MOSTLY LEGAL, BUT NOT SUSTAINABLE

HOW AIRLINES CAN SUPPORT SUSTAINABLE TRADE IN LIVE REEF FOOD FISH

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Acknowledgements
This report was prepared by ADM Capital Foundation with the financial support of HKIA Environmental Fund. ADM Capital Foundation would like to thank and acknowledge the contribution of the authors whose joint and unique expertise made the report possible, namely Dr. Geoffrey Muldoon (WWF Australia), Professor Yvonne Sadovy (School of Biological Sciences and Swire Institute of Marine Science, University of Hong Kong, Science and Conservation of Fish Aggregations), Stan Shea (BLOOM), Isabel Tam (Barrister), Dr. Richard Welford (CSR Asia) and Amanda Whitfort (Barrister).

We would also like to thank Sophie le Clue (ADM Capital Foundation) and Doug Woodring (Ocean Recovery Alliance) for editing the report as well as their overall management and co-ordination of the project and Amy Woo (DESIGNORM) for her innovative infographics.

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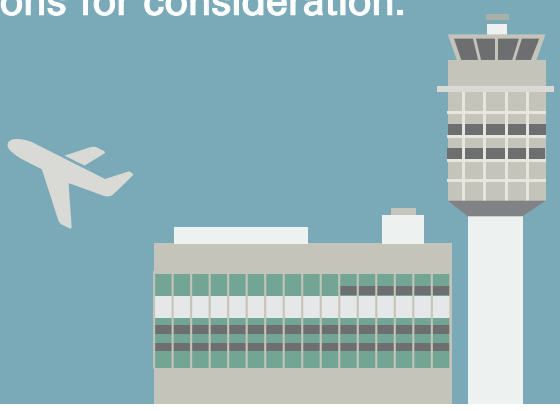
Any opinions, findings, conclusions or recommendations expressed in this material do not necessarily reflect the views of the Airport Authority Hong Kong.

October 2015

The Hong Kong International Airport (HKIA) has publicly committed to being the world's greenest airport[1]; a commitment that is the first of its kind in the industry. As part of this commitment, and in light of growing international concern over the Live Reef Food Fish Trade (LRFFT), in November 2013 the Airport Authority Hong Kong (AAHK) commissioned a study of the LRFFT and its implications as regards both HKIA's own corporate responsibility commitments and that of its business partners such as airlines.

Air carriers play a crucial role in the LRFFT as the predominant transport mode for live seafood brought into Hong Kong. Between 2002 and 2013, they accounted for approximately 61% of all recorded live fish imports and 50% of the high value/most threatened species. While relatively small in volume at about 13,000mt annually, the LRFFT has an estimated retail value in excess of US$ 1 billion, when averaged over the last three years.

This document presents an overview of the LRFFT along with a summary of the related environmental and social concerns. The nature of the supply chain is explored in terms of the role of its actors, with a particular focus on the transportation sector. The report concludes with a focus on opportunities for the aviation industry and its allied service providers with recommendations for consideration.



LIVE REEF FOOD FISH TRADE: VOLUME VS VALUE

Volume vs Value

2003-2013 (average annually)

1

BACKGROUND:

LIVE REEF FOOD FISH TRADE (LRFFT) – PART OF THE INTERNATIONAL WILDLIFE TRADE

Unprecedented growth in the international wildlife trade is set to compromise the reputation of policy makers' port/airport operators and carriers

Hong Kong's tariff-free status, its proximity to China and its strong, extensive and long-standing trade networks in the region have facilitated a burgeoning legal and illegal wildlife, not least of which is the LRFFT. The unprecedented and ongoing rise in wildlife trades including the LRFFT, is not only threatening the survival of an increasing number of species, but it set to compromise the reputation of policy makers in major demand and/or trade centers, along with those who facilitate it, including port/airport operators, carriers and retail outlets.

Not surprisingly, the issue of the illegal wildlife trade is increasingly a priority of national governments, both in the source countries and those countries that import/re-export these species, due to their international obligations such as under the Convention on Trade in Endangered Species (CITES). NGOs with both global and local reach are also increasingly vocal on this issue buoyed by public sentiment that is moving in favor of greater species protection, trade transparency and oversight.

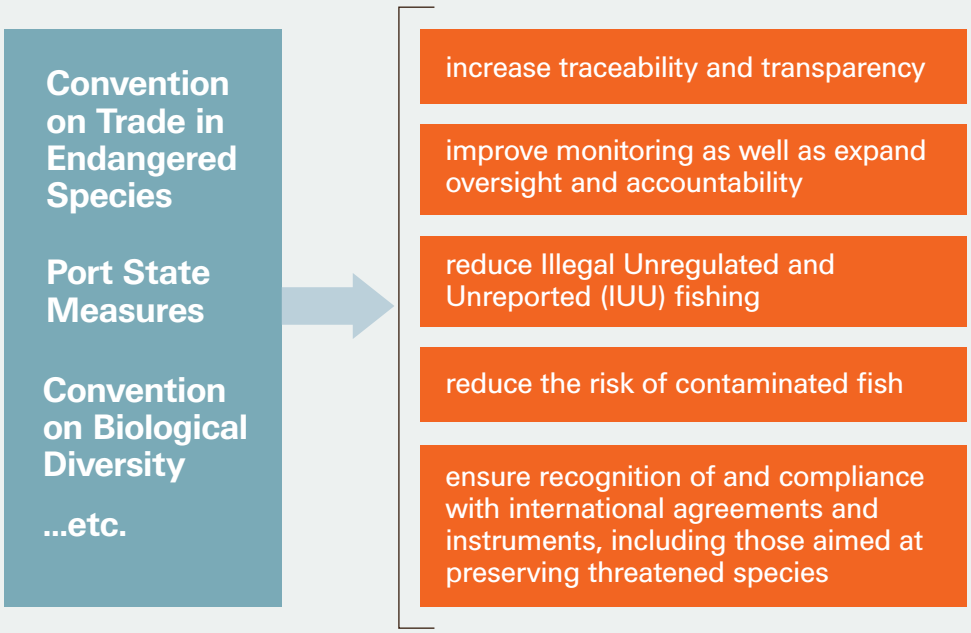
Due to rising demand in Hong Kong and China, the LRFFT is thriving

Unfortunately, the LRFFT as currently practiced is largely reliant on sourcing from unmanaged and poorly regulated fisheries throughout Southeast Asia. As a result, in many places it is biologically unsustainable and ecologically damaging. Several of the most highly valued species traded are threatened or near-threatened with extinction if trends continue and many of them are inherently vulnerable to overfishing. Related concerns arise over the implications for food security in the mostly 'developing' source countries.

The issue then is not one purely of illegal trade, but also of trade that is legal but unsustainable. While Hong Kong is a signatory to the Convention on International Trade in Endangered Species (CITES), local obligations to regulate the trade in Live Reef Fishes apply to just the Humphead Wrasse under the Protection of Endangered Species of Animals and Plants Ordinance, Cap. 586. Hong Kong does not currently have any legislation to regulate the trade of other species that are threathened, as some of the most popular LRFF species are.

However Hong Kong is now a signatory to the Convention on Biological Diversity and regional impacts such as those related to Hong Kong's Live Reef Food Fish Trade are of direct relevance to future policy making in this regard.

GROWING NATIONAL AND INTERNATIONAL ACTIONS



Globally the term Illegal, Unregulated and Unreported (IUU) fishing has been adopted to encapsulate a worldwide problem whereby fish are captured from unmanaged fisheries for example, without or in violation of quotas and where catches are under and /or misreported in contravention of local laws and regulations. Live Reef Food Fish Fishes are for the most part both sourced from such unmanaged fisheries and unreported.

In addition, Live Reef Fishes landed by Hong Kong Registered Vessels (HKRV) are excluded from the requirement to submit customs import declarations, a legislative loophole that faciliates the import of CITES listed species with little or no scrutiny.

In many places the LRFFT is biologically unsustainable

As regards concerns over sustainability of the seafood trade globally, there are growing national and international moves to address the issue[2]. At the same time, the global movement towards making the international wildlife trade, including the trade in marine species, more environmentally responsible, its facilitators, such as major upstream beneficiaries of the LRFFT, are becoming more exposed to business-related risks, without necessarily becoming more informed and engaged. Addressing the issue now will enable stakeholders to plan for future trends, public pressure and statutory requirements as responsibility and accountability for more sustainable trade operations become the norm.

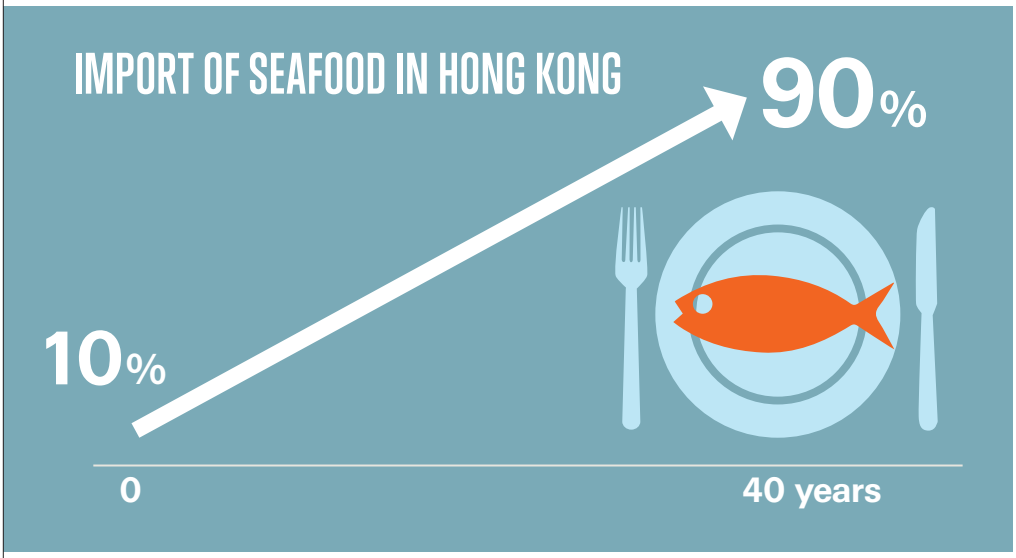
2

HONG KONG

A WILDLIFE TRADE HOTSPOT

Despite its small size, Hong Kong plays an important role in the international economy as a trade hub

As an international trade hub and gateway to China, Hong Kong plays an important and unique role in the international economy. A role that has implications well beyond its borders and more far-reaching significance than the city's relatively small size might suggest. Hong Kong International Airport and Hong Kong's container port facilities are amongst the easiest to use, as well as the busiest in the world, due in part to the City's 'free trade' policy. Hong Kong's flagship carrier Cathay Pacific is notably the world's largest international air cargo carrier[3].



Having depleted its own marine resources, Hong Kong currently imports 90% of its seafood

The most extensively traded of all food commodities globally is seafood. Globalization of this industry directly benefits Hong Kong not just as a trade hub but as an economy that has moved from depending on imports for only 10% of its seafood consumption needs, to 90%. This is the combined result of over-exploitation, collapse in its domestic fisheries and increasing consumer demand.

Hong Kong is the destination for the vast majority of all LRFF traded globally

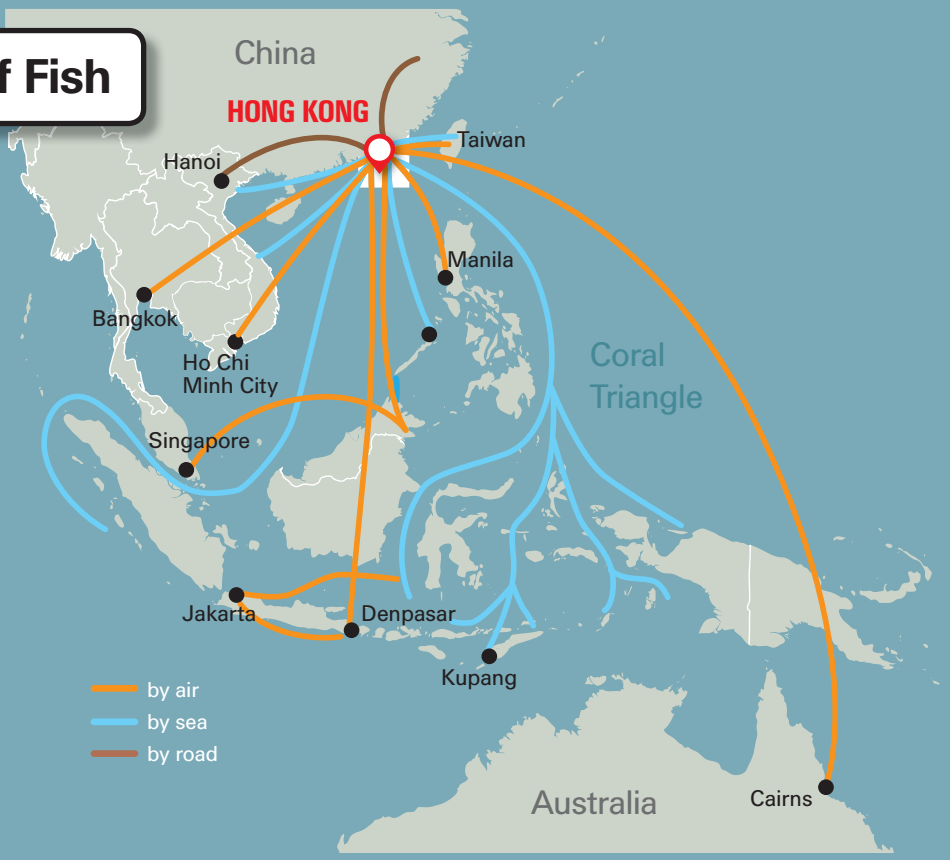
The LRFFT is a clear example of that evolution and trend, with Hong Kong the destination for the vast majority of all LRFF traded globally; almost all of it imported from developing countries in the Asia-Pacific. While large quantities of seafood are imported and consumed in the city, a significant but largely unregulated and unmonitored proportion is also re-exported illegally to China. This is evidenced by retail sale of HHW across the border far in excess of the number of permits, prosecutions in Hong Kong, as well as trader interviews confirming routes through Hong Kong and the practice of avoiding customs declarations.

HONG KONG WILDLIFE TRADE FOOTPRINT – EXAMPLES

Hotspots[4] where wildlife trade is rife, and which act as major demand/trade hubs, are of mounting global interest; these include China's international borders and in particular Hong Kong and its role as an entrêpot port.

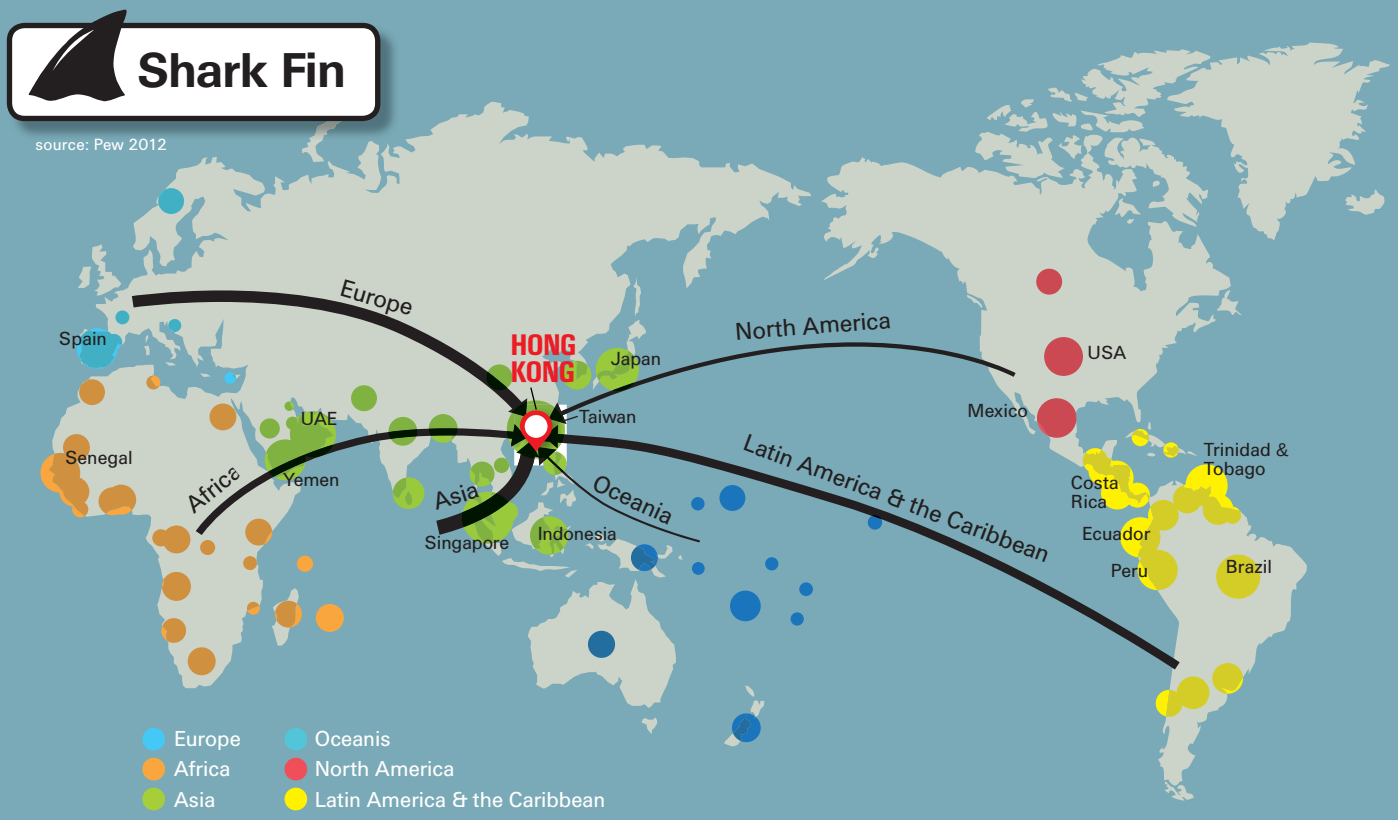
Live Reef Fish

source: WWF 2011

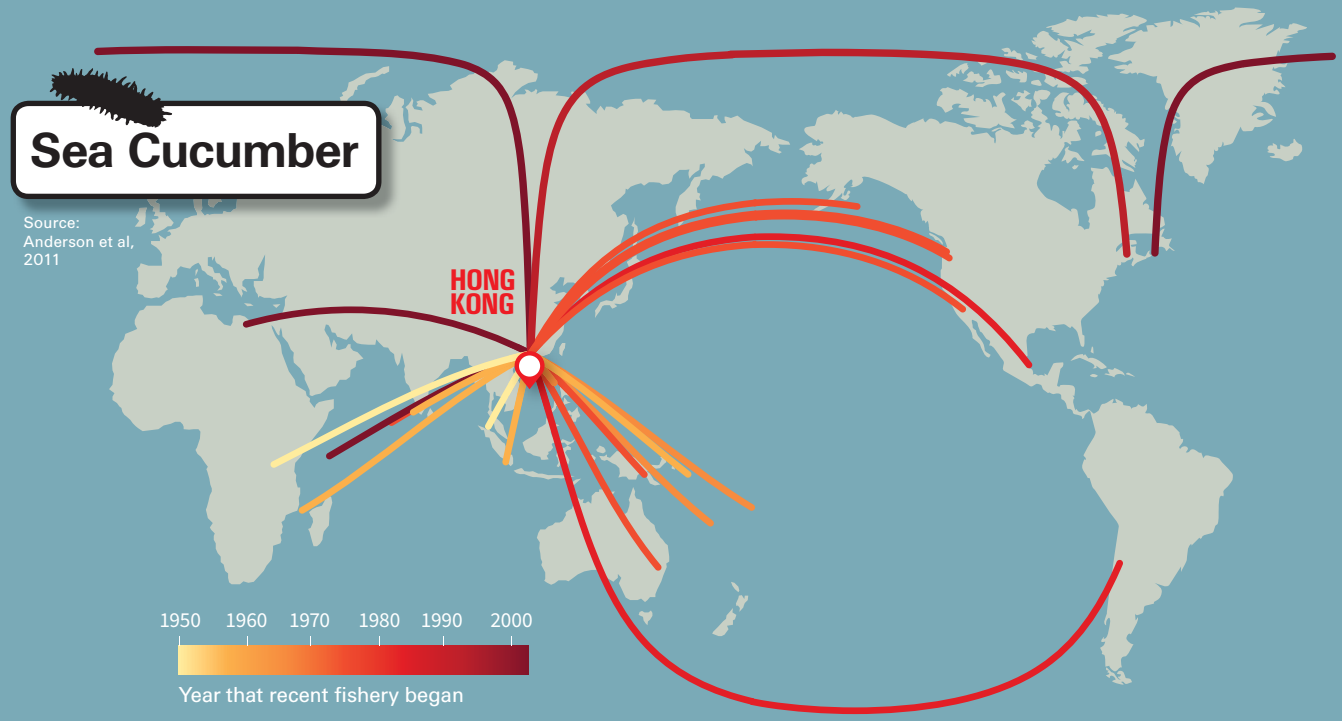


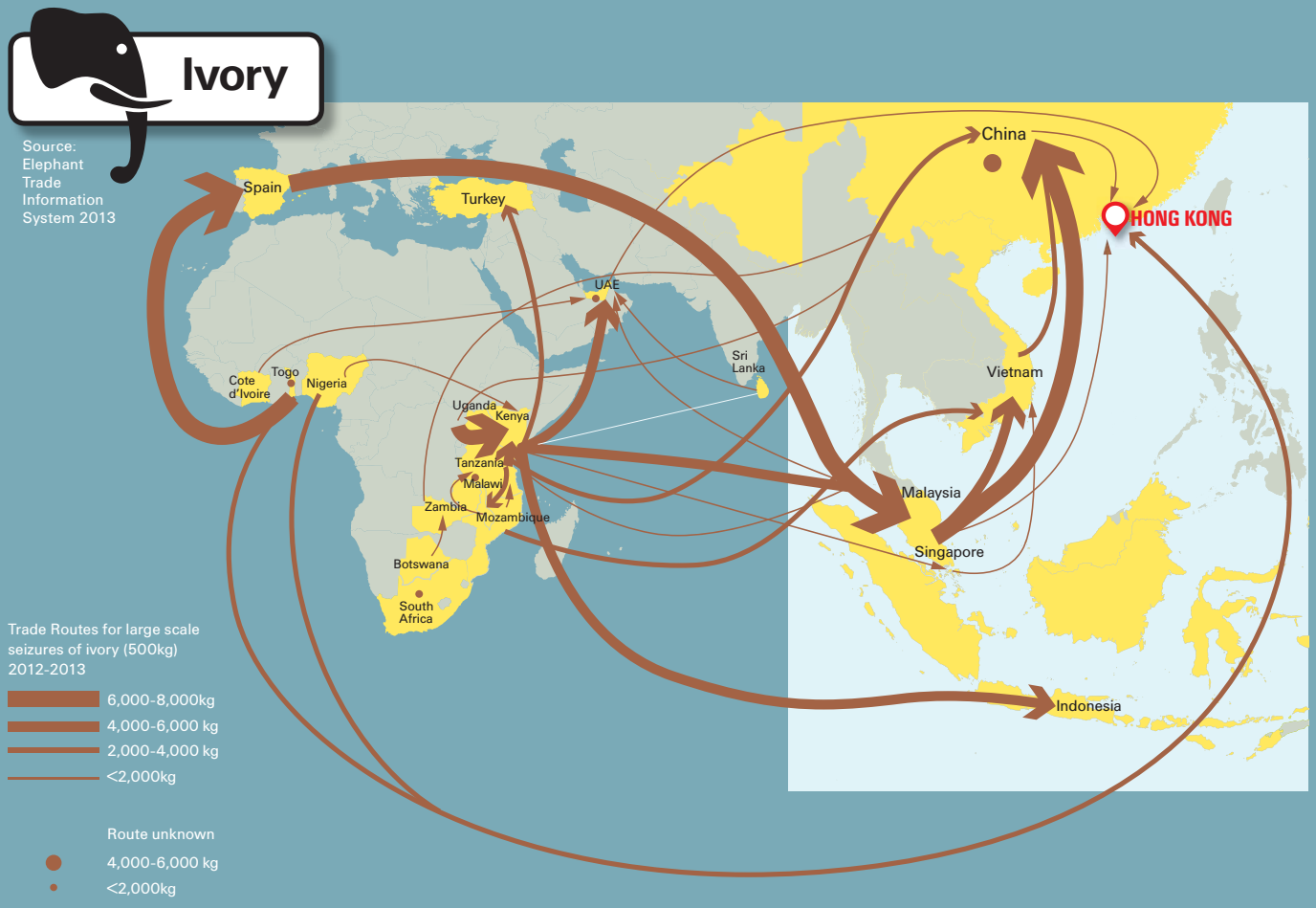
Shark Fin

source: Pew 2012



HONG KONG WILDLIFE TRADE FOOTPRINT – EXAMPLES





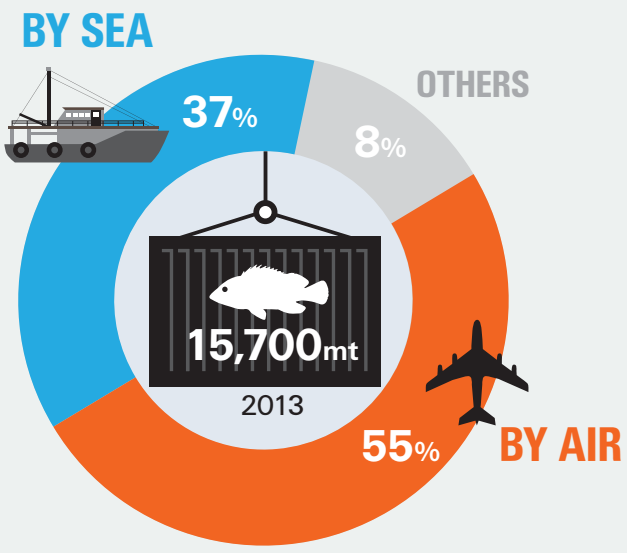
3

ANATOMY OF
THE LIVE REEF FOOD FISH TRADE

In 2013, the volume of LRFF imported into Hong Kong reached the highest ever recorded

Rising Trade Volumes

As well as being its primary trade hub, Hong Kong is regarded as the most reliable repository for LRFF trade data despite it being acknowleged that these data likely under report the extent of the trade. In 2013, according to HKSAR Government Census and Statistics Department (CSD) data, the volume of LRFF bought into Hong Kong by air and sea reached the highest ever recorded over a fifteen year study period at over 15,700 mt.



Sourced from unregulated and unmanaged fisheries

Just 10% of global fish stocks can withstand higher fishing pressure

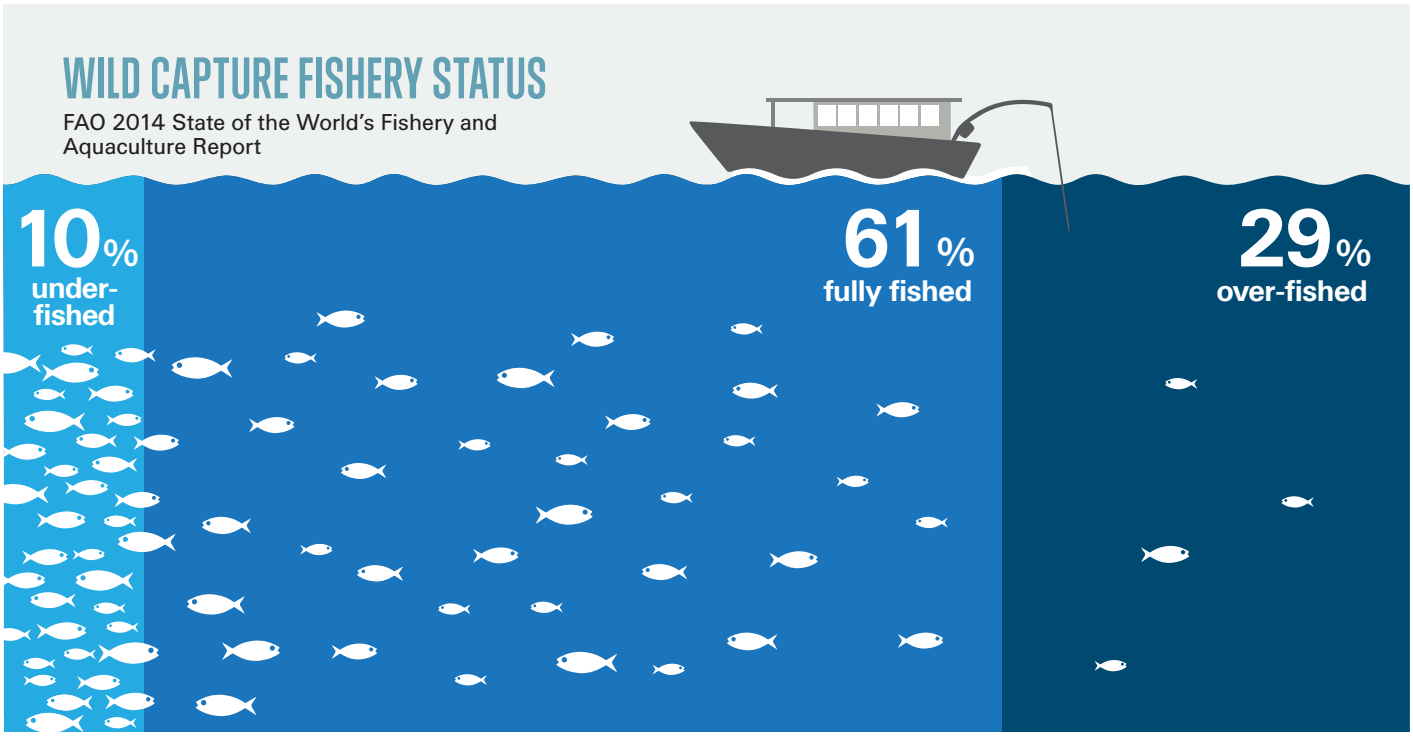
Marine ecosystems support more than 660 million jobs globally and are a significant source of protein and livelihoods, particularly in developing countries. However, it is estimated that just 10% of global fish stocks (for which there is information) can withstand higher fishing pressure. The rest are either fully exploited i.e. can withstand no further fishing, or are already overexploited i.e. need management and reduced fishing activity to avoid further population declines[5].

Live reef fishes are primarily sourced from largely unregulated and unquantified fisheries

Unfortunately, live reef fishes are primarily sourced from largely unregulated and unquantified fisheries in the Indo-Pacific region, particularly South East Asia. Indeed, there is also considerable concern that the small-scale fisheries supplying LRFFT are among the most overexploited and least understood of all coastal fisheries globally.

Many live reef fish species are inherently vulnerable to overfishing

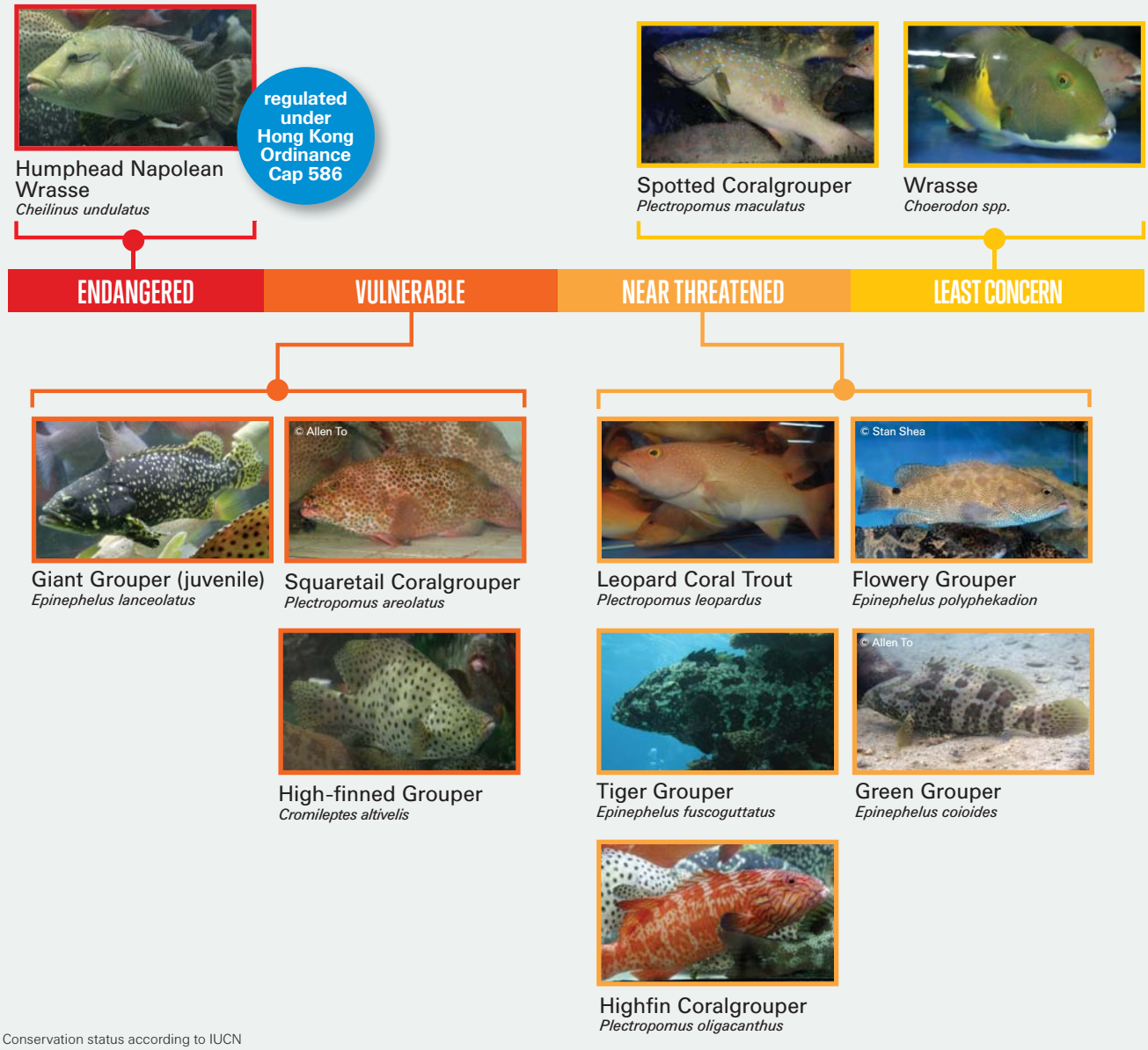
The LRFFT depends on a range of reef fish species including groupers, wrasses, parrotfishes, snappers, pompanos, moray eels, emperors, stonefishes and sweetlips which are traded alive and for the most part regionally. Some species, such as certain groupers and wrasses are particularly vulnerable to overfishing because of their biology e.g. late sexual maturity, longevity, habit of aggregating to spawn and changing sex, reinforcing the urgent need for better management and control over their commercial exploitation.



Most species are captured from the wild, though mariculture is increasing

Most species in the LRFFT are wild-caught, though an increasing proportion by weight, albeit from a small number of species, is being produced through mariculture i.e. the aquaculture of marine species. Mariculture, however, has its own set of sustainability issues (as noted below) and will also need to be practiced sustainably to meet increasing demand to avoid further pressure on wild populations.

LIVE REEF FISHES AND THEIR CONSERVATION STATUS



Conservation status according to IUCN
All photos from IUCN Red List except specifically marked

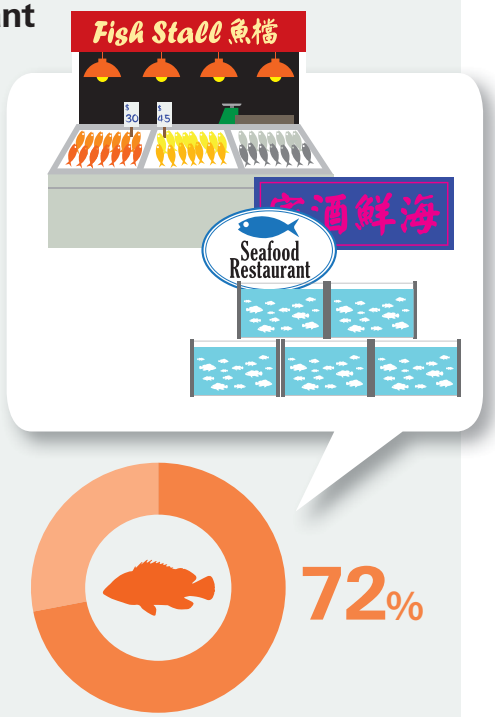
Trade volumes underestimated

Significant gaps in the trade data mean that trade volumes are likely substantially under estimated

While CSD maintains the most reliable available database on Hong Kong's international trade, the recorded trade volumes of LRFF are nevertheless regarded as a substantial under-estimate. There are significant gaps in the trade data, and thus in the volumes of live reef fish documented, due to current regulatory practices, particularly in relation to the exemption of Hong Kong Registered Vessels (HKRV) and transshipments from customs declarations. Not only is this a source of significant underreporting, it is a serious loophole that facilitates the Illegal Unregulated and Unreported (IUU) trade and the smuggling of species listed under CITES. Information on re-export volumes from Hong Kong is also insufficient and there is known to be substantial IUU trade between Hong Kong and China.

Vulnerable groupers are a significant component of the trade

Many grouper species are considered vulnerable to overfishing due to their biology and life history and according to IUCN, 12% are at risk of extinction if current trends continue and a further 13% are at risk of extinction in the near future. Nevertheless, they continue to be the most sought after species, (along with the Humphead Wrasse), and thus represent a significant component of the LRFFT. In 2013, according to import data, grouper species comprised 72% of all LRFF species on sale in wet markets and restaurants. Again, this raises the question of the sustainability of this trade.



Mainland China and Hong Kong are prodigious consumers of grouper species

Global grouper production from wild capture and mariculture, especially in China and other Southeast Asian countries, has increased rapidly over the last 10 to 15 years. Within the Asia-Pacific region, China and Hong Kong dominate the grouper trade; in 2011 accounting for almost 50% of all production, from both capture and mariculture[6]. China's contribution to overall production is predominantly from mariculture.

In term of consumption, China and Hong Kong are prodigious consumers of live grouper species from both wild-caught and cultured sources.

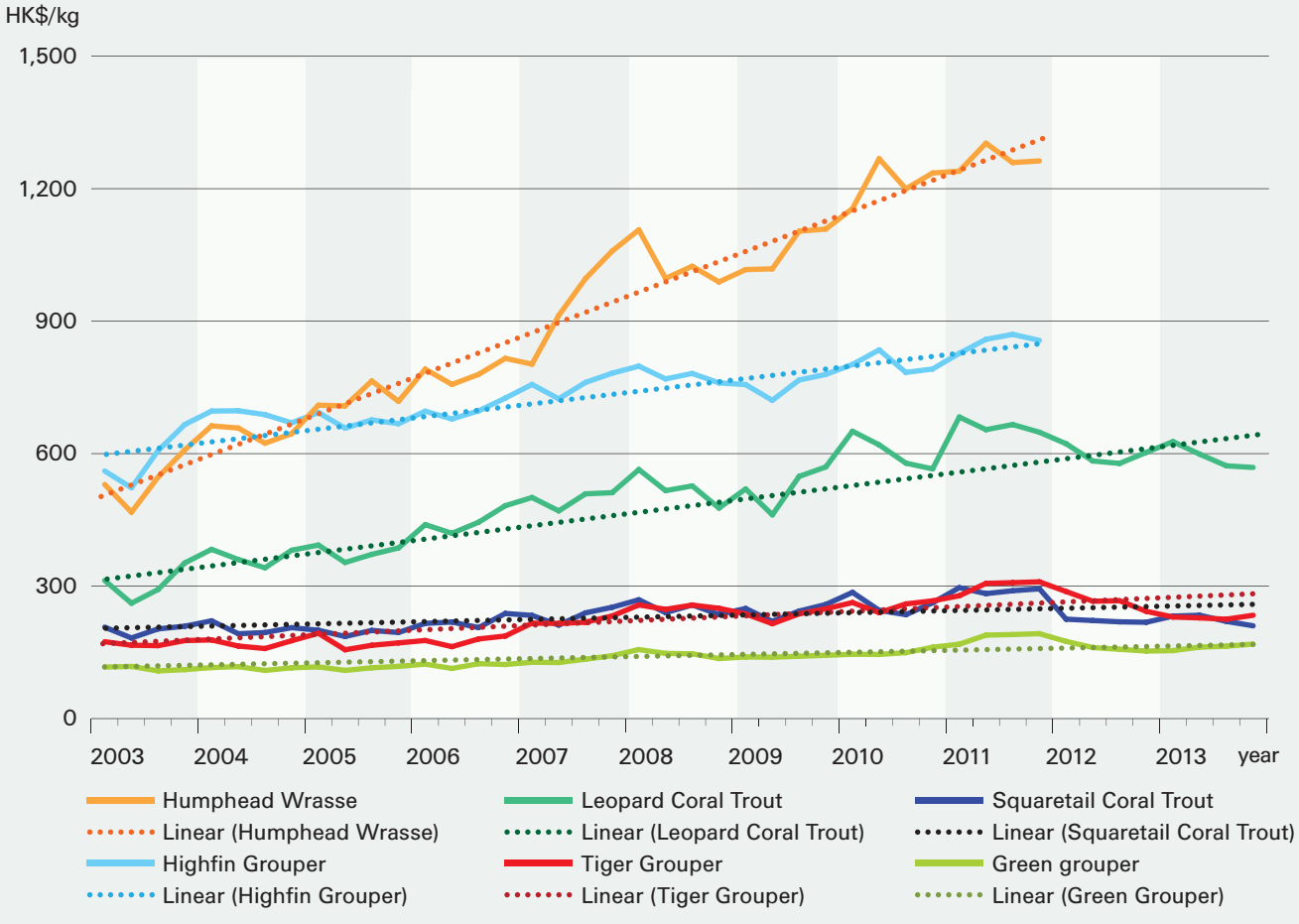
Consumption of live reef fish is closely associated with high social status

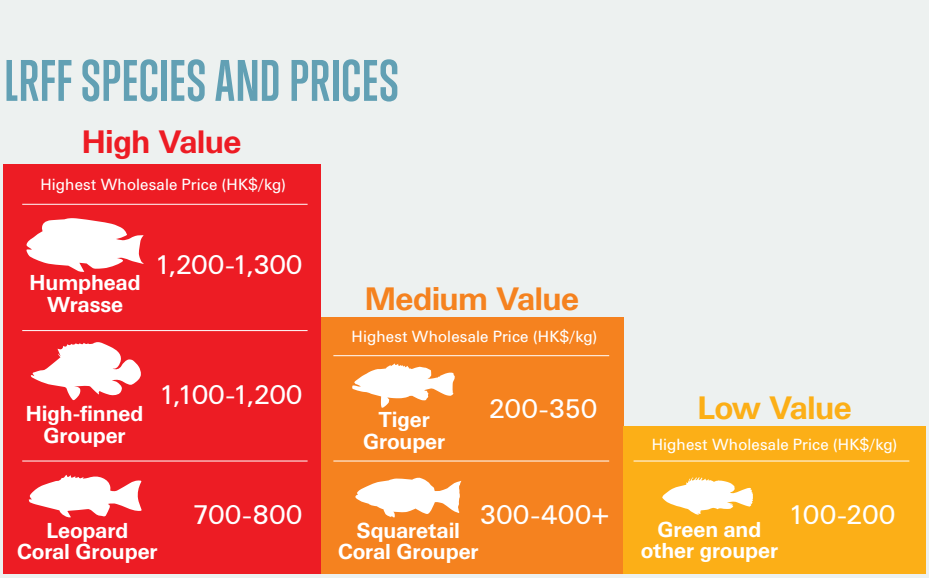
Wild fish are generally preferred and demand is increasing

A luxury commodity in high demand

As luxury seafood, live reef fishes have long satisfied a strong market in Greater China[7], typically being served at banquets or in high-end restaurants as a conspicuous consumption choice among affluent Chinese[8]. Consumption is associated with high social status, and wild fish are generally preferred for their superior texture, taste and appearance; for example the red colour of Leopard Coral Trout is particularly appealing. Further, there are currently no sources of live reef food fish certified as sustainable by voluntary third-party certification schemes, such as the voluntary Marine Stewardship Council (MSC), which certifies that seafood products are produced sustainably. There does exist an International Standard for the LRFFT, created in 2006 and whilst this standard[9] contains a section on trading, this has only been sporadically used to develop best-practice guidelines in some producing countries.

LRFF BY MONETARY WHOLESALE VALUE AND VOLUME





A low volume high value trade for Hong Kong and the region

The LRFFT is a low volume high value trade; with a retail value over USD 1 billion annually

While the estimated volume of the global LRFFT is not substantial compared to other seafood products by weight, its high unit value can deliver large profits and as such this seafood trade is one of the most lucrative in the region. A clear example of this is the high value relative to volume attributed to live fishes as a percent of total seafood imported into Hong Kong. LRFF is ranked 8th by weight of all seafood imported into Hong Kong and represents a high value trade.[10]

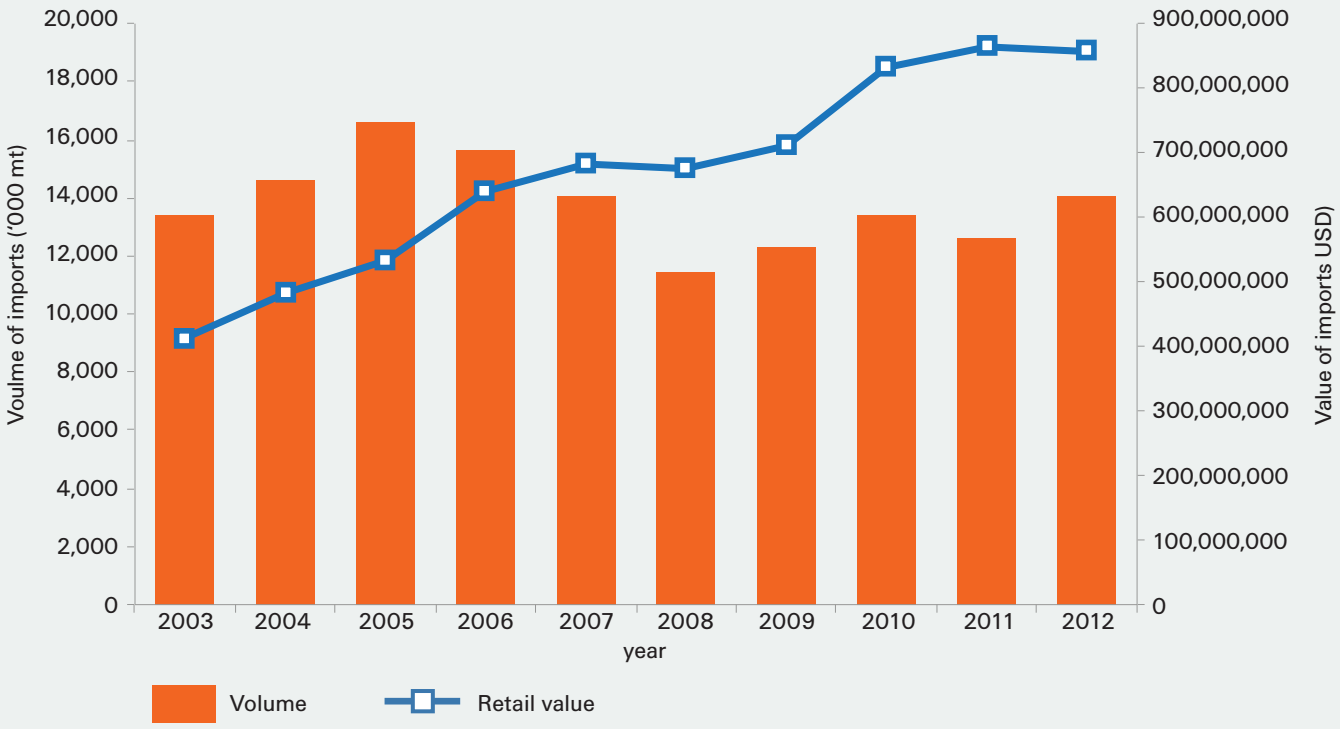
It's one of the most lucrative seafood trades in the region

By weight and value, the regional trade in live fish across Southeast Asia is estimated to be around 18-20,000 tons annually with an estimated wholesale and retail value of around USD600 million[11] and US$1 billion per annum, respectively[12].

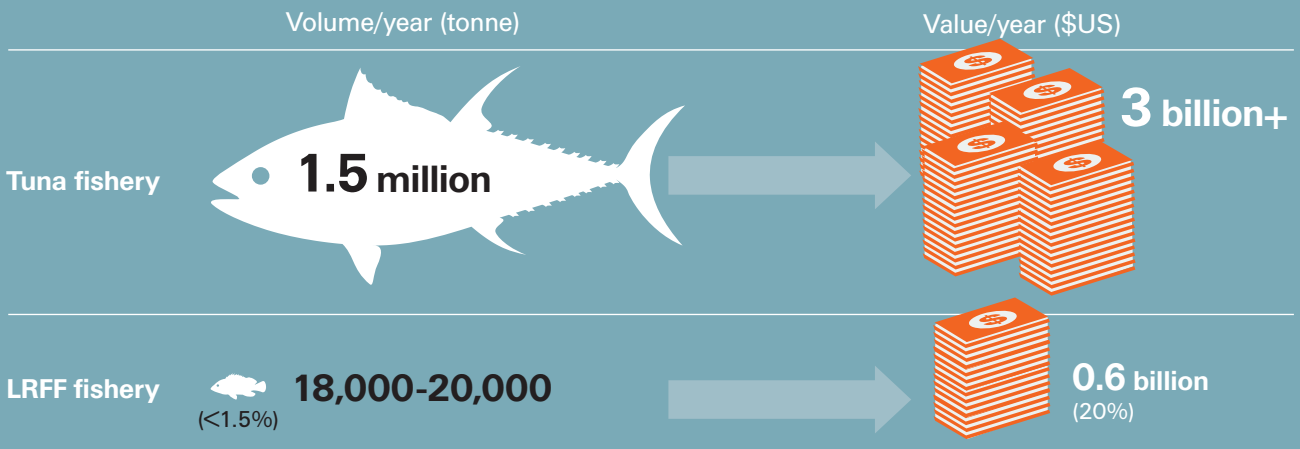
By contrast, the tuna fisheries of the Western and Central Pacific are estimated to produce roughly 1.5 million tons annually with an estimated value in excess of USD3 billion. The LRFF fishery as a whole is less than 1.5% of the Tuna fisheries by weight, yet around 20% by value.

LRFF TRADE VOLUME VS VALUE 2003-2012

CSD data



Wholesale Value Comparison of Tuna and LRFF



4

IMPACTS AND OUTCOMES OF THE LRFFT

Biological overfishing of several highly sought-after reef fish species is occurring; some are at risk of extinction if practices do not change.

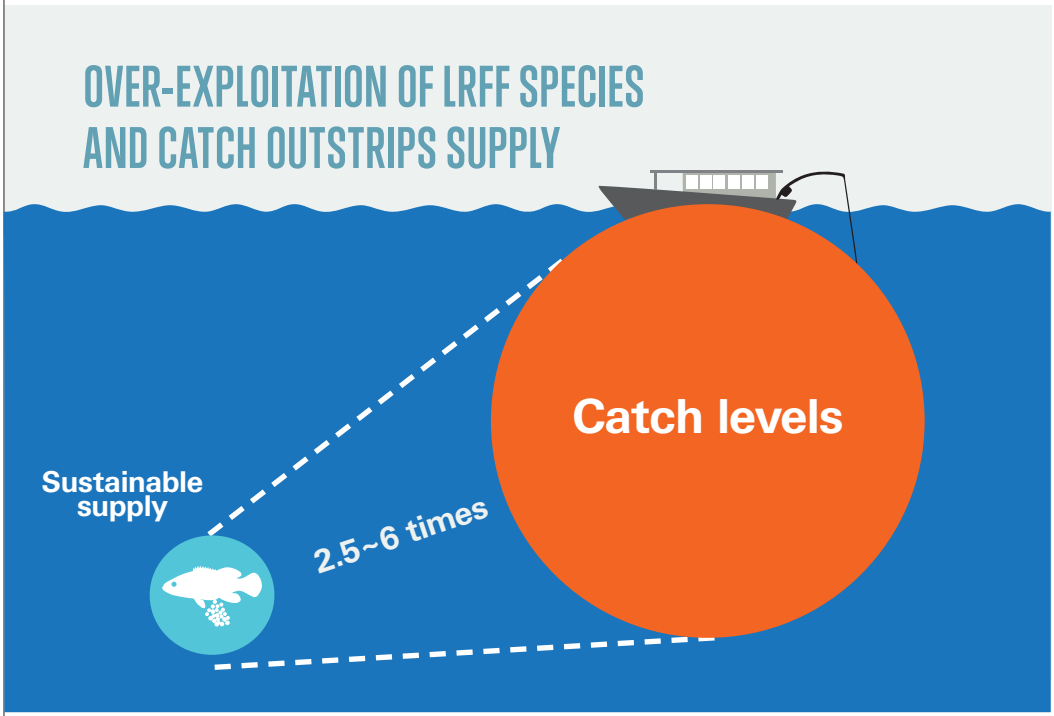
Over exploitation threatens species with extinction

The relentless demand for luxury seafood is driving continued over-exploitation of many LRFF target species in many areas. A number of factors contribute to this including species' biology (species are not naturally highly productive), lack of management, shifting fishing grounds and juvenile capture, as well as inadequate international and national regulation. Despite the relatively small trade volumes, catch levels are outstripping biologically sustainable supply rates of target populations by 2.5 to 6 times[13,14].

Several of the most popular or valuable species, including the Humphead Wrasse (HHW), Leopard Coral Trout, Square-tailed Coralgrouper and Camouflage Grouper, are threatened or, near threatened according to the IUCN Red-List (see page 9)[15]. This means that they are at risk of extinction in the wild if present practices continue. The HHW gained some protection when it was listed on CITES Appendix II in 2004 because its international trade as live food for luxury seafood was considered to pose a threat to the species. This means that source countries are mandated to ensure that sustainable exports quotas are established and that imports and exports are adequately monitored and reported. In spite of this, evidence strongly suggests that IUU trade in this species is occurring in both importing and exporting countries around SE Asia.

Unscrupulous traders actively encourage and support collection of juveniles for grow-out, threatening fisheries and the food and earnings they generate in source countries

The lack of effective oversight and/or governance of both fishing operations and the trade by source and importing economies has allowed for unsustainable levels of fishing effort to persist, driving down stock levels to the point where in some areas the predominant catch is that of juveniles for purposes of grow-out. Unscrupulous traders, with little or no interest in the long term condition of resources, continue to encourage and support collection of juveniles threatening not only the survival of the species in that location, but resulting in disturbed communities with negative implications for food security[16].



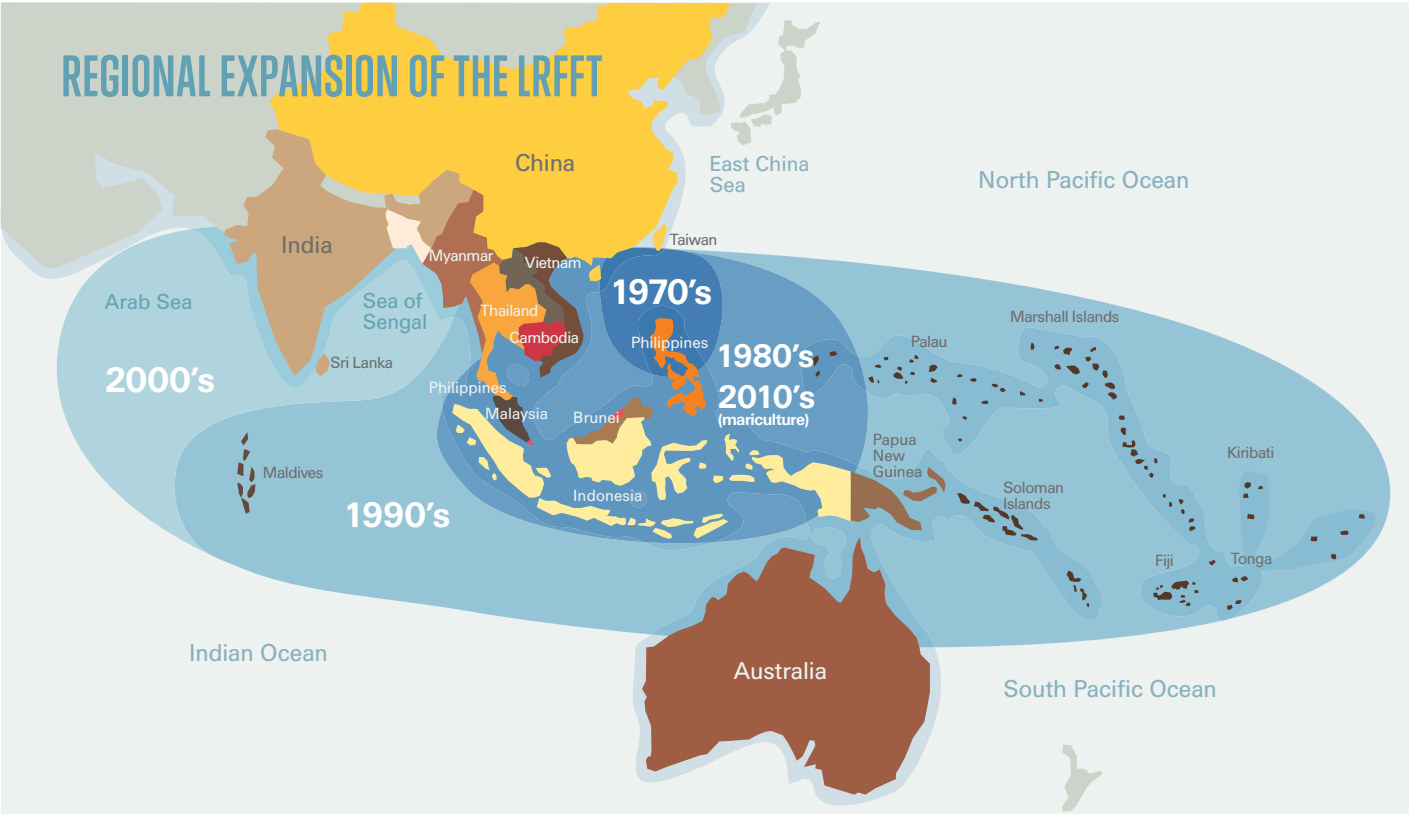
Effective regulation in support of LRFF recovery is not being implemented

There is every indication that the situation has worsened over the last decade because, despite declining stock health in many areas, trade continues and for some species is increasing. Improvements in fishing technology and transportation further intensify the pressures.[17] With the single exception of Australia, fishery management is extremely weak or lacking altogether.

Expanding the search for fish

Serial depletions have resulted in ongoing expansion into new fishing grounds

In recent decades the trade has thrived due to persistent demand for live seafood in Hong Kong and China, driven by increasing affluence. A consequence of this has been an expansion of the trade beyond Hong Kong and nearby regional waters, starting in the late 1970s.

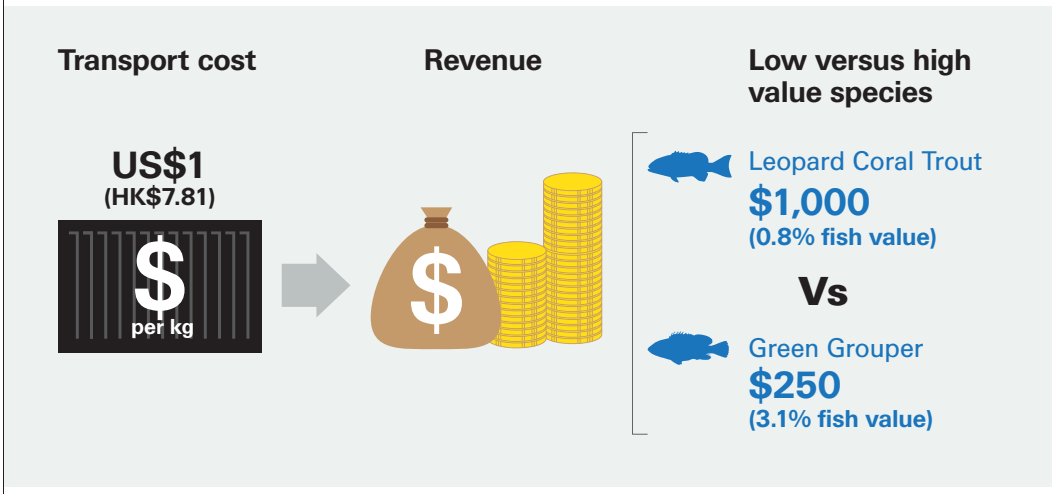


In addition to the capture of adult/ market-sized fish, fishers are transitioning to juveniles, as adults decline

Live reef fish are now being sourced from more than 40 countries/territories globally, although only a handful of countries supply the bulk (approximately 65%) of the trade. These countries currently are Indonesia, the Philippines, Malaysia, Australia while a number of other countries including Thailand, Taiwan, Maldives and Vietnam consistently export LRFF species to Hong Kong.

In addition to the capture of adult/market-sized fish, fishers in some areas rely heavily on juveniles, harvesting them from the wild to be raised in fish cages and traded as farmed or cultured fish. Good examples of such juvenile fisheries are to be found in Indonesia for HHW and in the Philippines for Leopard Coral Trout; typically the transition from adults to juvenile occurs as stocks decline and market-sized fish become scarce.

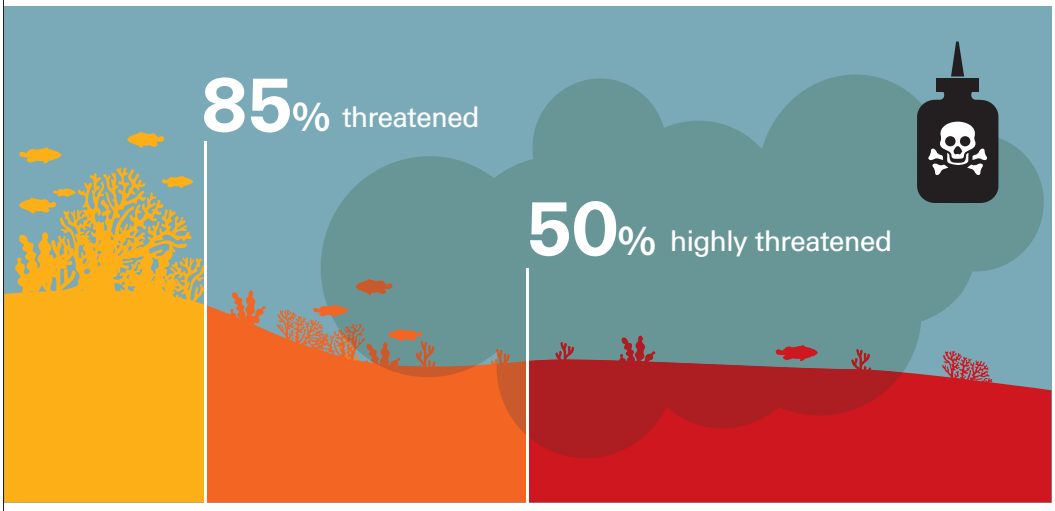
Expansion is being facilitated by: low transportation costs relative to unit value for certain species; diversification of routes and improved airline schedules; developments in cold storage technology (e.g. for chilled seafood); extensive trade connections and schedules; in the specific case of live fish and increasingly sophisticated oxygenated 'transport bins'; and the fact that frozen reef fish have not yet garnered high prices. The relative per unit cost of transport has been reduced by i) rising value of fish; and ii) lower fuel prices



In addition to concerns about serial overfishing, there is also destructive fishing in some areas, such as the use of the cyanide to stun and capture fish alive for the trade, in particular the Humphead Wrasse, which is difficult to catch in quantity any other way. As a result of these various practices and despite evidence of declines in fish health stock, fishers have been able to maintain or even increase catches. These actions, however only serve to maintain short-term interests, while amplifying the likely long-term negative social and environmental impacts.

Cyanide is the most efficient way to catch the juveniles, which can kill living coral

Notably, unsustainable fishing is the most pervasive of all local threats to coral reefs across the Coral Triangle Region with almost 85% of reefs threatened by overfishing and/or destructive fishing and around 50% considered highly threatened. The poisonous cyanide is sometimes used to catch live fish.



Burke, L., Reytar, K., Spalding, M. and Perry, A. (2012) Reefs at Risk Revisited in the Coral Triangle. A report prepared for the World Resources Institute. 86p

It's estimated that that tens of thousands of HHW are illegally traded internationally every year

A thriving illegal trade

Traders are particularly interested in the higher retail value species such as the Humphead/Napoleon Wrasse and Leopard Coral Trout, due to their high profit margins. The listing of HHW on CITES Appendix II was the first and only commercial food reef fish species to be so-listed. In most places where the species is targeted, only juveniles remain in any number, adults have largely gone and the trade relies on grow-out of small juveniles to market size. As such, there is much concern for the conservation status of this species and indeed many countries have taken the unusual step of banning its export[18].

Both Malaysia and the Philippines have banned the export of HHW and today the only country with a legal export quota under CITES is Indonesia, with a maximum of just 1800 individual fish permitted for export in 2013. Furthermore, in an effort to bring the international trade at sea under tighter control, and in particular to reign in illegal carriage by Hong Kong vessels, it is now a legal requirement that all exports from Indonesia are carried by air.

Since the CITES listing came into force there has been minimal trade of HHW recorded in either Hong Kong's import/re-export statistics or China's import data. This is despite the fact that such records are mandatory and that trade is so obviously going on. Legal (with CITES import permits) and illegal shipments

(without CITES import permits) that arrive by air are believed to transit into Hong Kong and smuggled into China by sea. The issue has been brought to the attention of the Hong Kong government several times in recent years and to the CITES secreteriat in 2011. CITES was sufficiently concerned by the evidence presented that a working group was established to investigate and this is on going.

Unpublished studies by WWF-HK and IUCN-GWSG[19] have estimated that tens of thousands of HHW are illegally traded to and in China and through Hong Kong annually. A China market survey[20] conducted in 2012, estimated that as much as 25mt, or around 50,000 live HHW individuals were being sold in major cities in China every year. Whilst no recent figures are available, this equates to more than 25 times Indonesia's (the major exporting country) 2013 quota. Most live, wild-caught fish entering China are not documented or monitored despite the ongoing trade.

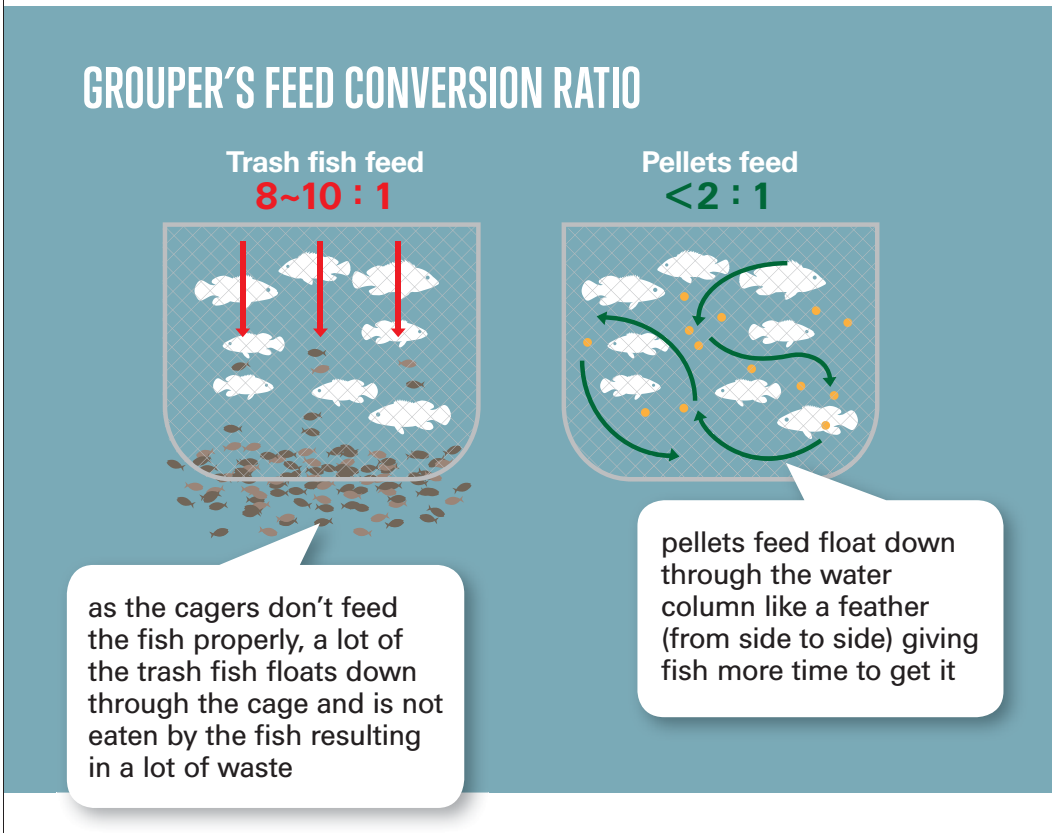
The challenge of undertaking cargo inspections facilitates the illegal trade

The problems associated with undertaking inspections of LRFF in relation to both airlines and customs authorities in Hong Kong, facilitates continuation of these illegal practices.

The myth that 'mariculture will reduce overfishing'

Grouper aquaculture does not reduce fishing, but puts additional pressure on wild fish populations

Groupers, which make up the majority of the traded LRFF are carnivorous. They exhibit poor feed conversion ratios (FCR) i.e. the weight of feed to fish produced. Groupers have some of the highest (i.e. poorest) key conversion ratios of all cultured fishes, hence their mariculture requires large volumes of fish feed. In the case of "trash fish" feed, FCRs are typically 4:1 but can be as high as 10:1 due to waste during feeding, whereas for pelleted feeds these ratios are less than 2:1[21] However, access to high quality pellet feeds remains problematic as does the higher initial costs[22], with the result being ongoing preference for lower-cost 'trash' fish for feed, which comes from wild populations. The procurement of trash fish for feed, often comes from unsustainable activities such as tropical shrimp trawls, or from operations which involve human slavery e.g. in Thai fishing fleets.[23]



Inefficient feeding can lead to conversion rates as high as 10:1 whereby 10 kg wild fish are needed to produce 1 kg of grouper

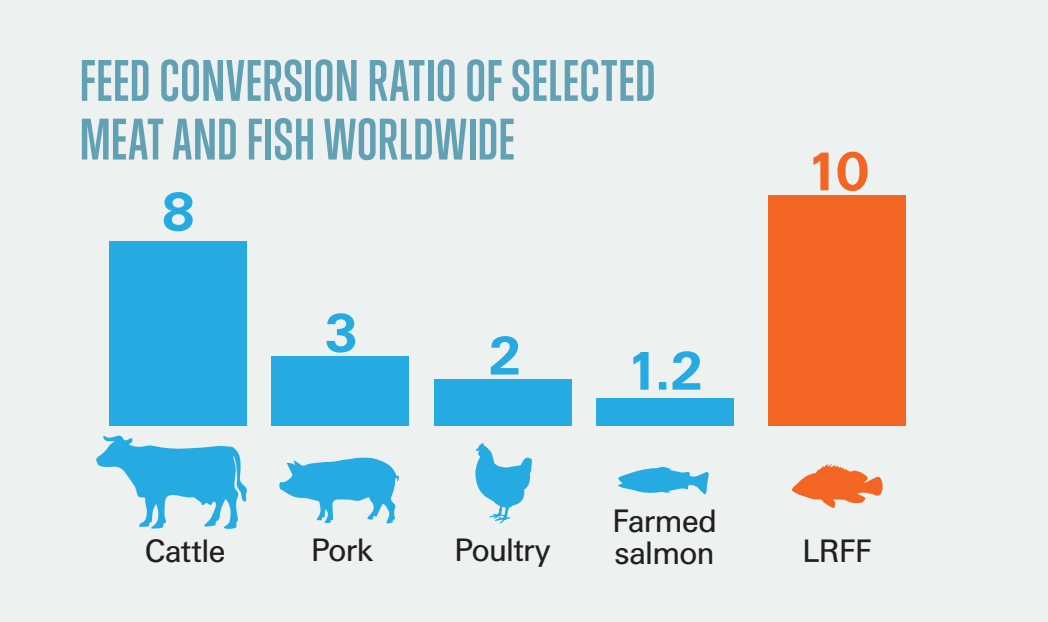
Despite the widespread assumption that cultured LRFF can take pressure off wild-caught species, it does not reduce fishing of target species but acts instead as an additional supply to meet demand. Wild capture fisheries will continue to supply live fish and also wild juveniles for some mariculture grow-out as well as wild fish for grouper feed.

Considering food security in source countries

Unlike shark fin or sea cucumber, reef fishes are important domestically as food and for domestic trade

According to the 1996 World Food Summit, food security is defined as existing when all people at all times have access to sufficient, safe, and nutritious food for a healthy and active life. Access includes both physical and economic access taking into account dietary needs and food preferences. This is highly relevant in the case of the international trade in reef fishes from developing countries because, unlike shark fin or sea cucumber, reef fishes in many countries are important domestically as food and for domestic trade.

Although it is widely assumed that international trade aids economic development and that benefits ultimately accrue to those most in need, it is far from clear that this is indeed happening in relation to exports of wild-sourced seafood, many of which are harvested by the poorest of communities[24].



Indeed, studies clearly show that, in the case of seafood exports from developing countries, if the underlying resource is not managed it is typically degraded with losses passed on to producer communities; very few developing countries manage their inshore fisheries well, including reef resources[25].

A grim outlook

It is clear the LRFF fisheries cannot sustain the high fishing pressure that target populations are exposed to

It is clear that over the last two decades the LRFF fisheries of Southeast Asia and Oceania, with the possible exception of Australia, have not sustained the high fishing pressure that wild target populations are being exposed to without showing significant declines in the health of fish stocks[26].

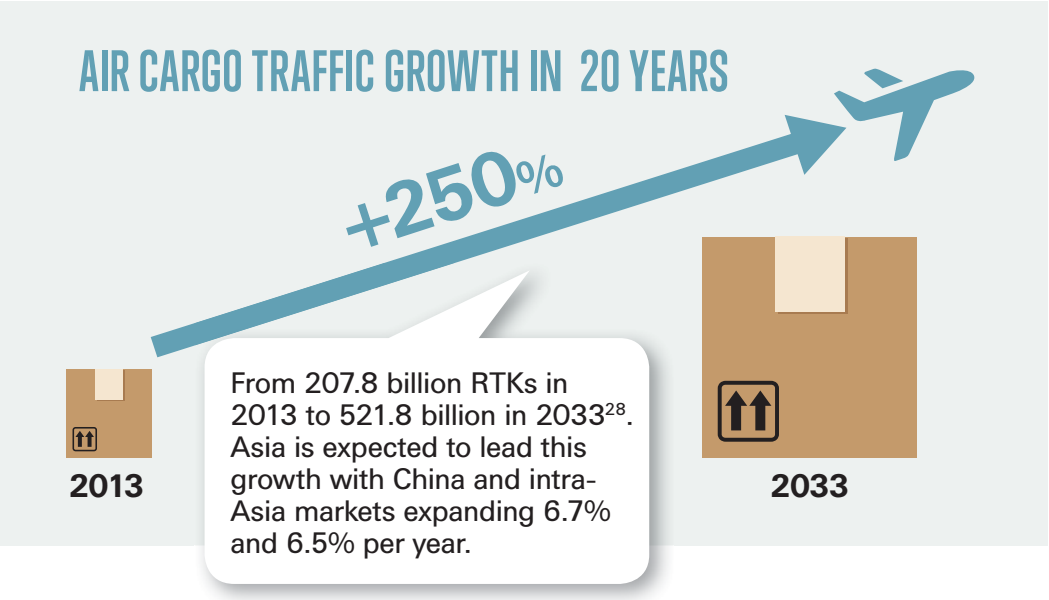
There is every indication that demand for wild caught LRFF will continue to increase because some of the most desired species can only be supplied by wild capture fisheries and many consumers prefer wild-caught fish. In addition, interest is now spreading north beyond the traditional demand center of southern China and concerns are that increasing scarcity of the product from already overfished resources could actually stimulate demand because of the oftentimes perverse relationship between rarity and value for perceived luxury commodities among wealthy consumers.[27] The value and thus demand is expected to increase, aggravating an already difficult situation.

Even frozen reef species are garnering a relatively high price, creating additional pressure on the fishery

The incentive to trade in some species will therefore likely remain strong, regardless of their parlous stock status; and for as long as fishers earn more for live than dead fish, so too does the incentive to fish for the live trade. Even frozen reef species are now garnering relatively high prices, which only serves to add additional fishing pressure to an already unsustainable fishery.

In the absence of effective fisheries management in most supply countries, almost all of which are in the developing world, catch levels will continue to outstrip wild fish reproductive capacities. As such, the localized serial depletions of some LRFF species are expected to continue, pushing these species overall towards extinction, impacting biodiversity, and reducing livelihoods and seafood supply for local communities. All this is occurring despite numerous interventions to address the LRFFT over the last 10-15 years.

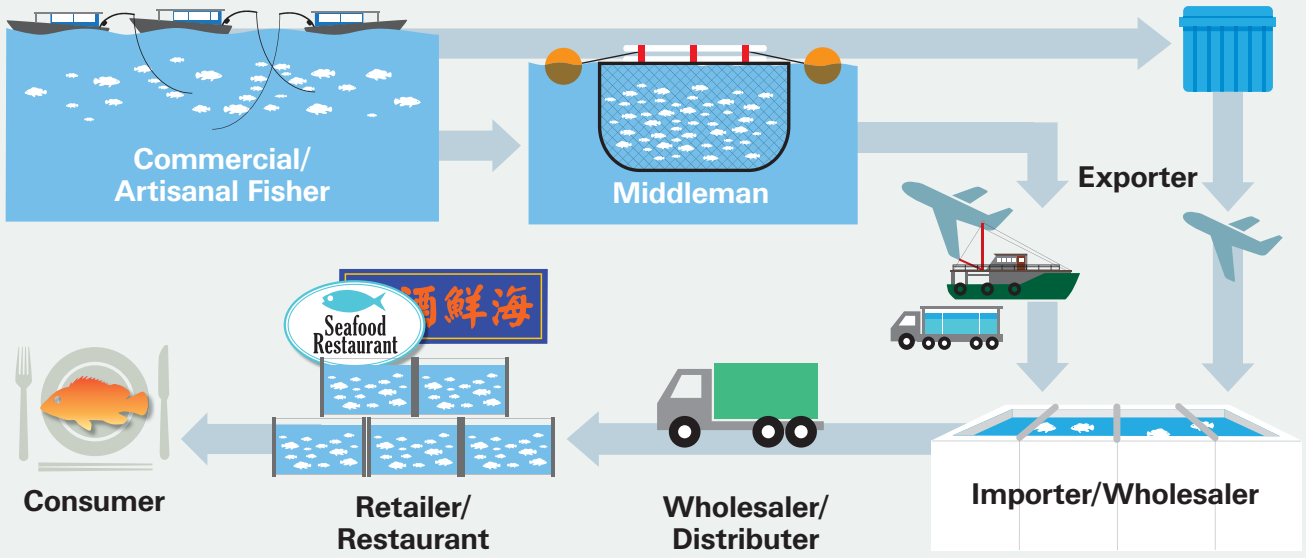
As regards the aviation industry, over the next 20 years air cargo traffic is expected to grow by about 250%. If as expected, there continues increased demand for LRFF, then air carriers will likely continue to play a key role in its transport. As such they have the opportunity to contribute to imrproving sustainbility of the LRFFT trade which depends on fisheries facing potential ecological collapse.



5

THE SUPPLY CHAIN

LRFF JOURNEY FROM SEA TO TABLE



Remarkably, fish are retained alive despite a protracted supply chain from remote fishing grounds to Hong Kong's restaurants

A web of players and unequal distribution of benefits

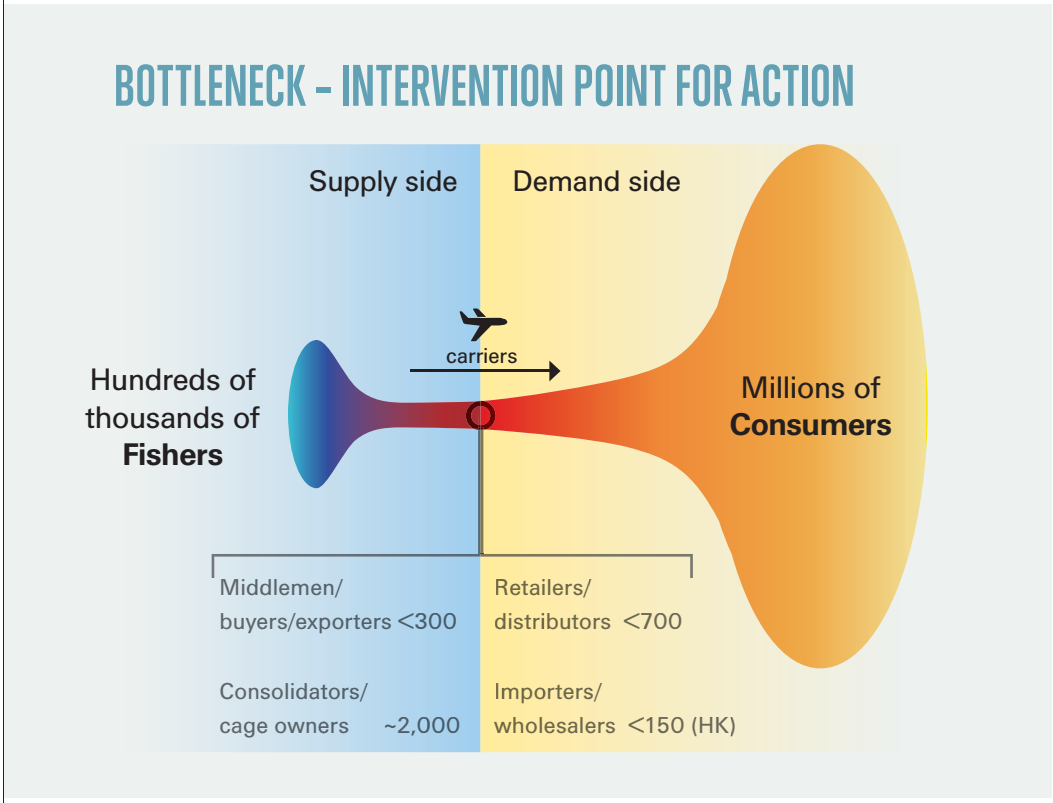
The LRFF trade has an extended market chain and LRFF pass through many intermediaries before reaching the consumer's plate. The journey of a single high-value fish such as a Leopard Coral Trout, is protracted, and often complex, and the fact fish are retained alive through many hands is remarkable.

Exporters, traders and transporters, including airlines provide a potential and important intervention point for positive action

The aviation industry, part bottleneck and part solution

A noteworthy aspect of the trade is the relative distribution of the various 'players' along the supply chain; with large numbers of both fishers i.e. producers, mostly in developing countries supplying fish, and consumers in demand centers. Between these two highly populous supply/demand groups is a"bottleneck" comprising a much smaller number of exporters, traders and, importantly, transporters, including airlines.

This 'stem' or bottleneck, highlights a potential and important intervention point for positive action. Yet to date, despite numerous efforts of NGOs, research and development agencies,[29] there has been little meaningful engagement with, or action by, those sectors that occupy the bottleneck.



Playing a key role within this group are the air carriers. In 2013, over half of the reported LRFFT imports into Hong Kong (8,395 tonnes) were via air carriage, reflecting a fairly consistent trend over the past decade and a half. As transport by air is of major importance for the live fish trade, air carriers can play a key role in positive action towards a sustainable trade.

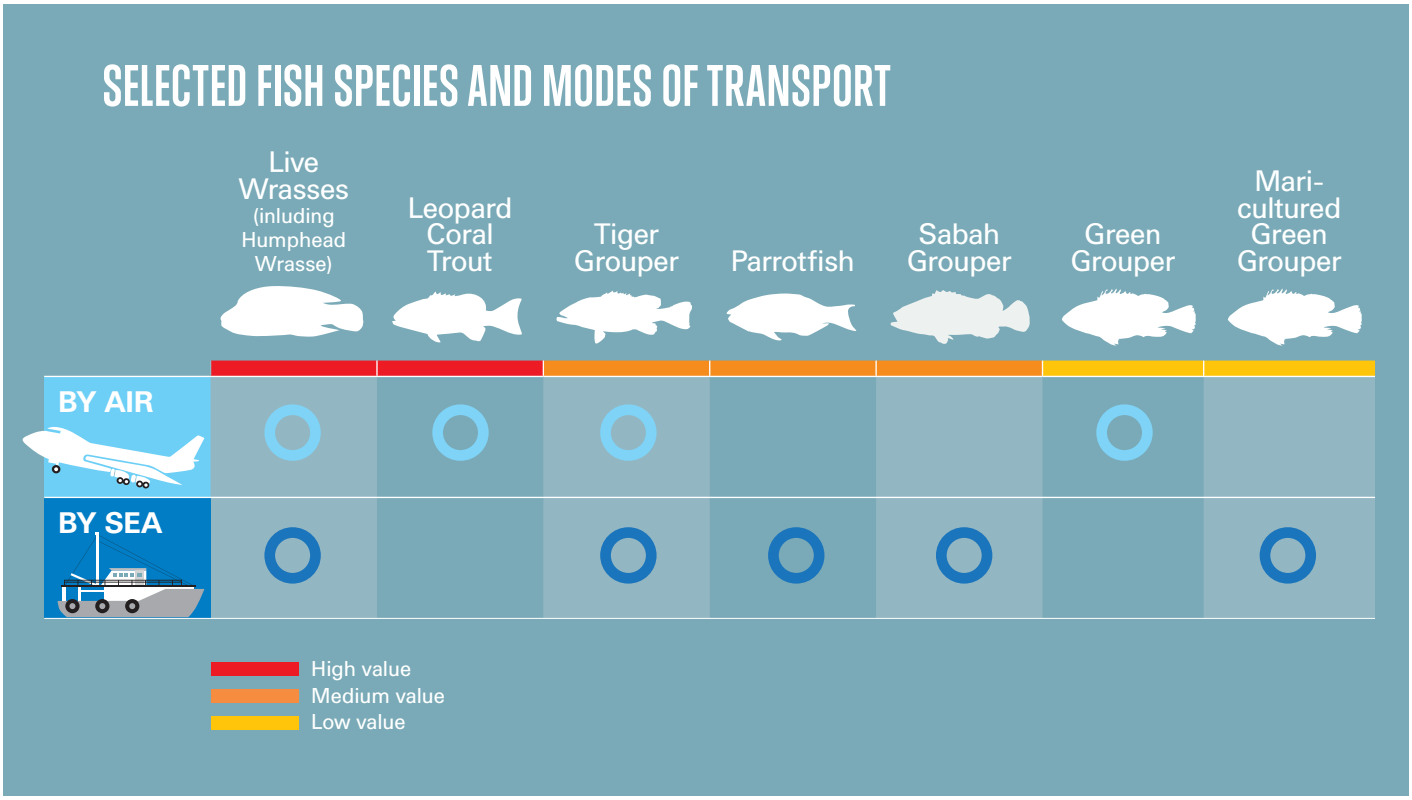
A valuable cargo

Time to market is imperative for ensuring a high quality product

The predominance of air carriage to transport LRFF is largely associated with the live and valuable nature of some of the species traded. Minimizing time to market is imperative for ensuring a high quality product and to limit mortalities and associated financial losses. Species carried by sea tend to be lower value and/or higher volume and are those generally considered hardier and able to endure longer journey times; this includes the more robust farmed species. The predominant mode of transport for frozen and chilled fish is currently not known due to data scarcity, with an unknown quantity conducted by air.

LRFF can earn air carriers more than other types of cargo which take up same space but weigh less

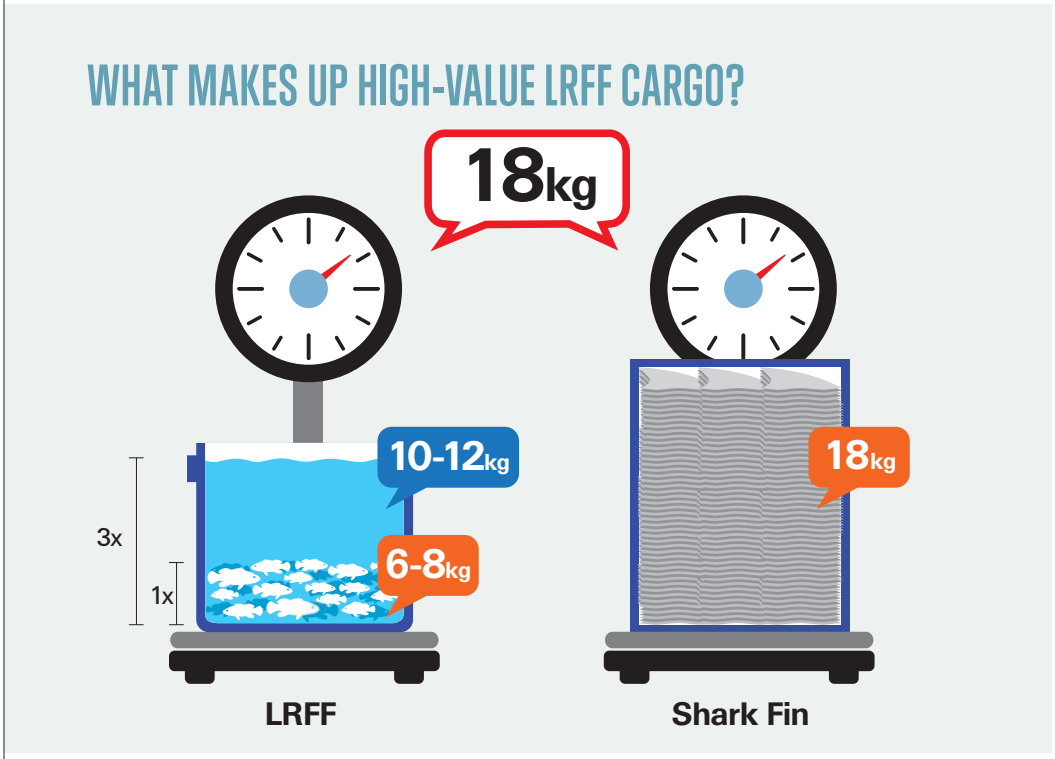
Despite relatively high costs of air transport, the high retail prices and profit margins proffered by some species allows for extensive use of air cargo. Shipping live fish is also lucrative to airlines because freight costs are charged on the basis of volume (m^3) or weight, whichever yields the highest price. Because water is a necessary part of any LRFF shipment, LRFF can earn the airline more than cargo that takes up same space but weighs less. As an example, for oxygenated bins, the ratio is approximately 3 litres of water per kilogram of fish. Thus a bin holding 320kg of fish and that occupies $1m^3$ of space will weigh around 1 ton with water, which is typically much more than a dry good occupying the same space.



LRFF traders will often pay a "premium" for their LRFF cargo

Thus, live reef fish represent a significant component of high-value cargo which airlines in the region benefit from carrying. By comparison, unlike shark fin which is largely transported dry and is thus comparable in value to air carriers as other bulk dry cargo, LRFF is highly time-sensitive. Delays or slow transshipments can result in mortalities and significant financial losses.

As a consequence, when cargo space is limited, LRFF traders will often pay a "premium" to ensure their cargo is shipped at the specified time, and is monitored throughout the shipping process at origin, destination and transshipment terminals. This "premium" can fluctuate depending on competition for cargo space, although larger shippers likely negotiate set rates (which are still higher than dry, standard, cargo) based on volumes shipped.



The premium per kg of shipped LRFF is reported to be 3 to 10 times higher than other bulk cargo and for this reason airlines will likely consider any corporate sustainability arguments around the carriage of LRFF in the context of profitability, particularly in low oil-cost environments such as those which currently prevail. It is also noteworthy that live fish packaging can be accommodated in the lower cargo holds of passenger aircraft, adding greater profitability to a carrier's flight planning even when passenger bookings drop.

Knowing what you carry is a challenge

Considerable trust appears to be placed in consignors to accurately report cargo to the airlines

There appears to be little monitoring, transparency, or practice of "knowing your cargo" within the airline industry as regards LRFFT. Airlines do, however, have a responsibility to ensure that the cargo they carry is accompanied by the appropriate documentation, such as the cargo manifest. Only in circumstances where airlines have a clear reason to believe that cargo could be unsafe, pose a threat to the safety of a flight or contain illegal contraband, would they seek to investigate cargo with the cooperation of Hong Kong's Customs and Excise Department (CED). The unspecified nature of what is being transported is then something of a challenge for those airlines that want to implement sustainability policies, given that it is not normal practice for airlines to arbitrarily or systematically open cargo to check that the manifest is correct and, in most cases, there is limited screening of cargo contents. Nevertheless importing unmanisfested goods is an offence under CAP60 the Import and Export Ordinance. In general, considerable trust appears to be placed in the accuracy of the information provided by the consignor. However, according to case law a mere assertion that in the industry the carrier would only rely on the representation of the consignor, appears to be insufficient.[30]

Transport bins sealed before reaching airport cargo areas make it impossible to inspect contents

The manifest, as required by the Hong Kong government, is a fairly simple document, with minimal mandatory information requirements. Species identification is not required, and, in terms of place of origin, only the place where the LRFF was loaded is required not the provenance of the fish.

The Hong Kong Government's guidance to carriers on how to submit goods' descriptions in manifests (the EMAN Guidelines[31]) advises different approaches including up to the same level of detail as customs declaration, which for reef fish include species identification (i.e. 8 digit customs coding)[32]. This has relevance to airline manifests that seemingly adhere to minimum requirements. Recent research[33] has highlighted the growing need to enhance the specificity of the customs codes to strengthen wildlife enforcement and monitoring to help meet broader conservation targets.

The limitations of the current manifest system is compounded by the means by which LRFF are shipped by air. There are two types of container used to transport LRFF; traditional Styrofoam boxes and purpose-built aerated or oxygenated transport bins. Both types are sealed before reaching airport cargo areas, making it impossible for the contents to be inspected without opening the container, possibly compromising the cargo. As a result, it is difficult for airlines to know what they are carrying with any degree of certainty, as regards LRFF.

6

RISKS AND CSR CONSIDERATIONS

Hong Kong's reach and demand for live fish has gone relatively unchecked, to date

Although the LRFFT does not elicit the emotive responses associated with shark-finning, it is attracting greater scrutiny as its implications for developing countries become better understood

The impacts of serial overfishing are not readily evident until trade flows and volumes are examined

A false sense of security amidst increasing scrutiny

To date, Hong Kong's reach and demand for live fish have gone relatively unchecked. Mounting attention to the status of fisheries and oceans, coral reef condition, food security especially developing countries, and illegal and damaging fishing, however, brings greater focus on the need for more responsible trade, including that of the seafood industry.[34] As an example, the negative consequences of Hong Kong's high levels of consumption/trading of shark, ivory and pangolin, and to a lesser extent, LRFF, are coming under increasing scrutiny. Earlier this year and for the first time, an international workshop for the transport and logistics sector on countering illegal wildlife trade was held in the region by TRAFFIC , supported by USAID , IUCN and the World Customs Organisation. The event clearly acknowledged that the issue cannot be addressed by customs and law enforcement agencies alone.[35]

Despite the above momentum, the plight of LRFF may still not be considered as big an issue as that of more "iconic" species, because the fish are not 'trophy" items or charismatic species. Moreover, because the availability of fish is not perceived to be diminishing over time due to ever-changing sources and species of fish and ever-stocked fish tanks in Hong Kong, declines brought about by serial overfishing are not readily evident until the trade flows and volumes are examined more closely. Nonetheless, the full scale and scope of negative impacts on natural resources are now becoming clearer and this will lead to greater attention and call for action.

Reputational risk

HKIA's goal of being the "greenest" airport in the world may be compromised if the trade in certain products is not addressed

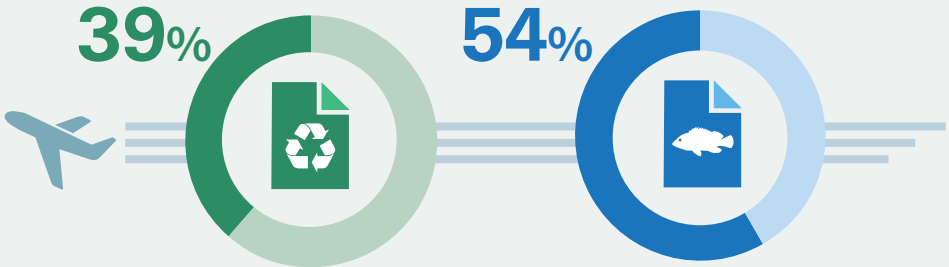
For most airlines, brand and reputation are extremely important. Indeed national air carriers are often amongst the best-known brands in their home countries. An increasingly important part of that brand value is associated with social responsibility and commitment towards sustainable development. The HKIA's goal of being the "greenest" airport in the world may be compromised if the trade in certain products is not treated with proper care, planning and attention to the issues, both current and emerging.

Airlines would do well to apprise themselves of the risks to corporate reputation associated with LRFFT

Of 26 airlines contacted for this study, the vast majority were unaware of sustainability issues relating to the transportation of LRFF, including those species that are considered to be endangered or at risk, as well as the actual species being carried. In some contexts this is understandable since, as noted, the cargo is sealed and not usually inspected by the airlines. However, this does carry potential business risks that require deeper consideration, particulary in view of public commitments that many airlines make towards sustainability and Corporate Social Responsibility principles.

The more threatened the species the more likely it is to be transported by air than by sea

Importantly, the more threatened species in this trade are also among the most valuable and sometimes illegal. Coming as they do from mainly wild capture, and shipped predominantly by air, airlines will need to remain particularly alert to risks associated with their carriage.



Is the airline industry willing to tolerate reputational risks associated with the carriage of endangered illegal and threatened LRFF?

As the issue of the wildlife trade and LRFFT continues to move further into the public realm, airlines could be faced with challenges to their brand stemming from the carriage of large bins containing threatened LRFF. Fending off demands from stakeholders to defend or justify their position may well be costly and could potentially damage reputation and brand in the long term.

Business and economic risks

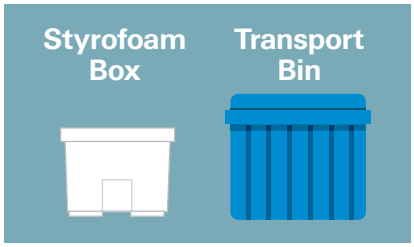
It is clear that all players throughout the LRFFT supply chain benefit financially and in some cases significantly from the LRFFT and that a reduction in the trade would potentially put these benefits, whether profit margins or cargo fees, at risk. From the airlines' perspective, continued depletion of fish stocks may lead directly to reduced catches and, hence, lost cargo income and it is therefore in the long-term interests of carriers to promote maintenance of a stable source/supply of this product as part of their overall cargo portfolio.

CSR opportunities

In addition to specific business risks, there are further considerations that, whilst not posing an immediate risk as outlined above, have important implications as regards the adoption of meaningful corporate social responsibility.

Opportunities to improve inspection and monitoring

Limited capability and capacity for monitoring and inspection is currently a significant stumbling block to stemming the importation of species illegally, e.g. the HHW and other protected wildlife, such as ivory. It is also a serious impediment to implementing, more broadly, a 'know what you carry' philosophy. However, there are opportunities for positive change as regards LRFF.



It is currently operationally difficult to open shipments of live fish for inspection, regardless of whether they are shipped using Styrofoam boxes or fiberglass transport bins. Whilst inspection of Styrofoam boxes is more problematic, inspections of the contents of transport bins could be improved in one of two ways.

To facilitate cargo inspection, one option would be to investigate the feasibility of a "viewing" window design

One option would be to investigate the feasibility of a "viewing" window incorporated into the bin design, or alternately the current top-window design could be modified to make inspection easier. This latter option currently being considered by bin manufacturers is to improve access by modifying the current lid configuration, to enhance visual inspections and significantly reduce the risk of damage. The new design also includes making lids tamper proof to ensure the integrity of the cargo post-inspection. Either measure would assist the government in its obligation to enforce CITES and could act as a disincentive for shippers to carry illegal cargo. Related to this could be an opportunity for airlines to "encourage" the use of bins over Styrofoam boxes, to facilitate tighter controls over exports (see below).

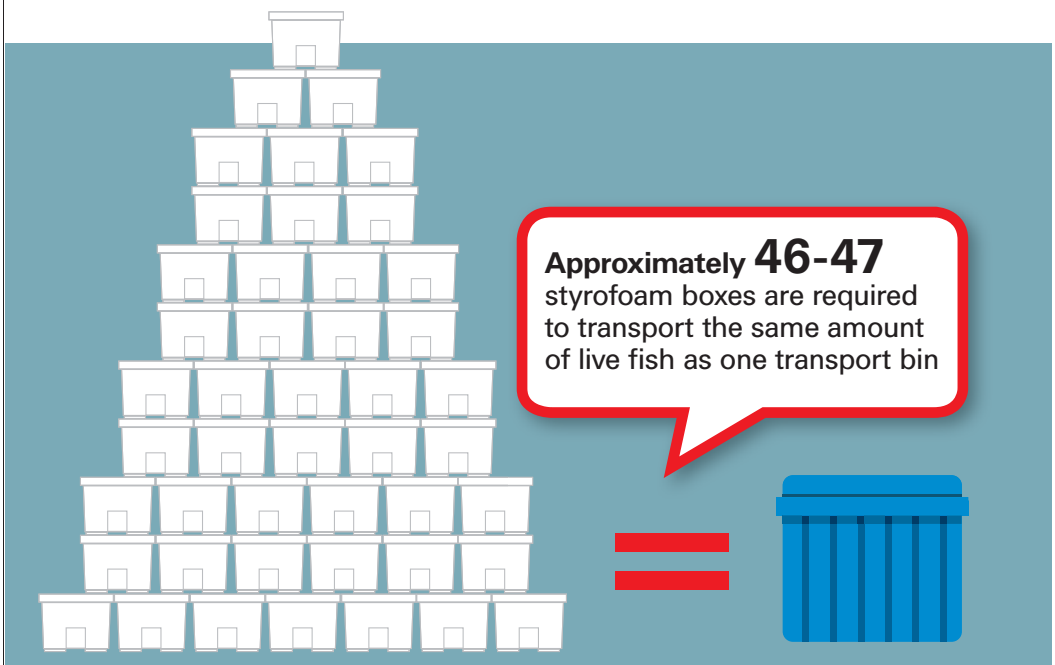
Arguments can be made for the replacement of Styrofoam boxes on grounds of waste and cost

Managing Transport Containers – an opportunity to minimise waste

Styrofoam boxes remain the predominant means to transport live fish. In terms of fish health and minimizing mortality and reducing waste, strong arguments can be made for using transport bins where LRFF are in transit for more than 8hrs. For most major exporting countries (Philippines, Indonesia, Malaysia) however, transit times from packing in country to unpacking in Hong Kong is usually between 4-6 hrs and, as such Styrofoam is generally preferred, with cost and convenience seen as the main factors.

Whilst convenience may be a defensible claim, a strong argument can be mounted for the increased use of fibreglass bins, with per unit transport costs incurred by exporters estimated to be 30-35% cheaper in the long run.

Moreover, with a life expectancy of 10 years and, based on revenues from the fish sales, bin manufacturers estimate capital costs of a transport bin could be repaid in as few as 4 shipments.



Comparison of styofoam box and tranport bin

	Styrofoam Box	Transport Bin
Fish volume	approx. 6-8 kg	320-350 kg
Life span	once	10 years average
Transport cost		**30-35% cheaper**

Wider adoption of transport bins would significantly reduce the amount of wasteful packaging from Styrofoam boxes. Assuming a bin is used for 25 trips a year, over a 10-year period, a single bin could replace up to 17,500 Styrofoam boxes over that period. In terms of the overall LRFFT, wider use of bins could theoretically reduce the use of Styrofoam boxes by many millions, but it needs to be acknowledged that use of smaller planes to transport LRFF domestically has generally precluded the use of transport bins.

Furthermore, the replacement of Styrofoam boxes for transporting fish would significantly reduce wasteful packaging because these boxes have a limited life and are known to be polluting in their disposal.

7

A TIME TO ACT
CONCLUSION AND RECOMMENDATIONS

Sustainable fishing, trade and consumption practices are imperative to reduce marine biodiversity impacts

It is apparent that use of the world's oceans needs to embrace more sustainable fishing, trade and consumption practices to reduce threats to marine biodiversity and safeguard food security into the future. From producer to consumer, whether through regulation or voluntary practice, there is a growing need to act and exercise 'due diligence' in relation to legal, ethical, economic and sustainability aspects of the trade. Individuals, institutions, traders, corporations, businesses and governments benefitting from the trade can take the opportunity to be part of a unified solution and become more informed and engaged, as they plan for future trends.

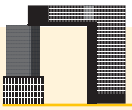
A growing number of international accords and agreements, consultations, guidelines and societal expectations acknowledge that countries and political units have clear and important responsibilities, including environmental stewardship, beyond their borders covering issues such as tracability and the suppy chain. These include EU Directives, CITES, CBD and the UN backed Port State Measures. It is now timely for those stakeholders who facilitate the movement of live fish to consider addressing several of the issues highlighted.

This report readily concedes that direct responsibility for the management of LRFF fisheries initially rests with the governments in source countries from where these fish are harvested. However, many such governments have demonstrated an inability to properly regulate their LRFF fisheries while traders have readily exploited this management vacuum. By financially supporting middlemen in source countries, who in turn recruit local fishers with prices 6-10 times higher than that of dead fish, Hong Kong traders have also contributed significantly to the over-exploitation of stocks.

Benefits appear to trickle back to relatively few fishers and for limited time periods. With so many other players in the trade, there is plenty of opportunity for more of them to contribute to better practices and recognize limitations of developing countries to police these trades. This challenge is the reason that international conventions such as CITES exist; to bring multi-country solutions to such problems.

HKIA and the airlines are in a unique position to encourage and support responsible practices in the LRFFT

By contrast, HKIA's position as one of the busiest airports in the world, its reach, visibility and influence across its business partners as well as its connection and access to the public, provide a unique and excellent opportunity to promulgate and facilitate sustainable trade and promote responsible consumption. Its partners, such as the airlines who play such a pivotal role in the LRFFT, can be a crucial intervention point. Together with HKIA they are in a unique position to encourage and support practices that can substantially contribute towards creating a more responsible and sustainable international trade in live reef fish as part of their own commitments to CSR. In the following section recommendations are provided specifically for the airlines, the Hong Kong Government and HKIA, while more general reference is made to the responsibilities of the traders and logistics providers in the LRFF supply chain. Opportunities for co-operation and partnerships are highlighted.



HKSAR Government

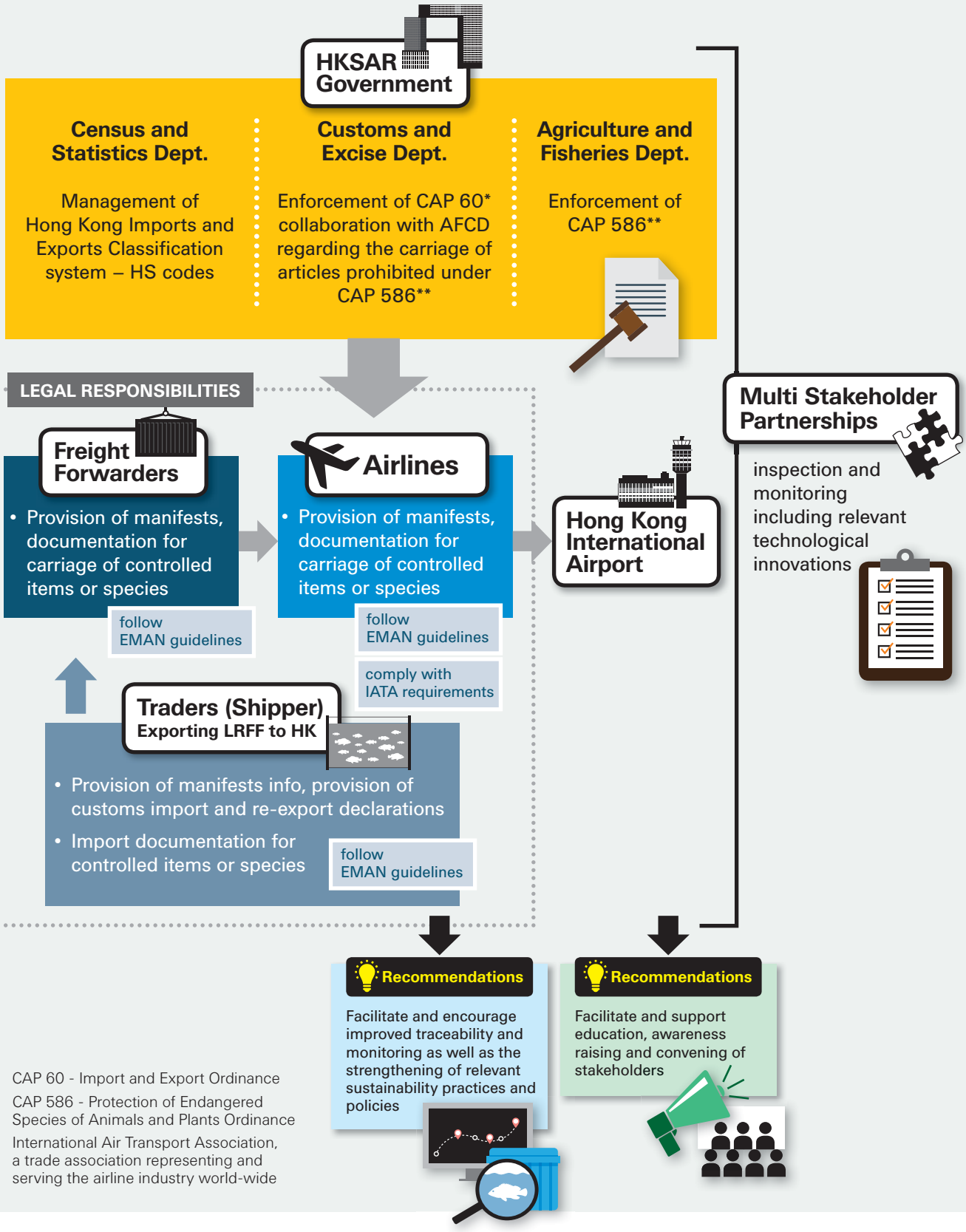
In 2011 China extended membership of the Convention on Biodiversity (CBD) to Hong Kong. By adopting CBD, Hong Kong commits itself to integrating conservation and sustainable use into its policies.[36] According to the Convention principles (Article 3), States have:

… the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Currently (2015-2016), the Hong Kong Government is in the process of drafting its Biodiversity Strategy Action Plan (BSAP) in compliance with the requirements of the CBD. Responsible trade in wildlife is thus of direct relevance to the Convention and Hong Kong's BSAP. The Principles of the BSAP currently being drafted for public consultation, state that the Hong Kong Government recognizes its responsibility to contribute to the conservation of global biodiversity. This provides a clear indication that Hong Kong's LRRFT and its regional impact is now highly relevant to national government policy.

In line with its obligation under BSAP and in view of a global movement toward increasing traceability/transparency in wildlife trade, it is recommended that the HKSAR Government work with the aviation industry including port authorities to facilitate monitoring and inspection of the LRFFT such as introduction of HS codes in manifest information and importantly in preventing the illegal trade of CITES listed species. Future policy considerations may include allowing the import of LRFFT into Hong Kong only by air.

COLLABORATION FOR IMPROVED LRFF MONITORING AND REPORTING



* CAP 60 - Import and Export Ordinance

** CAP 586 - Protection of Endangered Species of Animals and Plants Ordinance

IATA International Air Transport Association, a trade association representing and serving the airline industry world-wide

Hong Kong International Airport (HKIA)

Moving forward, it is recommended that HKIA consider raising awareness, facilitating the establishment of best practice guidelines, leveraging its convening power and determining, in consultation with the industry, what measures airlines, individually and collectively, can put in place to ensure they are not carrying illegal consignments. This is a step towards promoting and facilitating responsible trade and consumption. Specifically it is recommended that HKIA:

Raise awareness of the sustainability issues associated with LRFF amongst key industry stakeholders and encourage them to be part of the discussion relating to transport and consumption. Target audiences including the public, HKIA staff, partners such as hotels/ restaurants, airlines and relevant industry associations such as the Association of Hong Kong Air Freight Forwarding Agents (AHAFA) and the Association of Asia Pacific Airlines (AAPA). Through its role on the Airport Council International Asia Pacific (ACI-APAC), HKIA may also consider whether it can raise awareness among regional airport authorities.

Activities could include workshops, seminars, dissemination of information via publications/ leaflets, media coverage, campaigns and advocacy as well as incorporating wildlife issues into training programmes.

With a captive audience of travelers, the HKIA could make extensive use of the airport space and popular publications, public service announcements, pre-flight check-in questionnaires, etc., to display and raise awareness of issues such as threatened species, and responsible consumption. This could include making information in public areas on threatened species and regulations more prominent and informative e.g. the glass cabinet on 'CITES' and illegal trade in the baggage collection area.

Make the case that there are trends toward the full traceability of many products (including seafood) globally, and that this will put compliance pressure on those involved in transportation and logistics. Airlines could benefit from realizing that responding and engaging is in their interests from a cost and reputational perspective.

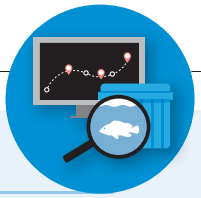
Work with industry bodies to develop guidelines for stakeholders such as the airlines regarding the sustainability and transparency issues in relation to live marine species that they may potentially be carrying/transporting, to ensure humane treatment and adequately attend to carriage of illegal species.

Provide support to industry as regards their adopting technological innovations the development of which may assist requirements for 'improved access/easier to inspect' "live fish" transport containers.

Work with partners to encourage the industry to more widely adopt the use of transport bins as opposed to Styrofoam containers, so as to reduce waste and improve inspection capability.

Explore multi stakeholder initiatives (such as those outlined below), where collaboration between key stakeholders outlined in this report could facilitate more responsible trade.

LRFF transport key players



Airlines

Transparency and traceability will continue to be a critical factor in the LRFFT and a growing issue in the seafood trade generally, both for the reputation of those involved, and for the long term stability of supply. It is therefore in the interests of those on the front line, such as the airlines, to advocate for measures that will help them better understand what they are carrying, and where and how their cargo is sourced. Furthermore, by making that information available, they can help improve LRFFT sustainability. It is recommended that the airlines consider the following:

Foster better public substainability reporting practices to include: disclosure of cargo-related sustainability challenges, with emphasis on existing efforts where appropriate, and going beyond current legal requirements to disclose significant impacts related to biodiversity and endangered species. In doing so, they can contribute to the debate about the trade in LRFF through reporting and communications strategies.

Take on board a "know what you carry" philosophy and seek to encourage accountability of upstream players such as shippers and influence the introduction of mandatory labeling and marking requirements of LRFF through engagement with industry bodies such as IATA, governments and their agencies.

With regard to airline manifests, consult with the regulatory authorities in Hong Kong and partners in the supply chain, to consider voluntarily increasing the level of detail recorded on cargo manifests, in accordance with the EMAN Guidelines and ultimately increasing the requirement for a level of detail equivalent to 8 HS Code digits.

Promote and enhance the role the aviation industry in relation to sustainable trade, including environmental conservation and specifically regulation of the Wildlife/ LRFFT trade. Do this by raising awareness both internally, and with partners and trade associations, of the issues surrounding the LRFFT including possible intervention points. Support efforts to identify and address knowledge gaps in this regard.

Work closely with freight forwarding and consignment companies to ensure the necessary checks and oversight is in place to; minimize the risk that threatened/ illegal species and unsafe goods are being packed, ensure humane packing practices are employed, and raise awareness of these issues. Encourage the notion that better knowing your clients can help reduce illegal species entering trade.

Work with industry to trial technological innovations in transportation bins that facilitate 'improved access for inspection of "live fishes", including in-house trainings on bin inspection procedures (see above). A waiver/condition could also be considered that better protects airlines from possible prosecution should inspections cause damage.

Multi Stakeholder Partnerships (MSP)

HKIA's stakeholders and partners in the transport and logistics industries encompass a large and varied number of players, each of which has its own responsibilities and obligations as regards responsible and sustainable behavior. However, because of the diverse nature of trade-related issues, whereby multiple parties across both the public and private sectors may be affected by or have influence over a particular concern, multi stakeholder partnerships are often the most effective and practical way forward.

In other industries, such partnerships have been successful in developing and supporting sustainability standards and guidelines in partnership with the private sector. This has included agriculture e.g. the Roundtable on Responsible Palm Oil (RSPO) and seafood e.g. the Marine Stewardship Council (MSC) and Aquaculture Stewardship Council (ASC).[38] In Hong Kong, the Fair Winds Charter is an excellent example of an industry-led initiative to push much needed government regulation for reduced emissions in the maritime industry[39].

It is recommended that key actors in both public and private sectors collectively consider the following opportunities that could assist in better monitoring and management of the LRFFT:

Improve monitoring and inspection – Utilize the MSP approach to investigate opportunities for improvements in labeling/inspection/tracking initiatives of cargo that do not impose additional financial costs or mortality risks on airlines and/or other actors and develop guidelines for same.

More detailed labeling and recording of individual species would help to track endangered and at-risk LRFF. Such requirements should both include country of origin and mode of production i.e. wild-sourced or farmed data. Such a move would be in line with increasing moves for traceability and global initiative such as the Port State Measures, stemming from the urgent need to address IUU.

This could involve taking the opportunity to review the feasibility of requiring details on manifests for the LRFFT down to species level.

Develop standards – HKIA and the airlines to consider ways in which a new MSP around the LRFFT could utilize existing 'generic' LRFFT Standards to pilot-test this voluntary initiative among key supply chain actors to develop more specific guidelines for the transportation of LRFF.

Fill trade data gaps – Address the transshipment data gap by gaining better understanding of the extent and quality of transshipment data submitted by consignors and maintained by airlines. Explore how these data could be made more readily available in the same vein as customs declarations, and consider what systems could be implemented to facilitate their retrieval in the same way as existing customs data.

Satisfy information needs – Comparative country analyses as regards procedures and requirements (both mandatory and otherwise) to navigate customs in other jurisdictions would be useful to determine best practice and where improvements could be made by players in the LRFFT. Further awareness and understanding of the LRFFT actors' procedures and protocols, for example, in relation to inspection and monitoring could facilitate improvements.

END NOTES

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Prepared by:

ADM Capital Foundation

Supported by:

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

Morgan Stanley

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