	830,897	1,007,721	1,072,642

Figure 2 Monthly variations in retail prices (HK\$ / kg) of 5 fish species in 2002 (Hong Kong)


Note: US\$ 1 = HK\$ 7.8