THE LIVE REEF FOOD FISH TRADE (LRFFFT)

A SUPPLY CHAIN REVIEW AND MARKET INTERVENTION ANALYSIS

A Project of the Kingfisher Foundation
In cooperation with WWF

May 2011
This document summarizes the results of a rapid supply chain assessment for the Live Reef Food Fish Trade (LRFFT). The work was performed in spring 2011, by Matthew Elliott and Esther Jang of California Environmental Associates (CEA) www.ceaconsulting.com. It was conducted on behalf of the Kingfisher Foundation, and in collaboration with WWF.

All opinions and errors contained within this document are the sole responsibility of CEA.

Special thanks to Dr. Geoffrey Muldoon of WWF, who facilitated much of this work. Thanks as well to our expert reviewers: Dr. Art Hanson of the International Institute for Sustainable Development, Frazer McGilvray of Conservation International, Dr. Meryl Williams of AsiaPacific-FishWatch, Dr. Yvonne Sadovy of the University of Hong Kong, and Dr. Allen To of WWF Hong Kong.
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Project overview and methods

What was the purpose of this project and what was the methodology used? What were the primary findings of the analysis?

Project overview

This document summarizes the results of a rapid supply chain assessment for the Live Reef Food Fish Trade (LRFFT). The work was performed in February and March 2011, by California Environmental Associates (CEA). It was conducted on behalf of the Kingfisher Foundation, and in collaboration with WWF.

The project had two primary objectives:

1. Review, update, and deepen the collective understanding of the current supply chain for the LRFFT, including the flow of fish, its approximate value at each state of the chain, the number of actors involved in each link, and a more qualitative understanding of the relative dynamics and power structures contained within and along the market chain (see Appendix).
2. Based on the updated supply chain analysis, assess the implications for the viability of potential market or policy interventions aimed to create a more environmentally sustainable LRFFT.

The project had the following steps:

- Review of all available literature on the LRFFT (academic and grey literature).
- Review and update existing data sources on the LRFFT (Hong Kong import data from the Agriculture Fisheries and Conservation Department and Census and Statistics Department, FAO data, price data, etc.).
- Interview a dozen individuals with knowledge of the LRFFT
- Develop draft supply chain diagrams for discussion at the APEC-Fisheries Working Group and WWF co-sponsored LRFFT conference in Bali, Indonesia on March 1-3 2011.
- Facilitate a breakout session at APEC-WWF LRFFT conference, with a focus on updating the draft supply chains in the three main producing countries (Indonesia, the Philippines, and Malaysia) and the main end market (Hong Kong and China).
- Revise the draft supply chain documents developed and shared with the full set of conference participants (see Appendix for supply chain analysis).

The strategic implications of the supply chain for market-based interventions was drafted separately by CEA and shared with a small group of reviewers for additional comments (Geoffrey Muldoon, WWF; Art Hanson, IIID; Meryl Williams, Asia-Pacific FishWatch; Yvonne Sadovy, HKU; Frazer McGilvray, CI; Allen To, WWF).

The scope of this review did not extend into LRFFT aquaculture in any great detail, nor did it contain a detailed review of the political feasibility of cultivating greater interest in the LRFFT within the Chinese and Hong Kong governments.
Project rationale

The Live Reef Food Fish Trade is a small but lucrative sector of the seafood industry in Asia. Wild Live Reef Food Fish (LRFF) fisheries are concentrated in the Coral Triangle countries of Indonesia, the Philippines, and Malaysia, and driven largely by demand in Hong Kong and mainland China. Given the high prices fetched by some species such as coraltrout (*Plectropomus leopardus*) and humphead wrasse (*Cheilinus undulates*), the LRFFT has helped to fuel fishing effort in some of the richest coral reef ecosystems in the world, resulting in overexploitation and depletion of targeted stocks. That effort is directed toward species near the top of the food chain in coral reef ecosystems. The LRFFT has also been associated with destructive fishing practices, in particular the use of cyanide. Recently, an aquaculture industry has also emerged to supply some reef fish species to the live market – this report is primarily focused on wild fisheries.

In summary, the trade remains a serious threat to coral reef ecosystems and biodiversity in the region, with serial overfishing occurring in many or most regions, and destructive fishing practices compounding the damages.

The WWF Coral Triangle Network Initiative has helped to create and influence the debate among stakeholders, and has established ambitious conservation targets, including for the LRFFT. These targets are now being pursued by governments and partners in the Coral Triangle. Given the challenges in direct fisheries reform, there have been a handful of efforts over the last several years to tackle these LRFFT issues through the market, as opposed to the more traditional site-based conservation efforts or national fishery policies. Most recently, the APEC Fisheries Working Group and WWF co-sponsored an international workshop that aimed to improve management of the LRFFT through market-based initiatives and stronger regional cooperation. The workshop was hosted by the government of Indonesia and supported by APEC and WWF. Specifically, it aimed “to identify appropriate mechanisms or frameworks whereby the joint issues of trade and sustainability can be better addressed. These include: (1) refining measurable standards of best-practice such as the International LRFFT Standard with participation and support of all stakeholders, to ultimately facilitate the implementation of such standards; and (2) exploring the use of informal forums or networks to serve as a platform for dialogue and exchange between stakeholder and for building capacity and opportunities among these stakeholders to better manage the trade.”

This project was designed to link the investigation into market-based interventions with an honest assessment of the realities of the supply chain and the actors along it.

Market-based interventions (e.g. certification, buyer standards, moratoria, consumer guides, etc.) are indirect mechanisms to reform practices on the water. The design of new interventions should therefore be informed by the limitations of influencing the supply chain. At a minimum, a good intervention design requires an accurate understanding of the current structure and dynamics of the trade. In particular, it is important to understand the limitations of the portfolio of options given those realities.

As noted above, this work was commissioned to serve two basic functions. First, it updates the supply chain for the LRFFT (e.g. from Padilla et al., 2003) using the best available data and professional opinion, highlighting the major data gaps where they exist. Second, based on our understanding of the supply chain, this review is intended to serve as an independent assessment of the options for using market-based interventions to change it for the better.
Primary findings

In brief, LRFF is a very difficult commodity to influence through the market. A top-level analysis suggests that each major segment of the industry is resistant to the kind of changes that philanthropy would like to encourage:

- **Consumers**: At present, the end market for LRFF (mainly individual restaurants in China and Hong Kong) fundamentally does not care about sustainability. The culinary CSR movement is in its infancy in China, and it is assumed that consumers are currently not willing to pay more for environmentally preferable options and/or avoid eating LRFF in order to achieve more sustainable LRFF. This dynamic is likely to slowly change over the next five years. The vision and hope is that the dialogue could be led by environmental organizations, businesses and leaders in the Coral Triangle region. China’s existing Five Year Plan already calls for major shifts in thinking and action for sustainable development. The problem is that the LRFF does not enter into the dialogue, and one of the key challenges will be how to move LRFF onto that agenda. Currently, the situation is very difficult. Given that prices are driven up by scarcity, the *most depleted stocks* (e.g. humhead wrasse) can often fetch the *highest* prices. Apart from a handful of international hotel chains, none of the end consumers have significant brand vulnerability for NGOs to use as a leverage point. There are no Wal-Marts or other major end users that could collectively serve as an entry point and trigger for the rest of the industry. There are no international financing streams to try to use as a leverage point. Even if there were obvious viable approaches to dampen consumer demand, there is a legitimate argument to be made that these wild fisheries are fundamentally supply limited rather than demand limited: success in reducing demand by 30% is unlikely to reduce fishing effort by 30%, since the individual fisherman’s incentives are unchanged and the fishery remains open access.

- **Producers**: The fundamental problem on the water is a systemic failure of fishery management. This is not a situation where there are a handful of bad actors that market pressure can try to weed out. While there is an issue with the use of cyanide, the overarching problem is the overfishing of almost every LRFF stock. As one interviewee summarized, “It’s a fishery that’s dying. It’s almost dead to be honest.” Past efforts to regulate the industry have largely failed, and there are no readily available and easily implemented fishery management solutions. As a consequence, it is not clear what philanthropy would intend the market pressure to advocate for. Even if there were demand for “better” LRFF product, fishermen have few alternative livelihoods and are not organized to succeed in that endeavor.

- **Traders**: This is an industry largely defined by rampant unreported and often illegal trade. Efforts to organize legitimate traders as a force to implement procurement standards will be undercut by the legal traders’ rational fear that other traders will free ride off of their efforts, undermining their business. Furthermore, as noted above, there are really no “better” supplies for traders to select from, outside of Australia. Individual efforts by well intentioned traders to implement best practices have been notably unprofitable. Without any demand for change from buyers or mechanisms to improve fishery management on the water, the supply chain is profitably helping to drive LRFF fisheries toward exhaustion.

In net, LRFF are a hugely problematic set of fisheries, with no easy solution on the water; the LRFF market fundamentally doesn’t care about the environmental dimensions of the fishery; and a lucrative and often illegal trade complicates legal mechanisms to create change.
In this light, it’s apparent that the most commonly used market-based approaches in North America and Europe (e.g. consumer advisory work, major buyer purchasing standards, certification, and fishery improvement partnerships) are likely to have very little traction in this fishery in the next several years. Efforts to change public opinion (e.g. celebrity chefs in China) may have some traction, but will take many years if not decades to reach a sufficient scale to choke demand. As one interviewee summarized, the LRFFT may be the single most difficult commodity in the region to try to transform.

However, the LRFFT has an important Achilles heel. The defining characteristic of the trade is that it is heavily internationally traded. LRFFT is a relatively simple market supply chain, and it flows almost entirely to China. There are just a handful of major places and actors through which the bulk of the fish pass. Addressing these points in a highly strategic way is critical. The passage between countries subjects the industry to a level of regulatory scrutiny that it would not otherwise face (and does not face on the water). While the trade remains poorly documented, the increasing share of LRFF shipped by air is improving our collective ability to regulate it. Similarly, while sea-based shipments of LRFF have historically been relatively loosely controlled and documented, the likelihood is that only a couple hundred vessels are involved and the majority are believed to be registered and operating out of the Hong Kong harbor and Chinese ports.

Focusing on the trade dimensions of LRFF is not a panacea. Trade measures will do little to directly influence fishery practices on the water. Tightening the trade is at best only a starting point in a multi-decadal effort to improve this industry. But as long as there is a substantial flow of illegal and unreported product, any efforts to better control the market and trade will continue to be substantially undermined. Tackling the legality of the LRFFT will not create fishery management solutions, but it may make those solutions more tractable. Philanthropic efforts in other parts of the world have used addressing illegal landings as a natural entry point into working on environmental issues. For example, Greenpeace and Sustainable Fisheries Partnership used illegal landings as an entry point to promote broader reforms in the Barents Sea cod fishery.

There are a handful of clear priorities that emerge on the trade front:

1) **Fix the Hong Kong imports loophole** – Historically, any LRFF landed by fishing vessels in Hong Kong has not been classified as imports or food. This is believed to be the primary route for IUU fish. In early 2011, the Hong Kong Government announced the implementation of a new Food Safety Ordinance, which reclassifies LRFF as food, requires all local food producers, importers and distributors to register with the government, and to keep trade record (one step up and down the supply chain) for different time-frame depending on the food categories. The new ordinance may substantially improve data tracking.

2) **Link import data with export data** – To help reduce IUU, Hong Kong should share import country-of-origin data with the relevant government agencies in source countries.

3) **Track Hong Kong re-export data** – Currently, Hong Kong does not effectively track re-exports of LRFF to mainland China, especially those shipped by vessels or speedboats, preferring instead to turn a blind eye to LRFF entering China.

4) **Control vessel-based imports** – Hong Kong should consider creating a special public vessel registry for LRFFT vessels. This would allow exporting countries to black-list vessels involved in IUU.
5) **Create allies in the air carriers** – Pressure international air carriers to develop internal LRFFT policies, potentially only carrying fish for which there is proper documentation from complying states.

6) **Improve granularity of Chinese import data and enforcement** – Encourage China to develop better data tracking and enforcement on imports, primarily to discourage the illegal trade of LRFF that are skipping Hong Kong and being routed directly to China. China is not currently implementing CITES Appendix II for marine species, which represents a massive loophole that needs to be improved not only for the LRFFT, but for marine species generally. This assessment lacks a detailed institutional analysis of the situation within China, both in general with respect to natural resources sustainability, trade and investment, and sustainable development generally. And specifically, there is not institutional analysis of the various elements concerning the management of fisheries and aquaculture, or of trade in these commodities. There is a strong interest in promoting better environment and development on the part of central government and various provinces in China. These are important points because the Chinese government should have an expanded role in trying to bring problems such as the illegal fisheries trade under control, and influencing consumer and trader behavior, and stimulating sustainable aquaculture solutions.

To take this rapid analysis further would require exploring the political feasibility of cultivating greater interest in the LRFFT within the Chinese and Hong Kong governments, and more deeply investigating the business interests of the major traders and air carriers in long-term sustainable supplies.
Supply chain analysis: starting questions and initial findings

As a caveat, one of the principle findings of the supply chain analysis is that there is very poor data availability associated with this trade. This paucity of information includes stock status or biomass LRFF fisheries, spotty landings data, incomplete trade records, and very little hard information on economics and consumption. Much of the analysis in this report and in the Appendix stems from the professional judgment of the community assembled at the WWF-APEC workshop.

The supply chain investigation was structured to help answer several overarching sets of questions around the production, consumption and trade of LRFF.

Production dimensions of the LRFF fisheries

What percentage of global production currently comes from each of the main source countries? For each of these places, what is the state of fisheries management for LRFF? Is there limited access? Quotas? TURF systems? To what extent does illegal activity undermine fishery management efforts? If demand fell off, would the fishing effort continue anyways? Is there a solution on the water to actually support? Are these fisheries certifiable in any major system?

While there is no reliable country-level export data, the best available information (Hong Kong import data) suggests that between half and two-thirds of the LRFFT originates in three countries: Indonesia, the Philippines, and Malaysia. There is substantial trade between the three (e.g. IUU fish from the Philippines through Malaysia), such that even these numbers, in terms of the ultimate source of the fish, are not entirely reliable (see Appendix for supply chain diagrams).

Of the other sources of fish, Taiwan and Thailand are significant suppliers of farmed LRFF. Expert opinion from the APEC workshop breakout group on market demand indicates that Taiwan now exports over 25,000 tons of farmed LRFF per year, essentially all to China and Hong Kong, which would make it the large single supplier if true. China also has a substantial domestic aquaculture industry, nearly all of which is consumed domestically. Australia is the other important supplier of wild LRFF, mainly of Leopard Coral grouper (*Plectropomus leopardus*). Other wild fisheries include Papua New Guinea, the Solomon Islands, and Palau.
In the three major wild LRFF source countries (Indonesia, the Philippines, and Malaysia), management of reef fisheries is poor or non-existent, and the LRFFT is just one small piece. As one interviewee commented, “It’s a micro, micro fishery.” LRFF are a small but very valuable component of a much larger set of reef-based artisanal and subsistence fisheries. Typically, fisheries in the region are essentially open access with fragmented local, regional, and national control. LRFF fisheries are also open access, no quotas are set (outside of Australia), and much of the management focus is on eliminating the worst gear types (e.g. cyanide), possibly protecting spawning aggregation sites (use of MPAs as harvest refugia or conservation areas is not commonplace), or somehow limiting capacity (e.g. limiting licenses or establishing export quotas). Production of LRFF within each country is poorly documented, and the general opinion is that in almost every region reef fisheries are being overexploited. This has resulted in fishers capturing and retaining smaller, juvenile fish for grow-out to market size. The new market for the growout of juvenile reef fish has intensified overfishing pressure, since there is no longer a need for minimum size requirements. In addition, it has triggered a secondary market for small pelagic fish and “trash fish” that are needed to feed the grouper in the growout cages. Moreover, to offset these localized depletions, fishermen are moving to more remote locations in search of the few remaining unexploited stocks. It was not clear to this reviewer that there is an obvious fishery management solution to support. Eliminating the worst practices (e.g. cyanide use, overexploitation of humphead wrasse fisheries, sub-minimum sizes, etc.) is a necessary but not nearly sufficient solution to the fundamental overfishing problem at hand. Apart from the Australian fisheries, it was not clear that there are any examples of well-managed LRFF fisheries. As one interviewee commented, “It’s an absolute nightmare to manage…. I don’t think there is any possible management intervention you can do apart from ban it.” However, even efforts to ban the fishery have proven ineffective. For example, efforts to control or limit the fishery in Palawan, Philippines have been undermined by municipalities continuing the trade and routing fish through permissible export points in the north of Palawan or south through Malaysia.
The number of fishermen involved in the trade is also non-trivial. The workshop panels estimated that there are 27,000 in the Philippines, 7,000-8,000 in Indonesia, and another 1,000 in Malaysia, or over 35,000 fishermen in the coral triangle (see Appendix). Many of those fishermen have limited alternative livelihoods – in some cases the LRFF industry is a trade of last resort. In other cases, the LRFFT can be very lucrative. LRFF fishers can make between 4-6 times average income in Philippines and as much or more than many government officials and financial sector employees in Sabah. There are no great technical outreach centers or collectives of fishermen to work with on better practices.

Consumers of LRFF

*What share of global consumption goes to what final end markets? Who are the end consumers and do they care about responsible consumption? Have they demonstrated responsible consumption attitudes towards anything else (e.g. shark fin)? Does any major consumer have brand vulnerability? Is there a higher price at which demand would decrease? Are any buyers engaged in fishery improvement type projects?*

Authorities lack reliable data to track LRFF to the end consumers. Essentially only Hong Kong collects and shares decent import data, but even that has gaping holes in it (e.g. landings by fishing vessels, and re-exports from Hong Kong to China). Reliable trade data from major countries like China, Philippines, Singapore, Malaysia, or Indonesia is also missing.

Based on the available data and professional opinion, at this point workshop participants strongly believe that China is the single largest market for LRFFT (including re-exports from Hong Kong) and that it will only become a larger market in the future. Within China, the Pearl River Delta is believed to account for 75% of China’s consumption, and Guangdong Province makes up 75% of the Pearl River Delta’s demand. In terms of cities, Guangzhou, Shanghai, Shenzhen, Xiamen and Beijing are the cities with highest LRFF consumption, but LRFF are now found in most coastal cities and provincial capitals. About 90% of the consumption occurs in restaurants; supermarkets and home consumption is very small. Wild fish fetch a 10-20% premium over farmed fish. Moreover, wild-caught fish trading in mainland China can fetch as much as a 50% premium over those same fish sold in Hong Kong.

Outside of China, workshop participants believed that Hong Kong is the next largest market, followed by domestic consumption within source countries (e.g. Malaysia, Indonesia – often of sub-par fish) and lesser export markets like Singapore.

Currently, the sustainability of LRFF is a very low priority for consumers in any of its markets. The CSR movement in Asia is in a very early stage. Current penetration rates for organic food, FSC-certified timber, MSC-certified fish, fair trade coffee, or any other ecolabeled product is very low in this region, though it is increasing. Sustainable seafood is not yet a concept with much traction, and cuisine like sharkfin soup and humphead wrasse remain status symbols for a growing middle class. With respect to LRFF specifically, the Perishables Group recently conducted a survey of chefs in the region, which confirmed that sustainability is a lower priority than price, freshness, quality, or other characteristics. Awareness and interest in the issue will essentially need to be built from scratch. To that end, WWF is doing some work to build awareness in both Hong Kong and Singapore (e.g. consumer seafood cards and corporate outreach), with the hope that Hong Kong may be a bellweather for trends in mainland China. The most likely actors to engage on sustainability are the large hotel chains, such as Marriott which already has an international position on sustainable fish. Apart from Marriott, there have not yet been any major corporate commitments in Hong Kong or mainland China around sustainable
seafood. The fact that 90% of the trade goes through restaurants indicates that even a series of major commitments involving hotel chains would only touch on a small component of the trade.

**Traders of LRFF**

*What is the total value of the trade? What is the percentage of the trade that is not recorded in the official export numbers of the key source countries? How many traders are there at each point in the supply chain? How much control do they have? Is there a natural ‘choke’ point where pressure can be applied more effectively? Are there international trade options like CITES that can limit the trade? Does any group of actors have the ability to influence practices on the water or in the marketplace?*

The total value of the LRFFT is estimated in this analysis to be about $2B per year (see Appendix for the analysis), though this rough estimate entirely ignores domestic aquaculture production within China and Taiwan. (As previously noted, a combination of pond, net pen, and tank systems now produce the majority of LRFF on the global market.)

It is evident that much of trade is not well reported or even legal. The $2B estimate takes account of the third of the trade into Hong Kong that is not properly documented (e.g. that which comes via live transport vessel and is poorly reported) and the other trade (e.g. the domestic markets, some direct shipments to China) that is also essentially undocumented. Workshop estimates from source countries suggest that one quarter of the Indonesian exports, over half the exports from the Philippines, and the majority of the Malaysian exports are unreported or IUU. While the actual fraction is unknown, there is consensus that the industry has substantial unreported trade flows.

The largest pathway for imported LRFF to mainland China is via Hong Kong, with the fish re-exported, mostly unreported or illegally, to Shenzhen (where the largest importers/wholesalers are), then by truck to Guangzhou whereupon they are distributed throughout China. Essentially any LRFF shipped by air is routed through Hong Kong in order to avoid the import tariffs in mainland China. LRFFT flown into Hong Kong generally comes as freight on board commercial airlines such as Cathy Pacific, Garuda, and Singapore Airline. There is also an unquantified amount of LRFF that goes directly to China by vessel. For example, Xiamen is the main port for live groupers, almost all from aquaculture, exported from Taiwan by sea. Currently, Taiwan operates 13 such transportation vessels, and three more will join the group in 2011. These vessels operate independent of the producers or importers.

Once inside mainland China, LRFF are shipped from Shenzhen by trucks to coastal cities, including Beijing. Approximately 90% of the internal transportation is by specialized truck. The major exception is for fish bound for western cities, such as Xian, in which case cargo planes are used. Other sources report that there is some air freight of LRFF from Guangzhou to Shanghai and Beijing as well. Workshop participants did not know which airlines are used for domestic shipment.

In terms of the number of actors, the LRFFT essentially has an hourglass shape. There are thousands and thousands of fishermen that catch LRFF, and there are thousands and thousands of restaurants that sell LRFF. In the middle of the supply chain, the number of actors is probably an order of magnitude smaller. There are dozens to hundreds of middlemen in each source country, with typically a handful of major exporters or vessel operators. Similarly, both China and Hong Kong have a variety of traders, wholesalers, and distributors. However, in Hong Kong, the Chamber of Seafood Merchants represents a large majority of importers and re-exporters, and has fewer than a hundred companies...
in its membership. There are probably ten to twenty major traders that collectively represent the majority of the LRFFT.

It is unclear however, whether any group of traders, either in source or demand countries, who has sufficient clout to influence practices on the water. A complicating factor is that many traders have other businesses and lines of commerce, and it is not apparent how interested they are in sustainability issues in the LRFF. There is one trader in Indonesia who has implemented an aggressive set of sustainability standards for his own business (e.g. minimum size requirements, no cyanide, no humphead wrasse, rotating fishing grounds, etc.). However, he has sacrificed much of the potential profitability of his business, which begs the question of how scalable the approach is in a competitive market. To be transformative, this approach would need to be at scale, and would require a mechanism to address the free rider problem for both traders and other fishermen that undermine these efforts. An initial analysis of the major traders to gauge their interest in long-term sustainability of supply or secure tenure rights would be an interesting starting point.
Overarching implications of the supply chain analysis for LRFFT work

While there are many types of market interventions, there are a number of positive factors associate with success such as:

a non-trivial fraction of end consumers that deeply care about the issue; market consolidation at the point of sale; retailers or others in the supply chain with high brand vulnerability; clear standards in place for better product; relatively simple traceability; a low cost differential between better and worse products; and clear regulatory changes that can be triggered through the market interventions.

In contrast, it is very difficult to create a market intervention when the market (e.g. consumers) doesn’t care, when the trade is too opaque to understand (e.g. no traceability, high IUU), and/or when there is no obvious solution being proposed.

Based on the initial review of the supply chain, it is apparent that there are a number of factors that are likely to complicate any effort to reform the trade through market-based approaches. However, there are also a number of positive factors that should be considered. A first set of those challenges and opportunities is listed here.

Challenges to improving the LRFFT through market approaches

1) In terms of a better supply of LRFF, no viable solutions on the water are apparent. There is not currently a sufficient supply of live reef food fish products that meet “best practices” at the production level apart from possibly Australia and some farmed product. The market pressure cannot work unless there is a clear change on the water that it is trying to create. As a consequence, it is difficult to direct buyers to something “else” that is better.

2) Illegal fishing is rampant. While there are laws and regulations in most countries in terms of number of fishermen, permits to trade, and gears used, they are often not followed. No countries outside of Australia currently have effective TACs for LRFF in place. Policy reform efforts place considerable attention on protecting spawning aggregation sites, which is critical but not sufficient. In a few places there are concentrated efforts to set up TURF-like systems, but even those are the exception.

3) Many of the fishermen who catch the fish are independent, largely unregulated, and have few viable alternative livelihoods. Some fishers are trapped in a system of patronage and debt that requires they sell their product exclusively to a single middleman who provides boats, gear and loans during bad seasons. Others earn lucrative incomes they do not want to give up.

4) There is no existing certification system that could be applied to better practices; and it would be costly to develop one. The characteristics of the trade and poor management of the fisheries mean LRFF are not appropriate for MSC, and there are no formal “fisheries in transition” programs in place for LRFF. The Fishery Improvement Partnership approach used by WWF, SFP and others is not
promising in the case of LRFF because there is no clear concentration of engaged buyers capable of exerting downward pressure on producers and processors (i.e. fishers and traders).

5) Illegal trade is also a problem. There are multiple source countries (Indonesia, Malaysia, Philippines) with illegal trade from the Philippines into Malaysia, and between all three into Hong Kong via boat. Efforts to limit exports (e.g. the proposed Palawan quota system) would likely be circumvented through illegal shipments (e.g. to Sabah) or transshipping to more lenient municipalities.

6) The end markets for the LRFFT do not have any brand vulnerability; they are mostly individual restaurants in China, on Hong Kong, and in other parts of Asia. There is little interest in CSR among any segment of the LRFFT, save multi-national hotel chains (e.g. Marriott) and a few selected restaurants.

7) No segment of the industry appears to be dependent on multi-laterals or Equator Banks for financing.

8) At current price levels the wild product (LRFF) is supply limited, rather than demand limited, meaning that production is relatively price inelastic at current levels. Fishermen will continue to race for fish, even if the price falls. Demand is also set to grow with the rising middle class in China. Fractionally reducing demand would not linearly reduce fishing effort.

9) Similarly, the increasing scarcity of the product is not an effective limit. Because LRFF are partly a status symbol, lower value species which may be more abundant are not effective substitutes for higher value species. Rather, they are complementary goods. The scarcity of the product may actually stimulate demand despite higher prices (e.g. bluefin tuna or diamonds).

**Positive factors in efforts to improve the LRFFT through market approaches**

1) The growth in aquaculture production may ultimately be able to ease the fishing pressure on some species if it can reduce escalation of prices (though the collection of juveniles for grow-out and feed issues are a challenge). Data from China and Hong Kong indicates that average prices have fallen marginally over the last decade, while prices for select wild caught species continue to rise. Farmed fish now represent the large majority of overall production. Culture activity is mostly made up of low value grouper species (including green, Malabar grouper) some mid-priced species (tiger and flowery) and one high priced spices (highfin grouper)

2) Traders, who are relatively powerful in LRFFT, presumably have an interest in ensuring long-term supply. While fishermen also have an interest in sustainability, it is more difficult to solve the commons problem in the absence of strong fishery management.

3) Supply chains are not that long – there are typically just 4-5 steps in the chain. Importantly, there are a few points of aggregation in the supply chain, including the Hong Kong and Chinese wholesale markets, the live reef fish import vessels, the Hong Kong Chamber of Seafood Merchants, and commercial freight airlines.
4) The illegal trade may be a natural point of intervention – in particular the carrier vessels that come into the Hong Kong port may be vulnerable to more stringent regulations, traceability requirements, and bi-lateral cooperation.

5) Grouper are semi-sessile and may be more easily managed with community-based systems or TURFs than more migratory pelagic fish. There are a handful of efforts to create community-based management that are promising if they can be scaled up. Community-based management systems have better prospects for combating IUU and improving long-term decision making.

6) There is increasing use of air freight to transport LRFF into Hong Kong and mainland China. These companies (Cathay Pacific, UPS, DHL, etc.) have much more vulnerable brands, and may be amenable to working with governments to improving the legality of the trade.

7) The Chinese, year by year, are shifting in their perspectives toward sustainability. In the next five years, it is possible that there will be a very different dialogue compared to what is taking place now. WWF Hong Kong is starting to lay the ground work now around building consumer and corporate awareness of seafood sustainability issues.
Potential campaigns around the LRFFT

The final piece of this report takes the suite of challenges and opportunities listed above and applies them to the potential campaigns that might be used to promote a better LRFFT.

The underlying objective of any campaign is to somehow create incentives for better fishery practices on the water. There needs to be a compelling rationale to leave fish in the water and to avoid using destructive gear. This can include positive incentives such as a price premium, enhanced market access benefits, or the long-term economic gain associated with rebuilding stocks. There can also be disincentives, such as penalties associated with fishery management enforcement, strong measures against illegal trade (boat seizures, jail time, etc.), or a reduction in the overall demand for LRFF by influencing consumer tastes.

For simplicity, this review has divided the world of market-based interventions into four basic categories:

1. **Certification and supply chain engagement**: Efforts to create positive incentives for fishermen to pursue better practices (e.g. ecolabeling or voluntary purchasing standards by industry)
2. **Consumer engagement**: Efforts to reduce demand for LRFF or to increase consumer demand for better products (e.g. consumer education or corporate buyer engagement)
3. **Substitution**: Efforts to promote alternative products (e.g. promoting aquaculture of LRFF in order to reduce price escalation and facilitate action by the supply chain)
4. **Trade interventions**: Efforts to better restrict or better regulate aspects of the trade of LRFF (e.g. tariffs, bans, and trade regulations)

1. **Certification and supply chain engagement**: efforts to create positive incentives for fishermen to pursue better practices

*What is the potential to create positive incentives for fishermen through certification or enhanced market access?*

There are several potential approaches that would fall into this category. The most commonly discussed efforts include:

- Certification or ecolabeling of better product to increase prices or improve market access
- Improved market access for better actors through fishery improvement partnership approaches, wherein buyers selectively purchase from fisheries engaged in improving their practices
- General promotion and voluntary adoption of best practice standards
- Payments for ecosystem services (PES)
Certification

*Is certification a feasible approach to the LRFFT? If not, where are main bottlenecks in the entire supply value chain that prohibit transformation and compliance with MSC or other relevant standards?*

In brief, certification or ecolabeling is *not* a promising approach for LRFF in the foreseeable future.

Without a doubt, the main bottleneck in transformation and compliance with MSC or another ecolabel is the absence of effective fishery management for reef fish, compounded by the strong role of illegal and undocumented trade. Reef fisheries in the region are generally overfished, with the compounding challenge of the use of destructive gear. In the absence of effective fishery management, LRFF is entirely uncertifiable. In truth, this extends beyond just reef fish, to essentially any other fishery in the region. Currently the only MSC certified fishery in Southeast Asia is the small, local Ben Tre hand-gathered clam fishery in Vietnam.

The supply chain has a compounding bottleneck in that there’s currently no market driver for better fishery management and performance. To the best of our knowledge, there is currently no evidence of willingness-to-pay for better practices from any end market for LRFF. As a broader proxy for this, the MSC label has essentially zero market penetration in Asia and is only now starting to make inroads in Japan. What little penetration the MSC does have in Asia is in imported packaged products sold in large retail chains; it is not for fresh or live fish or for products sold in restaurants or small chains. More globally, it is very rare for consumers of any seafood product to pay a price premium for sustainability. Even in Northern Europe and North America, it’s not clear that the MSC logo commands a substantial price premium outside of a few select markets (e.g. whitefish in Germany).

Market access has been a bigger driver in the MSC’s growth to date globally, but this review cannot currently identify a market that cares sufficiently about sustainability and is purchasing live reef fish. The hotel chains may serve as a natural starting point, but there are no available data on the market share they represent (as noted above), which presumably is insignificant. Moreover, given that there is no obvious source for better product, it will be difficult to harness the purchasing power of those companies.

Fishery Improvement Partnerships

*Can the Fishery Improvement Partnership approach be used to transform the LRFF? What are the limitations of this approach?*

Fishery Improvement Partnerships (FIPs) are a more promising approach than certification in the near term. FIPs are an emerging tool in the seafood world that involve NGOs partnering with major seafood buyers to promote a series of reforms in particular fisheries. The FIP approach is being used to good effect globally mainly by two organizations: WWF and Sustainable Fisheries Partnership (SFP). One could envision a scenario wherein major buyers of LRFF agreed to work with a particularly productive fishery and fishery managers in order to ensure a productive long-term supply.

However, there are several serious obstacles to this approach.

First, the starting point for formal FIPs is an MSC pre-assessment, which the reef fish fishery would fail. A pre-assessment would highlight several major shortcomings (lack of management, overfishing, destructive gear, etc.), but would not specify the necessary solutions. There may be some bright spots
in reef fishery management in Southeast Asia – possibly associated with new TURF-reserves or the Seascape initiatives – however, none of our interviews were able to point us to a well-managed reef fishery outside of Australia. A FIP can only be enacted if there is a solution towards which the FIP is working.

Second, there is no consolidated buyer power to pool in an FIP. To date, FIPs have worked best when the engaged players on the market side (e.g. major whitefish buyers like McDonalds, Unilever, Wal-Mart, Ahold, etc.) pool their purchasing power to influence a fishery. In the case of LRFF, buyers are extremely disaggregated rather than concentrated. Even if buyers were interested in CSR (which they are not), it is doubtful that there would be a large enough community to influence the overall direction of the trade. While a very small start may lead to longer term and wider success, the path will assuredly be a long one.

Third, the illegal trade would be a huge obstacle to any effort to reform the practices through a relatively structured legal approach.

Voluntary standards and best practices

*Can the promotion of voluntary standards be used to transform the LRFF? What are the limitations of this approach?*

In 2004, a draft standard for the LRFFT was released. The standard was developed in a commendable multi-stakeholder process. It covered both wild and farmed LRFF, as well as the trading activities, and was designed to lay out best practices with respect to sustainability, the rights of fishers, compliance, socioeconomics, and stakeholder participation. Despite the good work that has gone into the standards, it is unclear what its utility is. For the last five years “The standard has been lying around, gathering dust.” Fishermen and the industry have not taken up the standards – essentially “It’s a standard without a home. It’s an orphan.” The Voluntary Standards shouldn’t be thrown out or remade from scratch, but it is unclear who will ultimately own them or how they will need to be revised.

Relying on the promotion and adoption of a voluntary code of conduct to transform this trade has several serious shortfalls. Most pointedly, the “standard” is not currently a standard. It is a statement of principles rather than a set of actionable standards or criteria. It is relatively vague and aspirational, and certainly open to interpretation. Turning those principles into actionable standards would be a major undertaking. Currently, the standards do not have a home – no one “owns” them. Organizing a roundtable is the typical path to turn principles into actionable standards, and this is the approach that has been used with aquaculture, palm oil, sugar cane, beef, and other major commodities. However, there’s currently no firm commitment to this approach from either major producers or sellers. Pursuing a roundtable without industry engagement runs the risk of throwing a lavish party that no one attends.

Even if there were interest, a serious issue with the standard is that there is currently no product that would meet the bar. This creates an enormous supply challenge for those industry participants who would voluntarily participate. Currently there are no obvious good fisheries to promote (apart from Australia). At a minimum, most fisheries suffer from overfishing, the absence of fishery management plans, poor enforcement, open access, etc. Some also suffer from destructive fishing practices (cyanide) and the regular harvest and grow-out of undersize, or juvenile fish.
In lieu of a formal certification or multi-stakeholder standard development, one could try to promote better practices among important traders in the supply chain. WWF is currently working with one brave soul: a major Indonesian LRFF trader. The trader has set voluntary standards for the fish he takes at his consolidation sites including a minimum size limit, a prohibition on cyanide and trap caught fish, a prohibition on retention and sale of humphead wrasse, and a rotation system. He also subsidizes the use of larger hooks and artificial bait, pays a premium for LRFF, supports research, organizes his 4,000 fishermen into community fishing groups, and limits the number of fishermen that supply each cage. Moreover, violation of any of these standards, such as selling juveniles or humphead wrasse to other traders results in the fishermen being expelled from the fishing group and forgoing any of the benefits dispersed for adhering to agreed better practices.

Essentially, the trader has established a de facto fisheries management system. In return for his amazing efforts, the trader had anecdotally reported losing about 40% of his profits. The minimum size requirement and other prohibitions are difficult because there are other traders willing to buy the product. The altruism is commendable, but likely will not be a sufficient mechanism to change the fishery unless well-intentioned traders can be compensated for their efforts in order to protect their market share. It is unclear how NGOs such as WWF can help well-intentioned traders create value from their efforts.

The natural venue to think about broadening the application of these standards is through the Hong Kong Chamber of Seafood Merchants. This association represents the majority of the LRFFT through Hong Kong. If the Chamber collectively adopted a series of minimum standards (e.g. minimum size standards, a prohibition on cyanide use, etc.) it might have some sway. However, traders are still free to operate outside of the Chamber and it has not been determined whether the chamber has the authority or influence to be able to stop bad practices.

One change to the fishery management system that might transform this dynamic is if traders were able to buy or sell exclusive sourcing rights for a particular geography: essentially a TURF system for traders. The target species are mainly sedentary with small home ranges and therefore able to be “managed” under a TURF type system. For example, one might envision a system wherein a trader was given the rights to procure all the fish from a large area. That access right would allow the trader to set up decision rules about what size fish he would purchase, when, etc., and to enact measures that might maximize long-term productivity. However, creating and enforcing that system would require a fundamental change in national and sub-national fishery management, as well as an effort to limit illegal trade. Moreover, it would create serious potential for the abuse of fishermen dependent on one monopolistic buyer.

Ironically, the place where the Voluntary Standard is likely to prove most valuable is in shaping future regulations. Both Papua New Guinea and the Solomon Islands looked at the voluntary standard in developing their fisheries management plans, and Malaysia referred to it as well. In this vein, the Voluntary Standard is serving more as a guidepost for fishery management rather than an effective market-based instrument, though it may ultimately evolve into a market tool in the future. As one reviewer noted, many LRFF exporting countries do not have great expertise in fisheries management planning, which is one reason why the voluntary standards may have been used as guidelines. Source country management of these resources is essential and a long-term goal should be to increase that management capacity.
Payments for Ecosystem Services (PES)

Are there any sorts of PES options that may present themselves as ways of reducing capacity, effort etc.?  

In short, there are none to date. PES has received considerable interest since Constanza et al. estimated their global value in Nature in 1997. However, in practice, the application of PES is essentially non-existent in the marine environment. One of the few groups focused on marine PES is the Marine Ecosystem Services (MARES) program at Forest Trends (http://www.forest-trends.org/program.php?id=136). MARES reviewed the world of existing and potential marine PES and identified four categories of PES with some promise in the marine environment: water quality protection, fishery nursery habitat protection, coastline and beach stabilization, and biodiversity payments – specifically species banking or biodiversity offsets. Of these, only the voluntary biodiversity payment approach is applicable to the LRFF.

Linking the biodiversity offset market to the LRFF is a longshot at best. Voluntary biodiversity offset markets are emerging, but the extractive industries that are buying these offsets are interested in protection similar habitats to where they are operating, not tropical reefs. If there were interest in protecting reefs, the more likely model would be to fund the establishment of permanently closed areas rather than to fund fisheries management. The dilemma is that the markets find even the most remote fisheries if they want the fish, but it may be harder to link the PES to the remote fisheries. Regardless, the funding for biodiversity markets is not likely to come from the LRFFT supply chain. Any hypothetical PES payments would need to be linked to fisheries management in order to ensure the protection of the PES. One might envision a scenario where a hotel resort or the tourism bureau paid for the establishment of a local protected area (e.g. around Misool in eastern Indonesia), but there are already hundreds of protected areas in the region, such that one can say with confidence that the establishment of a handful of protected areas is not sufficient as a regional solution. Reducing capacity requires limited entry provisions, which can either be done in a top-down or bottom-up system. It is not going to come from the supply chain unless fishery managers allowed traders/buyers exclusive access rights for specific regions.

Theoretically, fishermen could be paid to improve the sustainability of the LRFFT. It stands to reason that the money needs to come from somewhere. Sources could include taxes and fees on LRFF, conservation payments from other governments or multilaterals, or philanthropy. But currently no such funds are foreseeable on the horizon.

2. Consumer engagement: efforts to reduce demand for LRFF or to increase consumer demand for better products (e.g. consumer education or corporate buyer engagement)

What is the potential to substantially reduce or shift the demand toward better LRFF in the relevant markets?

A second set of initiatives involves trying to reduce the demand for LRFF (or stimulate the demand for better LRFF) by working directly with individual or corporate consumers.

There are really two different audiences for this kind of work:
LRFFT – SUPPLY CHAIN AND MARKET INTERVENTION ANALYSIS

- Consumers: Consumer education through seafood cards, media campaigns, celebrity chef outreach, celebrity leadership (e.g., Jackie Chan), public events, and other pathways targeting the individual consumer.
- Major buyers: Aggressive outreach, pressure campaigns, media engagement, partnership cultivation, and technical support for major buyers.

This set of strategies has been used to good effect in both North America and Europe, where several million seafood card (red-yellow-green guides) are handed out each year, where retailers are ranked and aggressively targeted on the basis of their seafood procurement policies, and where the majority of the retail sector is now engaged in some form of partnership with the NGO community.

In the case of LRFF, the relevant audiences are individual consumers in Hong Kong and mainland China, particularly in the Pearl River Delta and the restaurants and restaurant chains that serve LRFF. Secondary targets might include traders, wholesalers, or distributors in the supply chain. There is a need to start somewhere, and the most logical place is probably Hong Kong, potentially using humphead wrasse as the poster child for the broader problem. The Seafood Summit will be hosted in Hong Kong in 2012, and may be the seed for future work in Asia. There may also be cases where LRFF are caught in tandem with fresh/frozen grouper that is ultimately sold into more receptive markets (e.g. N. America or northern Europe). Under such a scenario, these receptive markets might be used to catalyze change.

Any effort to substantially change the nature of this demand is going to be a really long row to hoe. In the foreseeable future, it will be difficult if not impossible to reduce demand for LRFF to the point that it substantially reduces fishing pressure on the water. As previously noted:

1) The sustainable food movement in Hong Kong and mainland China is at least a decade behind other parts of the world. A good proxy for this is the very limited market penetration of organic food, FSC-certified timber, MSC-certified fish, fair trade coffee, and other ecolabeled product. Sustainable seafood is not a concept with traction yet. Even in North America, only a fraction of consumers actively vote their conscience with their wallet. The growing eco-consciousness in China will also be fighting against a massive market expansion embodied by the increase in the nouveau riche, who are more likely to purchase LRFF than others.

2) Awareness of “sustainable seafood” will need to be built from near scratch. WWF is starting that work now in Hong Kong through consumer seafood cards, for example. There are already some restaurants and businesses in Hong Kong that do care about sustainability. Progress has been made in awareness through the shark fin campaigns, which can be built on, though he LRFF is not as viscerally gripping as the shark fin issue. Awareness building work is important, but even if it succeeds it will not crimp demand. Market campaigns in the U.S. around farmed salmon, Chilean sea bass, shrimp, were relatively successful, but haven’t dented consumption despite a decade of work. In Hong Kong and China, the market is less receptive to the eco-sustainability message, and has not been primed with 15 years of campaigning.

3) The particulars of LRFF make it perhaps more difficult to influence. As a status symbol the consumption of LRFF commands a price well above its protein value. Like shark fin soup, it will be difficult to fight against the cultural tide. However, even if the price of LRFF fell substantially, fishing pressure is relatively price inelastic at current price levels. I.e. it might continue to occur at nearly the same rate. In the face of falling prices, there are some instances where fishing pressure may actually temporarily intensify in order to maintain overall yields.
Seafood cards, media outreach, and celebrity chef campaigns are a start. But that work couldn’t and shouldn’t be limited to LRFF – arguably it would need to address the broader portfolio of seafood sustainability. Moreover, to effectively reduce demand for LRFF, there would need to be a fundamental sea change in consumer attitudes, with LRFF transitioning from status symbol to pariah. This occasionally happens in the context of food safety, and occasionally around environmental issues (e.g. in the Pacific islands, outside attitudes have moderated the local attitude to the macho of eating sea turtles), but tectonic shifts in the sustainability world are rare and require substantial investments.

With respect to targeting corporate actors or major buyers, the challenges are nearly as large. As discussed, the most likely companies to address LRFF are the large hotel chains, such as Marriott, which already have an internal, international position on sustainable seafood. Apart from Marriott, there are no major corporate commitments in Hong Kong or mainland China around seafood. CI is working to get an agreement around shark fin soup, which may be something that the LRFF effort can build off of. However, the fact that 90% of the LRFF trade ends up in restaurants indicates that even a series of major corporate commitments would only touch on a small piece of the trade. There are far too many points of sale to target individually. Individual restaurants don’t have valuable corporate brands to protect from campaigners in fish suits. The NGO community does not have any capacity in Hong Kong or China to aggressively go after different restaurants. The consumers don’t clearly care enough to make a campaign a credible threat. At this point, there is no clear entry point for targeting companies that sell LRFF. And for every company that agrees to avoid problematic LRFF, there will be another company in another city eager to purchase it.

3. Substitution: efforts to promote alternative products (e.g. promoting aquaculture of LRFF in order to reduce price escalation and facilitate action by the supply chain)

*Can the promotion of responsible, full-cycle grouper mariculture help us achieve our objectives around improving the LRFFT?*

Promoting the responsible full-cycle mariculture of LRFF may be an important tactic in this campaign. The logical premise is that a growing supply of farmed produce can act as a substitute in the market, effectively increasing the price elasticity of demand for wild products. Why buy a wild tiger grouper for $100 when you can buy a farmed tiger grouper for $50? It also creates alternatives for the supply chain, enhancing their ability to reject bad products. In particular, if the NGO community could somehow encourage the development of full cycle mariculture in premium species such as coral trout and humphead wrasse where farming technologies do not yet exist, it might reduce demand for wild products.

This approach, while it may be an important supporting tactic, is unlikely to generate direct positive change on its own for several reasons.

First, increasing the supply of farmed fish does not necessarily reduce demand for wild LRFF. The two products are already treated differently by the market (e.g. Hong Kong consumers significantly prefer wild fish over farmed fish). More importantly, the prestige status associated with wild reef fish and the fact that it is a luxury item may mean that demand remains relatively price inelastic, particularly during the New Year. As such, there is no evidence to suggest that efforts will be able to more than
marginally reduce prices. The overarching dynamic with a growing demand and shrinking supply is only going to reinforce this dynamic in the future, with prices for wild-caught product likely to rise despite the upward trajectory of farmed fish. The concern has even been raised that growing farmed product will only whet the appetite of new consumers for wild product.

Second, even if interventions succeed at capping the escalation in prices, this will not necessarily translate to any substantial reduction in fishing effort for wild fish. Recent experiences with the growth of the shrimp and salmon farming industry tell a similar story. Farmed shrimp and salmon now represent more than half of their respective markets, and the prices for shrimp and salmon have adjusted accordingly. However, fishing effort for wild shrimp and salmon appears to have continued unabated and in some cases the wild commodities (e.g. Alaskan king salmon or large wild prawns) still command a price premium in the market. Today, there is more farmed grouper in the LRFF market than wild product – possibly two times as much. However, no one is claiming that the fishing pressure on wild stocks has fallen.

A third factor to consider with respect to aquaculture is that when one compares grouper farming (particularly cage grow-out) to other sectors of the global aquaculture industry, farmed grouper is among the worst environmental performers. It is the segment of the industry that aquaculture advocates would like to curtail entirely; the reddest of the red. This is due to feed inefficiency, cage farming effluent and habitat impacts, potential for disease transfer, etc. As a result, it would require a very nuanced position for environmental groups to promote grouper farming as a means to indirectly reduce pressure on wild stocks. If one were focused solely on the environmental effects of aquaculture, one might promote better grouper farming practices. But in effect this would mean trying to curtail the growth of bad farming practices, or limiting the growth of grouper aquaculture, which would presumably only exacerbate the pressure on wild populations.

The last factor to consider in the aquaculture discussion is that the environmental community has not yet demonstrated any means to successfully promote aquaculture. The industry is growing rapidly of its own accord, driven by market demand and technological improvements. It is unclear what the NGO community could do to further promote it. Our ability to improve aquaculture practices (i.e. via the Aquaculture Stewardship Council or WWF Aquaculture Dialogues) will depend on market engagement – the same market advocates are trying to engage on wild fisheries. In that vein, the discussion around aquaculture practices is likely to be something of a distraction. The growth of grouper farming may prove to be important strategically and politically – as a means of assuring alternative supplies for key actors in the supply chain, which facilitates their engagement – but there is not an obvious market failure to address or policy advocacy role that the NGO community should take on.

4. Trade interventions: efforts to better restrict or better regulate aspects of the trade of LRFF (e.g. tariffs, bans, and trade regulations)

Are there viable trade-based interventions that can improve LRFF practices?

While international trade policy was somewhat outside the purview of this analysis, it ought to be included in any discussion of strategies that influence the LRFF market. Currently, any effort to improve the market for LRFF is going to be undermined by illegal trade. This makes IUU a natural
place to focus. Moreover, focusing on “don’t sell illegal fish” is an easier message to deliver to traders, restaurants, and others, than “sell sustainable fish.”

None of the available literature or workshop proceedings focused in depth on trade based approaches. As such, this review is unable to comment on the relative likelihood or degree of difficulty associated with these approaches, which merits greater investigation. What is most needed is a political discussion about how to deal with Chinese and Hong Kong demand and managing that demand in the future. That conversation ought to involve a different look on the regional arrangement, possibly looking at ASEAN as an entry point. For example, one could potentially incorporate illegal LRFFT into the SEA Regional Program of Action on IUU.

Trade interventions can be split into two types of approaches:

1. **Improving existing systems to help stem the illegal trade of LRFF**
2. **Creating new trade measures to substantially restrict the flow of LRFF**

Possible strategies under each are explored below.

1. **Improving existing systems to help stem the illegal trade of LRFF**

There are a handful of measures that could be taken to improve the implementation of existing laws and regulations. These steps could help to squeeze the illegal trade of LRFF, improving efforts to enforce laws in source countries.

- **Fix the Hong Kong imports loophole** – Historically, any LRFF landed by Hong Kong fishing vessel in Hong Kong have not been classified as imports or food. This is believed to be the primary route for IUU fish. Importers do not pay tariffs on the product, and there are no claim forms to file. As a consequence, there is very shaky data available on this product. Given Hong Kong’s growing attention towards sustainability (e.g. banning trawling in its waters), there should be a policy campaign to classify landings of LRFF by fishing vessel as food, and to treat these imports in the same fashion as landings of LRFF by air. WWF Hong Kong with support from WWF’s Coral Triangle Program has already identified this as a goal for this year. The passage of the new Food Safety Ordinance earlier this year may have successfully closed this loophole.

- **Link import data with export data** – To help reduce IUU, Hong Kong should share import country-of-origin data with the relevant government agencies in source countries. This could involve requiring there to be an exporter-of-record for any imports, in order to help stem unreported trade. This will not be a cure-all for the trade, as creative importers will presumably be able to route product through source countries that turn a blind eye to the issues, but it would certainly add an additional layer of accountability.

- **Control vessel-based imports** – Hong Kong should consider creating a special public vessel registry for LRFFT vessels. This would allow exporting countries to black-list vessels involved in IUU, and for reviewers of the trade to better track the flow of product through vessels. A second approach would be to suggest an air-only trade of LRFF between source countries and end markets, or to employ designated export hubs.

- **Track Hong Kong export data** – Currently, Hong Kong does not effectively track re-exports of LRFF to mainland China. As a consequence, using anecdotal evidence and small sample sizes, experts can only speculate that half or more of the Hong Kong product is shipped to the
mainland. The current law requires export data to be collected, but these laws are not enforced. The export data is mainly useful in better tracking the flow of products.

- **Improve granularity of Chinese import data** – Encourage China to develop better data tracking on imports, primarily to discourage the illegal trade from skipping Hong Kong and being routed directly to China. Currently, China collects import data, but not at the level of granularity that it is useful in tracking the flow of the LRFFT. The encouragement might involve a campaign emphasizing the ecological impacts of the LRFFT and the powerful role the Chinese market plays in it.

- **Implementation of CITES II by China** – China is not currently implementing CITES Appendix II for marine species. This massive loophole must be improved for all marine species. Humphead wrasse is a CITES listed fish, and should be an important test case for the other LRFF. If analysts are unable to track these through international markets, they are unlikely to be able to track other LRFF. Work by Yvonne Sadovy is focused on improving the implementation of CITES with respect to wrasse and should continue.

This assessment lacks a detailed institutional analysis of the situation within China, both in general with respect to natural resources sustainability, trade and investment, and sustainable development generally. And specifically, there is not institutional analysis of the various elements concerning the management of fisheries and aquaculture, or of trade in these commodities. There is a strong interest in promoting better environment and development on the part of central government and various provinces in China. These are important points because the Chinese government should have an expanded role in trying to bring problems such as the illegal fisheries trade under control, and influencing consumer and trader behavior, and stimulating sustainable aquaculture solutions.

2. **Creating new trade measures to substantially restrict the flow of LRFF**

In addition to the laws already on the books, there are a series of new trade-related policies that could be taken to help control the LRFFT. These include:

- **Create a requirement for air-only transportation of LRFF** – The general consensus is that most of the illegal trade occurs via carrier vessels (modified fishing vessels). A multi-lateral agreement to only accept wild LRFF transports via air could significantly reduce IUU. Even in lieu of that requirement, there is the potential to pressure international air carriers to carry proper documentation for their fish, and not carry fish from non-complying states. An estimated two-thirds of imports into Hong Kong already come by air. The majority of this product is shipped on commercial airlines (e.g. Cathay Pacific, Singapore Air) that are arguably the only links of the supply chain with any brand vulnerability. According to one NGO professional, the airlines are interested in cooperating on LRFFT issues, especially around humphead wrasse. If a business-to-business platform around trade is created, effort should be taken to include the Airlines. At a minimum, airlines should be documenting and reporting the trade. Poor customs and quarantine efforts can mean that while documentation may seem to be in order it is erroneous. However, air carriers will be easier to regulate than smaller vessels, and have more incentive to cooperate.

- **Export quotas** – There are already LRFF export quotas in place for humphead wrasse in some countries, as well as a regional export quota proposed in Palawan. These quotas are currently poorly enforced due to IUU. Having more countries or regions establish export quotas is a viable approach if IUU trade can be controlled (see measures listed above) and the domestic market can be limited.
• **Import and export tariffs** – While the trade may be relatively price inelastic, increasing the cost of the fish to consumer may still dampen interest in LRFF. A tariff is also a mechanism to increase the interest of the relevant authorities in the trade, as well as a potential source of revenue for better management. A multi-lateral agreement to tax the trade of LRFF and to dedicate those funds to the management of the resources would be a huge boon to LRFF fisheries.

• **Improved traceability systems** – Taiwan has enacted a traceability system for LRFF that involves tail collars for the fish, giving consumers and others the ability to electronically track the fish back to their source. That system is relatively expensive, government subsidized, and more suited to aquaculture than it is to wild production. However, tracking prices will eventually drop, and one could envision a requirement for fish to have at least a paper trail back to their country of origin. Linking LRFF with food security would be a more powerful driver.

• **Lacey Act equivalent in Hong Kong or China** – There are several laws relating to agricultural products in the US and EU that prohibit the sale of illegal product. The United States has the Lacey Act which prohibits the sale of product that was illegally produced in the country of origin. Similarly, the EU has a prohibition on illegal timber and more recently on IUU fish. In the case of the Lacey Act, it also holds actors in the middle of the supply chain legally accountable. This transfer of liability is important in that it creates a strong incentive for those in the middle of the supply chain to look closely at the source of their product. The application to fresh/frozen grouper imports might apply pressure to associated live reef fisheries as well.

• **Trade bans and Moratoriums** – As the situation on LRFF situation deteriorates, and reefs become further stressed by climatic changes, it begs the question whether there should be international trade around these threatened resources. Like ivory or tigers, it’s possible that in the future a moratorium or ban on trade in certain species (i.e. humphead wrasse) could be enforced or that trade should be restricted to farmed product.

While the suite of trade-related interventions is promising, they also come with their own set of herculean challenges. First and foremost, trade is a very sensitive political issue and LRFF is a relatively niche product. In countries such as China, where trade volumes are comparatively small, LRFF is likely to play second, or third, fiddle to other commodities. Tariffs are unlikely to be implemented and run counter to the trend toward trade liberalization promoted by organizations such as ASEAN and APEC. And even if these interventions succeed, restricting trade may simply encourage greater in-country consumption. As a case in point, Malaysia has prohibited the international trade of humphead wrasse. Instead, it’s now actively marketing itself as a seafood Mecca, encouraging international travelers to come to Malaysia and partake in its seafood cornucopia! The out-of-country LRFF market may be replaced by the in-country LRFF market, which may in turn be replaced by the fresh fish market.

There simply is no silver bullet to fixing the LRFFT. The simple truth is that LRFF fisheries are being hammered. They need to be managed. Philanthropy can try to dampen demand in order to slow the hemorrhaging, or it can apply market pressure to support improved management, but the market will never be an effective substitute for effective fishery management, whether that is community based or government led.

LRFF are an iconic group of species, like pandas or tigers, and success with LRFF may have spillover effects. But failure can have unintended consequences as well. Given the difficulty of doing
something to make the LRFFT more sustainable, conservation groups and philanthropists each need to weigh the pros and cons of where best to focus their efforts. The review was intended to promote a better-informed discussion in the future.
Appendix – LRFF supply chain analysis

See attached Powerpoint: *CEA LRFFT Supply Chain March 2011*