

Group (SAG) review process. During various consultation opportunities, the key partners group has been seeking and receiving support in the development of SAG from important stakeholders from government, industry, and NGOs. The project will conduct field tests to analyse the technical and economic feasibility of standards implementation in 2003. If the project proceeds according to plans, by the end of the year the standards will be finalised, along with supporting guidance documents to help implement them.

Of course, the real work of implementation will begin once the standards are disseminated and broadly adopted by relevant stakeholders. If LRFFT industry standards are to be more than a piece of paper, commitments from industry, donors, government agencies, technical experts, and marine conservation NGOs will be required to actually implement the best practices embodied in the standards.

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## A workshop to develop standards for the assessment, monitoring and management of the live food fish trade

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Of the range of models used to achieve collaborative management of resources, voluntary codes of conduct and industry standards have been proposed as being more suitable for promoting practices that ensure effective conservation, management and development of resources with due respect for ecosystems and biodiversity. Many guiding principles of such codes (e.g. FAO Code of Conduct for Responsible Fisheries) recognise a sustainable fishery should be based upon:

1. assessment, maintenance and reestablishment of healthy populations of target species and ecosystem integrity;
2. the development and maintenance of effective fisheries management systems taking into account biological, socioeconomic and environmental aspects; and
3. compliance with national/local laws and standards and international understandings or agreements.

The recognition of the need for a broad-based set of industry "best practices standards" for the global live reef food fish trade (LRFFT) emerged from the *Collaborative Strategy to Address the Live Reef Food Fish Trade* workshop held in Honolulu in 2001.<sup>2</sup> A commitment to more sustainable fisheries outcomes in the Indo-West Pacific and Southeast Asia was reflected in the endorsement by those present to developing industry-wide standards to reduce the threats posed by unchecked expansion of the LRFFT.

As part of the LRFFT Industry Standards Development project being undertaken by the Marine Aquarium Council (MAC), International Marinelife Alliance (IMA) and The Nature Conservancy (TNC) (see story by Kusumaatmadja et al. in this issue), a three-day workshop was convened in Townsville, Australia, in August 2002.

The focus of the workshop was on developing practical standards to guide regional and national management agencies in producer countries in the development of sustainable management of their wild-harvest live reef food fish fisheries.

The main objectives of the workshop, convened by IMA (Australia) with technical assistance from MAC, were to:

1. summarise the main fisheries dependent and independent methods to collect and analyse data in tropical coral reef fisheries;
2. prescribe the application of these techniques to the LRFFT with emphasis on assessing initial fishery viability and the ongoing assessment and monitoring programs required to sanction or approve expansion of a fishery;
3. identify the management tools and strategies most appropriate for the LRFFT given capacity constraints; and
4. identify responsible practices of fishing operations in terms of capture and post-harvest handling and consumer safety.

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2. See Section 3.2, Graham, T. 2001. *A Collaborative Strategy to Address the Live Reef Food Fish Trade*. Asia Pacific Coastal Marine Program, Report # 0101, The Nature Conservancy, Honolulu, HI, USA.

The workshop was organised such that each of these objectives was captured under one of four themes. An additional theme, “Identifying actors and building capacity,” was included to address key issues in relation to the realising these standards.

While this was primarily a technical workshop, participants comprised representatives from industry, government, the scientific community and marine conservation organisations from Australia, the Pacific and throughout Southeast Asia. By providing a forum for multi-stakeholder discussions, the workshop was able to build consensus on what “best practices” were needed to move the industry toward increased responsibility in terms of sustainable reefs, fish stocks and fishing communities.

Day one of the workshop focused on the main fishery dependent and independent methods for collecting data to assess and monitor the fishery status and their application to the LRFFT. The unique aspects of the LRFFT (spatial remoteness of collection areas and limited human, financial and institutional capacity) were identified as obstacles to collecting useable fisheries dependent data (catch and effort records) from fishers, middlemen and exporters. However, there are potential intervention points along the chain of custody where monitoring may be more effective, such as at the buyer or exporter level.

With the expansion of the LRFFT into new areas or countries often occurring rapidly, there was consensus that fishery independent methods such as underwater visual surveys (UVS) represented the most effective means by which to establish the potential for a LRFF fishery. UVS guidelines were established with respect to the techniques (e.g. belt transect, stationary counts, intensive searches) most suited for individual species targeted by the trade, mindful of their life history characteristics that require special consideration.

While recognising the superiority of UVS in initially assessing fishery viability, participants agreed that its limitations in estimating abundance, density and harvest limits meant reliance on UVS alone was inappropriate. Ongoing assessment and monitoring will need to utilise fishery dependent and independent techniques simultaneously. This calls for improved capacity of management agencies to collect catch and effort data from fishery participants, which will in turn require stronger collaborations between these agencies and non-governmental organisations (NGOs) to enhance that capacity.

While cognisant of the sovereignty of countries to exploit their marine resources for the LRFFT, participants emphasised that decisions to sanction or

expand a LRFF fishery must rely on good scientific information, particularly biological parameters such as growth and mortality rates, size at recruitment to the fishery and size at maturation.

## Fishery instatement and development

The meeting proposed the use of “Rough Rules of Thumb (RROT) for the Instatement and Development of a LRFF Fishery.” These RROT, aimed at nations with limited fisheries assessment, management and monitoring capacity, recognised that acquiring site and species-specific scientific data to guide harvest limits will take a number of years. These RROT suggested precautionary guidelines for developing a LRFF fishery, including:

- the use of trial fisheries;
- minimum data requirements and techniques for collecting that data;
- collection of data from fishers engaged in artisanal fisheries and the LRFF fishery;
- limiting harvests to more productive species (e.g. *Epinephelus fuscoguttatus*, *E. polyphkadian* and *Plectropomus* spp.);
- bans on harvests of long-lived, threatened or ecologically important species and species economically important to non-fishing industries (e.g. dive tourism);
- setting initial harvest limits based on UVS estimates of standing stocks and known natural mortality rates;
- recognition and incorporation of existing customary marine tenure arrangements;
- closure of a minimum percentage of available reef area to exploitation for the LRFFT;
- prohibiting exploitation of spawning aggregations, such as through the use of seasonal closures; and
- undertaking a community cost-benefit analysis for all developing LRFF fisheries.

## Fisheries management

The geographical, economic and political remoteness of many tropical small-scale fisheries and the lack of monitoring and enforcement capacity of governments means many conventional regulatory tools may not be suitable for the LRFFT, or may need to be adapted to achieve desired outcomes. With this in mind, on day two, workshop participants were asked to review a range of regulatory tools and practical management measures in terms of:

1. key factors for and impediments to their success;
2. the merits and shortcomings of each tool and preferred situation for their use; and
3. where along the “chain of custody” management intervention should be targeted.

Given the limitations described above, the use of input controls (licensing, effort controls, and seasonal closures) and zoning (spatial closures) were preferred to output controls (harvest limits and quotas) for managing the tropical inshore fisheries that usually support a LRFFT. Attaining long-term benefit from a LRFF fishery will require strict management and enforcement to alleviate potential negative environmental and social impacts. Ideally the management system should:

- adopt a precautionary approach in the presence of scientific uncertainty;
- quantitatively assess those resources to be targeted in advance of the onset of LRFF operations;
- require periodic assessments of fishing impacts on the biological status of the resource;
- achieve sustainable fisheries by protecting the ecological systems that support them;
- take account of current and historical demands from subsistence or local commercial fishing; and
- support and rely on the legal and customary rights of people dependent on fishing for a livelihood.

A fisheries management system for existing and proposed LRFF fisheries could be prescribed in the form of a fishery management plan, which was seen as requiring the inclusion of the following principal elements:

- **Licensing**
  - limits on number of licences, operation size and/or the size of holding pen for buyers and exporters;
  - separate licensing of locally owned fishing vessels and operators (buyers/exporters);
  - licence conditions to designate: fishing area, period for which licence valid, percentage of local ownership, crewing arrangements between operator and local fishers and recording and reporting requirements of licensee;
  - levying of licence or access fees to cover a percentage of monitoring and enforcement costs; and
  - access agreements between resource owners and fishing operator prior to granting licence.
- **Monitoring and enforcement**
  - data recorded at species level for live and dead product and bycatch species at all levels (fishers, middlemen and overseas buyers);
  - exports permitted only from designated airports or ports to facilitate monitoring of exports;
  - onboard fishery observers during both fish-

- ing and loading/unloading activities;
- ban transshipments at sea and away from central collection areas;
- recognise relevant community, provincial, state, national and international laws governing enforcement;
- use traditional mechanisms of marine tenure and resource control to strengthen enforcement;
- impose levies, fines or seizure of cargo for illegal fishing practices; and
- practical recording tools (logbook, paybook) used by local fishers and foreign operators.
- **Non-sustainable and destructive fishing practices**
  - ban destructive fishing practices (poisons, explosives, traps, and hookah) in favour of hook-and-line fishing techniques;
  - ban targeting of spawning aggregation sites and prohibit the export of known aggregating species during known spawning seasons;
  - set conservative minimum and maximum size limits for main target species;
  - limit or ban exports of endangered and vulnerable species utilising where relevant international treaties (e.g. CITES); and
  - limit the capture and export of live wild-caught fingerlings for grow-out.
- **Zoning**
  - designate “no take” fishing areas through seasonal closures (spawning aggregation sites) or permanent closures (marine protected areas).
- **Fishery status**
  - periodic assessment of fishery resources and level of exploitation;
  - application of the precautionary principle; and
  - recognition of coincident LRFF fisheries and artisanal or subsistence fisheries.

The workshop proceedings have been synthesised into a comprehensive draft standards document and are currently with workshop participants for review, discussion and revision. The finalised workshop outcomes will be incorporated into the overarching standards documentation that embraces the entire chain of custody covering wild harvest, aquaculture and import, holding, distribution and marketing.

It is hoped that these standards and the supporting documentation will strengthen the efforts of the many government agencies and NGOs engaged in improving management of the LRFFT. They can be used to encourage more responsible fishing practices, and, where appropriate, provide for improved livelihoods for local fishers and a sustainable live reef food fish trade.

