The Asia-Pacific region is home to approximately 45% of the world’s coral reefs. These coral reef systems provide livelihoods and food for millions of people in coastal communities. According to a study by the World Resources Institute (Bryant et al. 1998), 80% of Southeast Asia’s reefs are at serious risk of degradation and 56% are at high risk, with the situation being slightly better in the Western Pacific and the Indian Ocean. One of the most serious threats to coral reef ecosystems and biodiversity in the Asia-Pacific region is the use of destructive fishing practices. The term “destructive fishing” has been widely used to describe the impacts arising from the regional trade in live reef food fish, including the use of poisons such as cyanide, the use of destructive fishing gear, targeting of spawning aggregations, and most importantly, overfishing of fish stocks (Sadovy et al. 2003; Sadovy and Vincent 2002; Warren-Rhodes et al. 2003).

The live reef food fish trade (LRFFT), which involves mainly grouper species (family Serranidae), has been satisfying the growing Asian demand for high quality fish, especially in Hong Kong and southern China, for more than three decades. In recent years, the trade has become much more widespread throughout the region (Sadovy et al. 2003). Because it is lucrative, the trade is regarded as a serious and expanding driver of destructive fishing in the region. In meeting the demands of the LRFFT many traditional supply economies, such as Indonesia, Vietnam, Thailand and the Philippines, have progressively depleted their inshore reef fish resources, usually to the detriment of coastal communities adjacent to these reefs. Continued overexploitation of reef resources in the Asia-Pacific region, in concert with the ongoing use of harmful fishing practices, has endangered the sustainability and future of what could be a profitable industry benefiting many people in the region.

Recognition of the need to mitigate the trade’s destructive impact on coral reef systems and to provide a foundation for enhancing the industry’s sustainability led to a workshop in Honolulu in 2001 to develop appropriate strategies (Graham et al. 2001). The workshop was attended by representatives of all key non-governmental organisations (NGOs) involved in the LRFFT. One of the strategies identified at this meeting was the development of industry-wide “best practice standards” for the trade, covering the chain of custody from reef to restaurant.

With the endorsement of the Fisheries Working Group of the Asia-Pacific Economic Cooperation (APEC) and funding from APEC and the MacArthur Foundation, a multi-organisational effort to develop an environmentally and socially responsible standard of best practice for the trade was launched in 2002. The goal was to bring together stakeholders, and build consensus on what “best practices” were needed to enhance industry sustainability. The project was headed by The Nature Conservancy (TNC) and the Marine Aquarium Council (MAC). MAC, which is the only organisation to have developed industry standards for a live reef fish trade (i.e. the marine ornamental industry), took responsibility for coordination of the project and delivery of outcomes.

The International Standard for the Trade in Live Reef Food Fish (the Standard), which was finalised in late 2004, is the result of an iterative collaborative process. In order to gain broad acceptance for the idea of a standard, to understand the boundaries and limitations of any such standard, and to produce robust and credible best practices, the cooperation of all industry members was essential. This process of multi-stakeholder engagement involved:

- extensive informal consultations with individuals and organisations with experience in and knowledge of the trade;
- participation of APEC member economies with a history of involvement in the LRFFT;
- formation of a 100-plus member “Standards Advisory Group” made up of a broad range of stakeholders.

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2. Marine Aquarium Council, Makati City Metro Manila, Philippines. Email: P1G1Scott@aol.com
3. The regional LRFFT has an estimated retail value of 450–500 million US dollars annually (Sadovy et al. 2003).
stakeholders in source and market countries, to review and comment on various iterations of the Standard;
• ongoing dialogue with all participants in the live reef food fish industry (fishers, suppliers, buyers, importers, wholesalers, distributors, restaurants and consumers) through in-country workshops, seminars and other fora; and
• field-based assessment of the standard to evaluate in-country capacity to attain the proposed benchmarks for capture, farming and distribution of LRFF and management of the trade.

The Standard was initially developed as a voluntary code of conduct for use by industry, government, and marine conservation organisations to improve the operation of their live reef fish food fisheries. The aim of the Standard was to make these high-value fisheries more sustainable and, specifically, to make them more capable of providing improved livelihoods for local fishers, providing a stable and healthy supply of live reef food fish to the market, and supporting the conservation of reef habitats.

The following sections: discuss the relationship between collaborative management models and the Standard, provide a brief overview of the Standard structure, and set out a proposed plan for taking the Standard from a voluntary scheme to a third-party certification program.

Collaborative management models

Fisheries resources around the world are declining at alarming rates. From large-scale industrial operations to small-scale artisanal fleets, fisheries are suffering from failures in the three fundamental areas of biological, social and economic sustainability. Collaborative management approaches are being seen as playing an increasingly essential role in fisheries management (Martin-Smith et al. 2004). Involving stakeholders in decisions affecting the fishery is seen as increasingly important for successful management of fisheries resources (Pomeroy 1995; Pomeroy et al. 2001).

The rationale for such participation by stakeholders is that collaboration among the various parties with a vested interest in a resource is likely to lead to better management and more sustainable trade and development. A number of management programs based on agreed-upon principles have indeed succeeded in protecting resources, guaranteeing product quality, and promoting trade. As a result, environmentalists, industry participants and end users alike have embraced such methods, recognising the mutually beneficial objectives and results of these programs.

One suite of collaborative approaches that is becoming more widely accepted is the use of common principles and standards of best practice as a means to conserve resources, regulate product quality and promote more responsible trading. A number of different collaborative models based on such standards and principles have been proposed for achieving improved resource management, including:

• industry standards,
• voluntary codes of conduct, and
• certification and ecolabeling.

Each of these approaches is ascribed varying levels of credibility and acceptance by end users and governmental or implementing agencies. Industry standards entail self-declaration by industry members (sometimes known as first-party certification). As industry members both choose the criteria for inclusion and certify themselves, this approach usually has no national or international credibility. Industry standards can also describe national or regional management schemes. This approach entails compliance with an agreed-upon standard that has been developed via collaborative input from relevant stakeholders, including industry, governments and NGOs, and is often referred to as second-party certification. Compliance in this instance is usually overseen by an independent body comprising one or several stakeholder groups. While this approach has more credibility than first-party certification, that credibility usually only extends as far as applicable national or regional borders.

Voluntary codes of conduct and certification and ecolabeling schemes represent successive steps in the third-party certification process. While both are developed through an international consultative process, each requires different levels of accordance or compliance. Codes, such as the FAO (Food and Agriculture Organization of the United Nations) Code of Conduct for Responsible Fisheries, provide frameworks for coordinated national, regional and international efforts relating to sustainable use of resources. While participation is voluntary, these codes can carry international weight in the form of “signatory membership” or through governmental interventions. Codes of conduct and industry standards can be given more authority when brought under a third-party certification program. While such certification programs carry the endorsement of governments, these programs are usually born out of strategic partnerships between business and environmental groups and are often brokered by conservation-oriented NGOs. The goal of achieving sustainable resource use is primarily achieved
through an incentive-based approach that aims to reward businesses for compliance with an agreed-to set of principles or standards.

Hybrid models of the above approaches are also possible. For example, the production end of the market chain could be subject to compliance with nationally or internationally agreed-upon principles enforced through national or provincial governments, leading to certification, while the demand end of the market chain is subject to a nationally or internationally endorsed voluntary code of compliance enforced through consumer preferences.

The need for an international standard for the LRFFT

Although a number of government agencies, regional agencies, industry bodies and NGOs have made important and effective efforts to address the impacts of the LRFFT, many of these activities have been undertaken in isolation or have only addressed specific aspects of the industry’s impact on fish resources. No single government or other agency has been in a position to work with the industry’s full “chain of custody” with a view to effecting industry-wide transformation.

The LRFFT comprises two distinct sectors involving LRFF supplied from approximately 20 countries: that which supplies markets in Hong Kong and China with wild-caught reef fish, and that which supplies these markets with “cultured” fish. In the case of cultured fish, it has been recognised that a large proportion of the total volume traded (15–40%) comes from the capture and grow-out of wild-caught juveniles, while only a small percentage (10–15%) is reared from eggs to market-sized fish through full-cycle mariculture (Sadovy et al. 2003). This dependence on juvenile wild-caught fish for grow-out highlights the need for the Standard to address both the wild-caught and mariculture sectors of the trade simultaneously.

Accordingly, the Standard encompasses all aspects of the production and management of both wild-caught and cultured fish entering the LRFFT. It also addresses the distribution, trade and consumption of LRFF. Intentionally, the scope of the Standard embraces the whole chain of custody for LRFF products, and includes fishers, traders, exporters, importers, wholesalers, restaurateurs and consumers.

The primary objective in developing the Standard was to have it serve as a comprehensive guide to assist governments, NGOs and regional agencies engaged in LRFFT-related activities in their work with stakeholders at various stages along the market chain. Moreover, it was hoped that the Standard would be a tool for promoting partnerships and/or collaboration between multi-sector stakeholders (communities, governments, NGOs and the private sector) in order to improve the management of the LRFFT.

Collaborative management models and the Standard

Successful management programs are usually based on agreed-upon standards developed through a collaborative process involving the participation of as broad a range of stakeholders as possible. The Standards project team reviewed possible collaborative management frameworks under which the Standard could be applied. Consensus was reached that a voluntary code of conduct approach was the most suitable starting point for developing the Standard. The FAO Code of Conduct for Responsible Fisheries provided an obvious model for the LRFFT.

Many codes of conduct are criticized for being overly vague, for failing to be adequately implemented and for lacking sufficient monitoring of compliance. Any code of conduct must address these issues in order to be truly effective. In developing the Standard, the project team adopted a principle-type approach in recognition that the Standard should be a concise document that is relatively easy to understand rather than the complex text that makes up some of the other international standards or codes that have been developed. This approach was also preferred to a more prescriptive stance, as it provides a framework whereby national management agencies are able to incorporate these universal principles into their national management plans in a way that suits their needs (Cochrane 2000; Peacey 2001).

Like the FAO Code of Conduct, the Standard was initially conceived as a set of key principles and criteria, compliance with which would be voluntary. However, throughout the Standard development process, it was recognised that the Standard might eventually form the basis for an international third-party certification program (Graham et al. 2001). Thus, from the beginning of the Standard develop-

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4. A principle-type approach is a top-down approach whereby overarching principles highlight key considerations accepted as critical to devising or improving the operation and management of the fishery in terms of biological, ecological, social and economic considerations. Under each principle a number of sub-principles and sub-sub-principles are added which put flesh on the bones of these principles in the form of specific guidelines or criteria as to how fishery managers can fulfil their responsibilities in terms of adhering to these principles (see Cochrane 2000).
The unique characteristics of the LRFFT as a tropical small-scale fishery did, however, present valid arguments for the unsuitability of implementing a certification program within the trade. Such characteristics included: the large volume and number of species traded, the remoteness of fishing grounds, and the large number of landing sites and data limitations (Pauly 1997). Moreover, the limited institutional and financial capacity to undertake resource assessment and monitoring to manage the fishery and achieve compliance and to overcome issues such as corruption and the potential for fraudulent reporting was a major concern with respect to the feasibility of a certification system within the LRFFT (Gardiner and Viswanathan 2004). A number of other limitations and challenges of the certification approach in developing-country fisheries have been identified. These include the potential for distorting existing practices and livelihoods, for creating market incentives that favour the export of certified fish and the need for establishing criteria that are equally achievable for fishers in developing and developed countries (Gardiner and Viswanathan 2004). Certification programs can be tailored to accommodate such characteristics, however, and a community-based certification program presented one alternative approach for dealing with the small-scale artisanal nature of the LRFFT (Civic Exchange 2001).

The challenges inherent in introducing a third-party certification program into the LRFFT are not restricted to the supply end of the market chain. The critical factor that determines the success or failure of any certification scheme is consumer acceptance and participation. Empirical studies have shown that consumers in the US and Europe are willing to pay more for food that is certified as coming from a sustainable source (Wessels et al. 1999; Johnston et al. 2001). Results from these studies suggest, however, that consumers will continue to prefer certified products only so long as the price premium associated with that product is not excessively large. The response of consumers to eco-labeling schemes varies greatly among regions and countries. Most future expansion in demand for fishery products is anticipated to occur in Asia and Latin America, where consumers are presently not very responsive to eco-labeling of fish and fishery products (Gardiner and Viswanathan 2004).

The scope for using certification in a fishery such as the LRFFT appears limited in the short to medium term and will require considerable consumer education and outreach to alter current consumer preferences. Although the main consumers of LRFF may not exhibit “green” preferences, countries from which LRFF are sourced are under increased international scrutiny. To this end, pressure can be placed on supply country governments by other governments and NGOs to encourage them to impose greater controls on LRFF fishery participants. For example, they can require that fishery participants comply with specific export requirements.

One of the downsides of certification programs is the sometimes high costs of compliance. On the supply side, an important question is the extent to which producing a sustainable product would increase production costs. In addition to production costs there are downstream costs associated with maintaining the “chain of custody” required to ensure certified commodities are not contaminated with non-certified commodities (Sedjo and Swallow 2002). It can be argued that a price premium paid by consumers may defray these additional costs. However, this is contingent on the product being sold into a receptive consumer market. Alternatives have been suggested for developing-country fisheries, including labels of geographic origin and fair trade labeling schemes. The latter ensure that artisanal fishers’ livelihoods are maintained and that fishers are rewarded for non-destructive, environmentally selective fishing methods (Gardiner and Viswanathan 2004).

The issue of cost has particular resonance in fisheries such as LRFF fisheries, which are mostly artisanal in nature and which have complex market chains involving numerous agents and intermediaries (Sadovy et al. 2003). Based on the experience of MAC, it is anticipated that the costs of certification would be minimal in relation to the high values of LRFFT products. Also, the participatory approach involving fishing communities...
and NGOs, as practiced by MAC, offers a cost-effective means of certification. Furthermore, targeting the efforts at specific points along the market chain can redistribute the costs of certification more equitably.

One area of the LRFFT where the Standards project team deemed certification to be more immediately feasible was in the mariculture sector. While mariculture is often not conducted in an environmentally responsible manner, and is consequently branded as an unsustainable industry, the structure of the LRFF mariculture industry appears to lend itself more easily to a certification framework than does the wild-caught sector. For example, the various stages of culturing LRFF (hatchery, nursery, grow-out and distribution), the proximity of farms to distribution centres and the generic and replicable production processes all suggest a reasonable likelihood of successful implementation of a certification program.

The International Standard for the Trade in Live Reef Food Fish

As previously noted, the Standard encompasses all aspects of the supply and demand for LRFF and includes both the capture of wild fish and the culture of LRFF, as well as the handling, holding, distribution and marketing of these fish. While the Standard addresses wild-caught and cultured supplies separately, it does recognize the relationship between them. Under each of the sections of the Standard pertaining to the supply of LRFF, sub-sections address management and the operational practices of fishers and farmers identified by stakeholders as essential to ensuring a more responsible and sustainable trade. From the demand end, sub-sections addressed the trading and consumption of LRFF.

The Standard itself is comprised of key criteria that were agreed-upon through multi-stakeholder consultations as being those best practices needed to improve the conduct of the industry and enhance industry sustainability. These criteria are referred to as “Requirements”. Attention was paid to ensuring that these requirements were practical and specific to the LRFFT. Moreover, these requirements recognized the importance of conducting LRFF fisheries in a manner consistent with relevant local and national laws and standards.

While the Standard document itself was deliberately concise, it was recognised that more prescriptive best practice guidance would be needed to clarify and augment each of the requirements. It was further recognised that more specific manuals and handbooks would be needed to explain how these requirements could be implemented or complied with. Together, these best practices and implementation guides would ensure that the meaning and intent of the requirements were clear and describe how participants in the LRFFT could satisfy each of the criteria (Fig. 1).

It was recognised early on by the project team that there was an abundance of existing training and instructional manuals available, but acquiring these materials would be ponderous and time-consuming for stakeholders and industry participants. There was thus a need for a more efficient and accessible alternative.

Considerable time was spent looking at alternative ways of improving access to these materials, and it was decided that the best-practice guidance should take the form of an “implementation toolkit”. Eventually it was decided that the toolkit should take the form of a world wide web-style CD-ROM containing all the relevant information pertaining to the Standard, including a library of existing papers, reports, manuals and toolkits in electronic format.

Subsequently the Standards project team agreed to supplement the CD compendium with the establishment of a website dedicated to LRFFT issues in general. Initially, however, the website would comprise only the Standard and all the best-practice and implementation guidelines that accompany it on the CD. The website address is http://www.livefoodfishtrade.org. The home page for the website and as it appears on the CD-ROM compendium is shown in Figure 2.
The Standard: A proposed plan of implementation

As noted above, the purpose of the Standards project was to produce a credible and robust international standard for the trade in live reef food fish. Having produced the Standard, the project team considered possible options for broader implementation. These included self-declaration by industry participants (first-party certification), compliance to the Standard within a program operated by a LRFFT trade association (second-party certification), and third-party certification analogous to that being undertaken by MAC for the international trade in ornamental fishery products. While the nature and characteristics of the LRFFT certainly make certification a challenging option, it is contended that a third-party certification program represents the best way forward for transforming the trade. The remainder of this article outlines a program for implementing the Standard under such a program.

The demand from informed consumers for environmentally sound products provides incentives for industries to adopt and adhere to standards for quality and sustainability. While the idea of effecting positive change in the LRFFT through the application of third-party certification has not yet garnered industry-wide support, responsible stakeholders are able to see the need and opportunity for certification to ensure a more sustainable and environmentally sound LRFFT.

For example:

- Governments and coastal communities in exporting countries want a sustainable, environmentally sound trade that provides income generation and support for reef stewardship, conservation and management.
- Governments in importing countries want their consumers, policies and legislation to support a sustainable, environmentally sound trade that provides incentives for reef stewardship, conservation and management.
- LRFFT industry participants want an industry that produces safe, high quality products using sustainable practices. The industry also wants minimal mortality, healthy animals, a healthy bottom line (there is no profit in a dead fish), a sustainable supply (i.e. healthy, productive reefs) and standards that codify best practices and create a level playing field for all participants.
- Conservation organisations want a sustainable, environmentally sound trade that provides incentives for reef stewardship, conservation and management.

By encouraging compliance with credible, international, multi-stakeholder standards of best-practice, certification can assist the LRFFT in becoming more responsible and sustainable. Certification will allow the industry and market to reject unsustainable, sub-standard practices and products. Sub-standard
operators will be encouraged by the market to either improve their practices or lose market support and leave the trade. Certification can also promote sustainable financing from industry for conservation, whereby the industry supports the monitoring, conservation and management of reefs.

Developing countries, and even developed countries, often do not have the funds to create, implement and enforce laws and management plans that are capable of protecting all reefs all the time. Coastal communities with incentives to manage and conserve reefs may be the best hope for widespread, ongoing, effective and financially sustainable reef conservation and management. With market incentives and independent certification, coastal communities involved in the LRFFT would have greater motivation to engage in the management and conservation of their reefs, often in remote areas rarely visited by government.

The LRFFT involves more than 20 countries with a range of capabilities for managing and conserving their LRFF resources, for effecting change through improved practices and for ensuring compliance with the Standard. For example, in a country such as Australia, fishery participants would find it relatively easy to comply with the requirements of the Standard if a certification program were in operation. In other countries, such as Indonesia and the Philippines, it would require extensive outreach and capacity building for the LRFF industry to meet the minimum requirements of the Standard.

It is anticipated that because the Standard is a “living document”, subject to continuing revision and elaboration, it would be best to employ a two-phased approach for the adoption of a third-party certification program within the LRFFT. During the first phase the industry and local, national and regional agencies and organisations would be consulted, with the aim of creating a network of supply-side and demand-side industry participants and trade associations that are committed to complying with the requirements of the Standard. During this initial phase, various stakeholders would participate in a gap analysis whereby their activities would be assessed against the requirements of the Standard. An action plan would then prescribe remedial action to be undertaken to bring those stakeholders into compliance with the Standard.

At the end of phase 1, a detailed and comprehensive review would be undertaken to objectively measure the interest and involvement of industry members and local, national and regional agencies and other stakeholders in moving forward to a formal independent third-party certification program. A second phase, should it be supported, would entail outreach, capacity building and training, designing a third-party certification program, undertaking pre-certification audits in participating countries and training and accrediting third-party certifiers (Table 1).

It is proposed that a LRFFT Council be formed to oversee the two phases of implementation of the Standard. The Council would be comprised of certification organisations (e.g. MSC and MAC), industry associations, and local, national and regional agencies and organisations, with no single interest predominating. The Council would have the following roles and responsibilities:

- Oversee the endorsement of the Standard, ensuring that all relevant governments and industry organisations are included in a fully transparent process (see Appendix for a list of such entities).
- Conduct annual meetings to address proposals for changes to the LRFFT Standard, on the understanding that no such changes would be put into effect without endorsement by relevant industry groups and local, national and regional agencies and organisations (see Appendix).
- Oversee the various activities in support of the Standard and its implementation, including communications and promotion.
- Represent the Standard in dealings with government agencies and international bodies.

The question of the continuing need for the LRFFT Council would be assessed at the end of the initial phase of the project. Should the project proceed to the second phase, it is envisaged that at some point, responsibility for project implementation would shift from the Council to an independent body that would continue to run the certification program.

It is important to avoid the creation of a separate certification program just for the LRFFT. Should there be sufficient consensus for certification to the Standard, it would be appropriate to consider integrating this into an existing fish certification program. There is no organisation offering independent third-party certification of food fish solely in the artisanal fishing sector or that addresses both mariculture and wild-capture fisheries. However, two organisations introduced previously in this article, MSC and MAC, collectively offer sufficient certification experience to cover these aspects of the LRFFT. They also oversee outreach, capacity building and extension training activities with fishers and fishing communities and exporters and importers. One fillip for the introduction of a certification program for the LRFFT is that many LRFF harvesters are already familiar with MAC certification programs, since many harvesters of LRFF also collect marine ornamental organisms.
Table 1. Proposed implementation plan for establishing a certification program for the LRFFT Standard.

<table>
<thead>
<tr>
<th>Year</th>
<th>Activity</th>
<th>1st Qtr</th>
<th>2nd Qtr</th>
<th>3rd Qtr</th>
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<tbody>
<tr>
<td>1</td>
<td>Establish LRFFT Council</td>
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<td>1</td>
<td>Undertake review of organisations that could act as secretariat to the LRFFT Council</td>
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<td>1</td>
<td>Appoint LRFFT Council secretariat</td>
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<td>1</td>
<td>Hold discussions with donors and private foundations with respect to continued funding of the LRFFT Council</td>
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<td>1</td>
<td>Establish relations with enabling agencies; that is, organisations and bodies capable of putting the Standard into practice (e.g. APEC, NACA, STREAM, SPREP, SPC, COREMAP)</td>
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<tr>
<td>1</td>
<td>Form LRFFT industry network comprising suppliers and purchasers of LRFF</td>
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<td>1</td>
<td>Undertake awareness programs with industry members and other organisations that have committed to complying with the Standard through formal certification, as and when appropriate</td>
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<td>1</td>
<td>Work with each APEC member economy to develop a LRFFT policy and implement plan</td>
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<tr>
<td>2</td>
<td>Agree on gap analysis criteria and program</td>
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<tr>
<td>2</td>
<td>Undertake gap analysis on industry members throughout the whole chain from demand side through to supply side</td>
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<tr>
<td>2</td>
<td>Agree to remedial action plans with each industry member</td>
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<td>2</td>
<td>Design outreach, capacity building and extension training program</td>
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<tr>
<td>2</td>
<td>Work with each APEC member economy to sign up to the LRFFT policy and implementation plan</td>
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<tr>
<td>End of Year 2</td>
<td>Detailed review to objectively measure buy-in from industry members and local, national and regional enabling agencies to ascertain whether outreach, capacity building and extension training should be undertaken as a precursor to formal certification under an independent third-party certification program. If the review is positive then the implementation continues into a second phase as follows:</td>
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<td>3</td>
<td>Undertake outreach, capacity building and extension training programs with industry members in various countries</td>
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<tr>
<td>4</td>
<td>Design third-party certification program</td>
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<td>4</td>
<td>Undertake pre-certification audits of industry members in various countries</td>
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<td>4</td>
<td>Plan certification program, and train and accredit independent third-party certifiers to LRFFT certification program</td>
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<td>4</td>
<td>Shift commences from LRFFT Council secretariat to the body that will manage LRFFT certification program</td>
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<tr>
<td>5</td>
<td>Undertake LRFFT certification audits</td>
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<tr>
<td>5</td>
<td>Issue certification to successful LRFFT industry members</td>
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</table>

Abbreviations:
APEC – Asia-Pacific Economic Cooperation
NACA – Network of Aquaculture Centres in Asia-Pacific
STREAM – Support to Regional Aquatic Resource Management
SPREP – South Pacific Regional Environment Programme
SPC – Secretariat of the Pacific Community
COREMAP – Coral Reef Rehabilitation and Management Program
Conclusions

Adoption of management programs based upon common principles and standards is a growing global trend. From protected species to non-endangered products, such programs have been put into place to conserve resources, regulate product quality and promote trade. Such principles and standards are representative of collaborative approaches to the management of fisheries resources that involve all stakeholders along the chain of custody for those resources.

This article has used the recently developed International Standard for the Trade in Live Reef Food Fish as an example of how collaborative resource management strategies can be applied to the LRFFT. The Standard in its current form is a voluntary code, fashioned around the key principles of the FAO Code of Conduct for Responsible Fisheries. It was developed with input from all LRFFT stakeholders, including industry, government agencies, NGOs, regional agencies and researchers and academics, as well as individuals with experience in developing fishery codes of conduct and standards. It is possible that this voluntary standard could, given sufficient stakeholder support, become the template for establishing an independent third-party certification program for the LRFFT.

Although the unique aspects of the LRFFT make implementing a certification program difficult, the LRFFT is not unsuitable for such a program. Given the current threats to the world’s coral reef ecosystems, collaborative resource management appears to be critically needed; a certification program to implement the recently developed Standard might be both possible and an important step forward in the management of the LRFFT and the region’s coral reef ecosystems.

It is hoped that this article provides information useful for stimulating thinking and discussion and facilitating the development of a collaborative management scheme suitable for the live reef food fish trade.

References


Appendix

Following is a list of industry groups and local, national and regional agencies and organisations that were involved in the development of the LRFFT Standard and that could be among those that endorse the Standard and any future changes to it.8

- Agriculture, Fisheries and Conservation Department, Hong Kong
- Asia-Pacific Economic Cooperation
- Balai Budidaya Laut, Lampung (National Seafarming Centre, Lampung)
- Bureau of Fisheries and Aquatic Resources, Philippines
- Badan Pengkajian Dan Penerapan Teknologi (Agency for the Assessment and Application of Technology), Indonesia
- Department of Fisheries, Ministry of Agriculture and Cooperative, Thailand
- Department of Fisheries, Vietnam
- Forum Kerapu Indonesia
- Great Barrier Reef Marine Park Authority
- Gondol Research Institute for Mariculture
- Hong Kong Chamber of Seafood Merchants
- Hong Kong Federation of Restaurants and Related Trades
- Hong Kong Food and Environmental Hygiene Department
- Industrinya Sa Dagat Association of Exporters, Philippines
- Marine Aquarium Council
- Marine Resource Industry Association, Philippines
- Marine Stewardship Council
- Ministry of Marine Affairs and Fisheries, Indonesia
- Network of Aquaculture Centers in Asia-Pacific
- Palawan Council for Sustainable Development
- National Fisheries Authority, Papua New Guinea
- Queensland Department of Primary Industries
- Queensland Fisheries Service
- Queensland Seafood Industry Association
- Seafood Services Australia
- Society for the Conservation of Reef Fish Aggregations
- Secretariat of the Pacific Community
- Taiwan Fish Breeding Association
- The Nature Conservancy
- University of the South Pacific
- WWF Hong Kong
- WWF Philippines
- World Resources Institute

8. This list does not include the numerous individuals and industry representatives who provided valuable input into the development of the LRFFT Standard.