



Recent developments in combating cyanide fishing: Much talk but little action on the ground

by Charles Barber¹

It has been at least three years since the live reef fish trade (LRFT) and its widespread use of cyanide began to receive extensive media attention. Since that time it has been discussed at a host of international meetings and become a legitimate funding priority for a number of bilateral, multilateral, and private funding agencies. But much of the media-generated buzz has died down since 1997, and there seems to be a growing public belief that the 'experts' are handling the problem. How could they not be handling it, after it had been on CNN and in *Time* magazine? Haven't major donors committed themselves to solving the problem? Haven't major environmental groups launched initiatives to deal with it?

The situation is reminiscent of the great flurry of concern in the U.S. and Europe about the Amazon rainforests in the late 1980s. Cover stories, TV documentaries, petitions on the counter at the Body Shop, rock star benefits and a slew of other factors led to a 'Save-the-Amazon' boomlet, even the creation of a special international fund. By the mid-1990s, however, the celebrities moved on to other causes and the media followed them. Ordinary Americans and Europeans were by then surprised to hear that the Amazon was still being hacked and burned even faster than in the late-1980s. 'Didn't Sting fix that?'

The LRFT has not yet been subject to this ultimately counterproductive boom-and-bust cycle, and no celebrity the likes of Sting has emerged as the champion of the Napoleon wrasse. But the dialogue about the LRFT has been characterised by the emergence of a series of partial quick-fix solutions, including grouper aquaculture, certification of live reef fish imports in consumer countries, and attempts to develop a test for the presence of cyanide in fish, simpler than the methods currently available. These are all parts of the solution, but miss some of the main elements discussed below.

More worrisome is the apparent belief by some that a little publicity by itself will make the prob-

lem go away. A recent edition of *Asian Divers* 'Ecowatch' feature, for example, announced that 'the Toloka Foundation has managed to stop the live reef fish trade in the Togian Islands, off Sulawesi' in Indonesia. Indeed, on its website, the Toloka Foundation announced in September 1998 that 'since publicising the live reef fish trade in the magazine *Asian Diver*, Toloka have successfully raised this issue with the Indonesian authorities and this activity seems to have ceased altogether in the Togian Islands.'²

Unfortunately, nothing could be farther from the truth. A team of experienced investigators from the International Marinelife Alliance (IMA) carried out an assessment of the live reef fish trade in early September 1998—the very month in which Toloka was proclaiming victory—and found a pervasive and widespread live reef fish trade in which cyanide was being widely used.³ A follow-up IMA team is currently in the field working with local government agencies to develop and implement a programme to train cyanide fishermen in cyanide-free capture techniques, and the government is considering a ban on live fish exports from all operators whose fishermen have not undergone training.

Cooperation and hard work 'based on a realistic assessment of the problem' can reduce the use of cyanide and other destructive effects of an unregulated LRFT in the Togians and elsewhere, but declaring premature victory in the face of a real-life situation to the contrary solves nothing, and discourages donors and other partners from addressing the problem.

Concerted and comprehensive action can reduce cyanide fishing in places where it is already well established, and prevent it in places where the LRFT is just getting started. Furthermore, working with government agencies and NGOs on this issue provides a strategic entry point for addressing broader concerns about the sustainability of the LRFT, and other coral reef threats such as blast fish-

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2. Campaign to Halt the Live Reef Fish Trade. STOP PRESS September 98..., VICTORY FOR TOLOKA, <<http://members.aol.com/toglovers/campaign.htm>> downloaded 29 October 1998.
3. Cruz, F. (1998). Assessment of the Live Reef Fish Trade in the Togian Islands, Southeast Sulawesi Province, Indonesia. Manila: International Marinelife Alliance. October, 1998.

ing and the over-harvest of reef invertebrates and other reef organisms.

This article discusses the Indo-Pacific Destructive Fishing Reform Initiative, launched by IMA and the World Resources Institute (WRI) in early 1998. The article's purpose is to seek the comments and collaboration of the many groups and individuals working to ensure that the incomparable coral reefs of the Indo-Pacific, the 'Amazon of the Oceans' survive and prosper well into the coming millennium.

A model for regional action: The Philippines Destructive Fishing Reform Program

The Philippines, 'birthplace of cyanide fishing', is also the birthplace of an effective strategy for combating the spread of the practice and establishing sustainable live reef fisheries. The Philippines' experience serves as the model for the Indo-Pacific Destructive Fishing Reform Initiative discussed in the next section, and is therefore worth reviewing briefly, although it has been discussed in detail elsewhere.⁴

Beginning in the late 1980s, IMA—the NGO that had first exposed cyanide fishing through an international publicity campaign earlier in the decade—began working with the government's Bureau of Fisheries and Aquatic Resources (BFAR) to develop a strategy to combat cyanide fishing and other forms of destructive fishing. This has evolved into a durable partnership between IMA, BFAR, and numerous local communities and local government units around the country, as well as donors including USAID and the Asian Development Bank. Elements include:

- Cyanide Detection Test (CDT) laboratories at six key locations around the country to test samples from export shipments and either certify or seize them, backed up by additional Monitoring and Inspection Stations (MIS), all operated by IMA under contract to the government;
- Training programmes to convert fishermen (some 2000 so far) to cyanide-free capture techniques, help them obtain a better price for their catch, and assist them in developing other livelihood enhancement activities;
- Development of new government policies and procedures to more effectively regulate the live

reef fish trade and the distribution and use of cyanide;

- Intensive public awareness campaigns with the media and in the educational system to promote marine conservation and raise awareness of the effects of cyanide fishing, explosive fishing, and other destructive practices;
- Collaboration with environmentally concerned live fish importers in the USA (through the Marine Aquarium Council, a newly established certification body, see Holthus, page 34, this issue) and in Hong Kong, to build consumer and importer support for a more sustainable live reef fish trade.

While the primary focus of the Philippines' programme has been on eradicating the use of cyanide in the live reef fish trade, the strategies employed have also proven helpful in converting fishermen from other destructive reef fishing practices such as the use of explosives and harvest of sea turtles.

In 1997, IMA and the World Resources Institute (WRI) together published and widely distributed '*Sullied Seas: Strategies for Combating Cyanide Fishing in Southeast Asia and Beyond*'. This report highlighted the threat and spread of cyanide fishing, analysed the Philippines' response, and set out recommendations for action in neighbouring countries.

The response to *Sullied Seas* from government agencies and non-governmental organisations (NGOs) in the region was immediate and very clear: 'We have a large (or rapidly expanding) live reef fish trade and we suspect (or in some cases, are certain) that the operators are using cyanide. We have read your report. Please come and help us!'

The Indo-Pacific Destructive Fishing Reform Initiative (DRFI)

In early 1998, in response to these numerous requests for advice and assistance, IMA and WRI launched the Indo-Pacific Destructive Fishing Reform Initiative (DRFI), a five-year campaign designed to ensure that the last, best reefs of the Indo-Pacific region do not fall prey to the destruction that the cyanide-based live reef fishery has already brought to many areas of the Philippines and Indonesia. The objectives of the DRFI are:

- Consolidate, expand, and further institutionalise the gains in combating cyanide fishing and pro-

4. For detailed analysis of the Philippines' Destructive Fishing Reform Program, see C.V. Barber and V.R. Pratt, '*Sullied Seas: Strategies for Combating Cyanide Fishing in Southeast Asia and Beyond*' (WRI and IMA); and C.V. Barber and V.R. Pratt, 'Policy Reform and Community-Based Programs to Combat Cyanide Fishing in the Asia-Pacific Region' in M.E. Hatzioles, A.J. Hooten, and M. Fodor, eds., *Coral Reefs: Challenges and Opportunities for Sustainable Management*, Washington DC. World Bank, 1998.

moting sustainable coral reef management already made in the Philippines over the last decade under the joint government-IMA Destructive Fishing Reform Program;

- Conduct systematic assessments of the status of live reef fisheries and associated threats to coral reefs—and related policy, legal, economic, and institutional issues—in eastern Indonesia, Papua New Guinea, Sabah (Malaysia), Thailand, the Solomon Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Kiribati, the Andaman and Nicobar Islands (India), and selected countries of the western Indian Ocean.
- Work with the governments of the target countries to develop Action Plans to combat destructive fishing practices and build local capacity for coral reef conservation and sustainable live reef fisheries management;
- Work with buyers of live reef fish in major markets (the United States, Europe, Hong Kong) to establish market standards and practices that discourage destructive reef fishing practices and provide market incentives for sustainable uses of reef fish and other resources;
- Conduct strategically targeted scientific research to fill existing gaps in knowledge about the biology and behaviour of the grouper species that are the prime target of the live reef food fish trade—information needed to provide a sounder scientific basis for policy and fisheries management decisions;
- Systematically document and publish the findings and recommendations from all work carried out under the project in order to evaluate its impact, influence policymakers, and inform the general public.

The work in each country will necessarily vary with the nature of the local LRFT and the cultural, institutional, and policy conditions. In broad outline, however, each local programme will include similar elements, as follows:

Field and Policy-Institutional Assessments in Target Countries.

Teams assembled by IMA and WRI have already undertaken field assessments of the live reef fish trade in four areas of eastern Indonesia⁵; Kiribati⁶; Papua New Guinea⁷; and India's Andaman Islands⁸. Preliminary assessments have also been carried out in Sabah (a key live-fish trans-shipment point for the Philippines and Indonesia) and the Marshall Islands. In the first part of 1999, assessment teams are also being sent to the Solomon Islands, the Federated States of Micronesia (FSM), and countries of the western Indian Ocean, and more extensive follow-up assessments in some of the countries will be carried out, particularly with respect to policy, legal, and institutional issues.

These assessments are undertaken in collaboration with relevant government agencies in each country. Other collaborators have included the World Wide Fund for Nature (WWF) Indonesia Program, The Nature Conservancy (in the Pacific and Indonesia), Conservation International (in Papua New Guinea), and a variety of local NGOs, especially in eastern Indonesia.

Results of the field and policy assessments will form the basis for dialogue with government agencies and other actors, leading to agreement on live reef fish trade national action plans to be carried out under the initiative by key government agencies in collaboration with IMA, WRI, and a variety of NGOs and other technical and policy specialists.

Monitoring, Inspection and Sampling (MIS)

Government fisheries agencies cannot hope to regulate the LRFT without adequate capacities to monitor the trade, inspect facilities and vessels, and systematically sample the catch for cyanide testing and other purposes. The DFRI therefore stresses training for local Fishery agents in the monitoring and inspection of fish shipments, and in the collection of statistical data on exports and volumes of live fish passing through the markets, airports and piers.

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5. C.V. Barber & F.P. Cruz, "Turning the Poison Tide: The International Marinelife Alliance's Cyanide Fishing Reform Program in Indonesia," SPC Live Reef Fish Information Bulletin No. 4, April 1998 (discusses results of an assessment in North Sulawesi); F. Cruz, Assessment of the Live Reef Fish Trade in the Kei Islands, Maluku Province, Indonesia. Manila: International Marinelife Alliance. September, 1998; Ferdinand Cruz, Assessment of the Live Reef Fish Trade in the Togian Islands, Southeast Sulawesi Province, Indonesia. Manila: International Marinelife Alliance. October, 1998. (The report of an assessment in the Luang island area of southwest Maluku Province, carried out in collaboration with Telapak Indonesia, an Indonesian NGO, is forthcoming.)
 6. G. Reyes, Rapid Assessment of the Live Reef Fish Trade in Kiribati. Manila: International Marinelife Alliance. May, 1998.
 7. F. Cruz and B. McCullough, The Live Reef Fish Trade in Milne Bay Province, Papua New Guinea: Field Assessment Report. Manila: International Marinelife Alliance. May, 1998.
 8. G. Reyes, Assessment of the Live Reef Fish Trade in the Andaman and Nicobar Islands, India. Manila: International Marinelife Alliance. September, 1998.

Cyanide Detection Testing (CDT)

Cyanide Detection Testing (CDT) is not a panacea, but it is the best technical tool currently available to identify cyanide-tainted fish and provide hard evidence with which to prosecute violators. Countries that are serious about stopping cyanide fishing must be serious about developing their capacities to systematically test live fish intended for export. To that end, the DFRI will provide technical assistance to target countries that want to establish their own CDT laboratories.

Until such time when target countries can establish their own labs—or in countries where it makes more sense to contract out this function, such as some small island nations—samples will be sent for testing at the CDT laboratories in the Philippines, as is already being done with fish from Indonesia and as will be done in early 1999 with fish from the Marshall Islands and Kiribati.

Information, Education and Communication (IEC) campaign

Public awareness and education in the schools are key tools in mobilising public opinion against destructive fishing practices. To that end, the DFRI will assist the target host governments in developing information, education and communication (IEC) campaigns to increase the level of people's awareness on the diversity and wealth of their marine resources and to alert the people to the problems of destructive fishing. Building on IMA's extensive programmes with the Philippine public school system, the DFRI will also work with local Education Departments to develop curriculum-enhancement programmes.

Skills Training Programme (STP)

When fishermen are presented with effective cyanide-free technologies for capturing live food and aquarium fish—and given greater awareness about the legal, health, and ecological risks of cyanide fishing—many choose to convert to cyanide-free techniques. Skills training in barrier-net collection (for aquarium fish) and hook-and-line decompression collection (for live food fish) thus lies at the core of an effective strategy for reducing cyanide fishing.

The DFRI therefore places particular importance on developing such programmes with host governments and NGOs in target countries. In addition, training is often needed in post-harvest handling of fish to reduce mortality. In the Andaman Islands, for example, cyanide use is unknown but mortality rates are extremely high due to poor fish handling techniques.

Community Enterprise Development (CED)

Once a community is using cyanide-free capture techniques and capable of good post-harvest handling, it needs assistance in linking with buyers willing to pay a premium for high-quality live fish caught in environmentally sustainable ways. The DFRI will therefore assist such communities with marketing matters, to ensure that their fishery is profitable as well as environmentally sustainable, and has already done so in North Sulawesi, Indonesia, as well as throughout the Philippines.

Grouper aggregation, aging, and breeding

Scientific knowledge about grouper biology and behaviour is inadequate for effective management. To help remedy this gap, the DFRI will both strengthen IMA's ongoing research on grouper aging and breeding in the Philippines, and help partner government agencies and local universities to build their own capacity in this regard, particularly with respect to better understanding local group aggregation behaviour and identifying aggregation sites.

Policy reform and institutional capacity building

This will involve policymakers and government fisheries management agencies in target countries. Parallel with the programme elements noted above, the DFRI will work with senior policymakers, government fisheries and marine conservation agencies, and other stakeholders to define and implement the policy reforms and institutional strengthening measures necessary to effectively implement all other elements of the programme. The Initiative will also work with governments to act as a catalyst for attracting bilateral and multilateral Official Development Assistance to countries for these purposes.

Moving live fish markets towards sustainability

Incentives for LRFT source countries to move their live reef fisheries toward sustainability will be considerably bolstered if importers and consumers in importing countries require that live reef fish come only from cyanide-free and otherwise environmentally friendly sources. To that end, the DFRI is working with the Marine Aquarium Council (MAC) in the United States—a new consortium of live reef fish importers and NGOs working towards a certification system for aquarium fish imports in the United States (see article by Holthus on MAC in this issue)—and the Chamber of Seafood Importers—a new body with the potential to perform the same function for live food fish imports into Hong Kong—to establish market incentives for both importers and exporters to take

steps necessary to ensure a transformation to a sustainable, cyanide-free live reef fish trade.

Indeed, without a great deal of work such as that being carried out under the DFRI, there will be no Indo-Pacific reef fish on the market able to be certified as cyanide-free and otherwise sustainably caught and handled.

Documentation and evaluation

Finally, IMA and WRI believe it is important that experiences from the field, both good and bad, need to be widely shared and evaluated. To that end, the DFRI places strong emphasis on documenting its work and resulting data and lessons learned into high quality, readable publications and other media for wide dissemination to policymakers, fisheries and marine conservation managers, donor agencies, NGOs, and the general public.

Conclusions and a request for feedback and partnership

WRI and IMA are well aware that this ambitious initiative is well beyond the scope of our two organisations working on our own. As a result, the DFRI will only work in countries and communities where there is strong support from local government units, fisheries agencies, local and national NGOs, and the communities where field activities are carried out. And we are already working with, or in the process of developing relationships with, a range of international institutions, including the

World Bank, Asian Development Bank, U.S. Agency for International Development, The Nature Conservancy, the World Wide Fund for Nature (WWF), and Conservation International.

While we are convinced that the DFRI's approach is essentially sound, doubtless there are many improvements and refinements that could be made. We therefore urge readers to send us comments and recommendations and, above all, we invite collaboration with any and all organisations that share our commitment to conserving the reefs of the Indo-Pacific into the next millennium.

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Notes on reproduction in the estuarine stonefish *Synanceia horrida*

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The estuarine stonefish, *Synanceia horrida* is a benthic ambush predator with a distribution ranging from India to Australia and north to China (Randall, Allen & Steene, 1990). The species typically inhabits coastal foreshores, in waters that are subject to salinity fluctuations and often carry a high sediment load (Grant, 1987). These conditions provide a muddy substrate, which the estuarine stonefish use to camouflage themselves from predators and potential prey by burying themselves in the silt or sand, with only their mouth slit protruding (Grant, 1987). We observe that these fish can be tracked from one sunken ambush site to another by following impressions left in the mud by the fish hopping across the bottom on its pectoral fins

Stonefish are an important fisheries resource in the live fish trade. After capture, the fish are maintained alive, then transported, usually by air, to Hong Kong where they are considered a delicacy. (Fifteen-inch Stonefish, *Synanceia verucosa*, averaging about 38 cm in length, were selling live for \$US 34.10 per kg live weight in the Hong Kong market in February 1999 (Y. Sadovy, pers. comm.)).

To date, stonefish have been collected from several sources, including the Philippines, Indonesia and Papua New Guinea. Stonefish stocks have been recorded as fished out of prime areas in Papua New Guinea, where previously large numbers were collected for anti-venom production (Brown

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