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TRAFFIC

B U L L E T I N

ABALONE TRADE IN HONG KONG

SUSTAINABLE USE OF NON-WOOD FOREST PRODUCTS

INDONESIA'S EXPORTS OF FROGS' LEGS

INTERNATIONAL STANDARD FOR SUSTAINABLE COLLECTION OF MEDICINAL PLANTS

The journal of the TRAFFIC network disseminates information on the trade in wild animal and plant resources

JULY 2006

The *TRAFFIC Bulletin* is a publication of TRAFFIC, the wildlife trade monitoring network, which works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. TRAFFIC is a joint programme of



The *TRAFFIC Bulletin* publishes information and original papers on the subject of trade in wild animals and plants, and strives to be a source of accurate and objective information.

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Cork oak harvesting in Coruche, Ribatejo region, Portugal
(WWF-Canon / Sebastian Rich)

This page, from top:

Fejervarya cancrivora (Jeet Sukumaran)

Dried abalone *Haliotis* (Allen To)

Arnica Arnica montana (Anton Vorauer, WWF Tirol)

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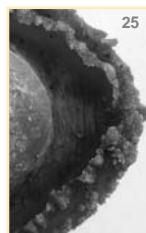
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July 2006

CAVIAR - just the very word evokes images of luxury and opulence. Yet the source of this luxury food, the sturgeon, is becoming increasingly rare in the wild due to a variety of threats, from poaching and illegal trade, to habitat loss, pollution and the damming of rivers.

Since 1997, all species of sturgeon and paddlefish *Acipenseriformes* have been listed in the Appendices of CITES. This was to halt the decline of some sturgeon stocks due to unsustainable - and often unregulated - harvest and trade, and stem the high levels of illegal trade. The ultimate aim was to facilitate a trade that was both legal and sustainable.

Since then, CITES has attempted to use every tool at its disposal in order to make its provisions work for sturgeons. This has included a Review of Significant Trade, new CITES Resolutions and Decisions, regional agreements, annual export quotas, trade restrictions, various missions to range States and numerous notifications to CITES Parties. The issue has been discussed at almost every meeting of the Animals Committee, the Standing Committee and the meetings of the Conference of the Parties to CITES that took place since the CITES listing in Appendix II.

EDITORIAL

Yet eight years later, in May 2005, an international symposium that brought together more than 500 sturgeon experts and scientists from around the globe concluded that the state of sturgeon stocks worldwide continues to decline. Many sturgeon populations are now highly threatened, with some facing the risk of extinction. Based on the revised *IUCN Red List of Threatened Species* published in 2006, 23 of the world's 27 species of sturgeon and paddlefish are now threatened with extinction, of which six are considered as Vulnerable, eleven as Endangered (including the most-sought after species Russian Sturgeon *Acipenser gueldenstaedtii*, Persian Sturgeon *A. persicus* and Beluga *Huso huso*), and six are categorized as Critically Endangered.

Concern over the plight of the sturgeon was clearly demonstrated when, in early 2006, the CITES Secretariat postponed the approval of the annual export quotas for caviar and other sturgeon products originating from shared basins such as the Caspian Sea, the Black Sea-Danube River and the Amur-Heilong River. The information provided by the range States indicated that many of the sturgeon species in these shared fishing grounds were suffering serious population declines and the quotas proposed did not appear to reflect fully the reductions in stocks or make sufficient allowance for illegal fishing. By April, the CITES Secretariat finalized its assessment of the export quotas and only authorized an export quota of 44 tonnes of caviar from the Persian Sturgeon from Iran, and 1.4 t of beluga caviar from the Black Sea-Danube River basin, with no export quotas for caviar from other sturgeon species published. In practice, this means that no exports of wild harvested caviar of these sturgeon stocks should take place in 2006.

Though often incorrectly referred to as a "ban" in the media, this decision has certainly sent a strong signal to caviar-producing countries and traders, emphasizing the need to comply with the provisions and requirements

agreed to by all CITES Parties. It also brought increased awareness to the significant levels of illegal caviar that is being traded internationally and nationally. It is estimated that the illegal trade exceeds legal trade by several times and is likely to be the primary cause for the drastic population declines that several sturgeon stocks have encountered in recent years. These high levels of illegal trade undermine the efforts to halt the population declines and to facilitate a trade in sturgeon products that is legal and sustainable. They also demonstrated the need for caviar exporting and importing countries alike to step up efforts significantly in order to crack down on these illegal activities - many with strong linkages to organized crime networks.

Two important and encouraging developments addressing this illegal trade have occurred this year. One of these has been the adoption of a universal caviar labelling system by the European Union (EU) - the world's largest consumer market for caviar, accounting for almost 50% of all caviar reported in legal trade in recent years. In May 2006, the EU adopted a new regulation that made the caviar labelling requirements agreed to by CITES Parties in 2003, and described in CITES Resolution Conf. 12.7, legally binding

in all 25 EU Member States. The new regulation requires that all caviar tins in trade in the EU bear a label that contains information such as the year of harvest or re-packaging, the registration number of the processing or repackaging plant and the country of origin of the caviar. In addition, all caviar importing, exporting, re-packing or producing companies have to be registered and maintain records of all caviar traded.

These new rules will help to combat the forces driving illegal trade in caviar as it will not only enable authorities to identify the source and origin of the caviar but also allow consumers to distinguish between legal and illegal caviar products. However, the effectiveness of these new labelling rules will be dependent upon how effectively they are implemented and enforced across all of the 25 EU Member States. International co-operation beyond just the EU is also essential in ensuring that these measures stem an international illegal trade that is driving sturgeon species to the brink of extinction. In June 2006, the European Commission hosted an international workshop attended by 120 law enforcement officials from 34 key trading countries and organizations worldwide to discuss ways to combat illegal trade in caviar. The meeting concluded with agreement on a set of rigorous measures to improve the exchange of intelligence and co-ordination, undertake joint international investigations and to implement the universal labelling system for caviar.

These are all clearly significant steps in the right direction but, with the status of wild populations of sturgeon species so perilous, it is also clear that much more needs to be done. All existing initiatives - from scientific research and fisheries management to trade monitoring and law enforcement - should operate in concert in order for these actions to be consolidated. Only with a unified drive by all involved - fishers, businesses, governments and consumers - can we ensure a sustainable future for both the species and the caviar trade.

Stephanie von Meibom Acting Director, TRAFFIC Europe
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A TRAFFIC office will be re-established in India in August 2006. The office will eventually form part of a regional programme for South Asia, but for now will be supervised direct from TRAFFIC International. Recruitment of an office head is under way and the team will also include Rahul Dutta, who was part of the earlier TRAFFIC team in India. Rahul has been working for the past year on wildlife trade issues within the species programme of WWF India.

bulletin board

Rob Parry-Jones has taken up a one-year appointment as EU Programme Co-ordinator for TRAFFIC Europe. The post has been developed to promote a strategic and cohesive approach to dealing with wildlife trade work in the EU - the world's largest wildlife market. Rob has extensive experience in TRAFFIC, working in East Asia, Oceania and more recently at TRAFFIC International, where he filled the position of UK Enforcement Support Officer while Stephanie Pendry was on maternity leave. Rob will continue to be based in Cambridge.

Sulma Warne succeeded Julie Thompson as Programme Co-ordinator of the TRAFFIC Southeast Asia Indochina office in December 2005. Sulma comes to TRAFFIC with many years of experience in Asia. He worked for IUCN-The World Conservation Union in both Viet Nam and Lao PDR between 1995 and 2002 before returning to his native Australia to complete a Masters of Environment degree, specializing in participatory approaches to natural resource management. Over the past couple of years, Sulma has been pursuing various projects, including a year working with a UNDP/GEF Coastal and Wetlands Biodiversity project in Bangladesh.

traffic websites

The newly designed TRAFFIC website will be launched in early August 2006.

<http://www.traffic.org> (English)
<http://www.trafficindo.org> (English)
<http://www.wwf.ru/traffic> (Russian)
<http://www.wwf.org.mx/traffic.asp> (Spanish)
<http://www.wwfchina.org/traffic> (Chinese)
<http://www.wow.org.tw> (Chinese)
<http://www.trafficj.org> (Japanese)

This issue of the *TRAFFIC Bulletin* is available on <http://www.traffic.org>

TRAFFIC RECEIVES AWARD

TRAFFIC has been awarded the UK PAW (The Partnership for Action Against Wildlife Crime) Partner of the Year Award at a seminar held at London Zoo at the end of February 2006. In his speech, the former UK Minister for Biodiversity commended TRAFFIC International for its professionalism, integrity and impartiality.



JIM KNIGHT (LEFT), FORMER UK MINISTER FOR BIODIVERSITY, PRESENTING THE PAW PARTNER OF THE YEAR AWARD TO STEVEN BROAD, EXECUTIVE DIRECTOR, TRAFFIC INTERNATIONAL.

TRAFFIC has been a member of PAW since its inception and is actively involved in a number of its working groups. Since 1991 the Department for Environment, Food and Rural Affairs (Defra) has co-funded an enforcement officer post at TRAFFIC and is extremely positive about the results this post has achieved. The PAW award is sponsored by Browne Jacobson Solicitors, who said "TRAFFIC is one of the best NGOs involved in PAW and its work illustrates well the value of a partnership approach. TRAFFIC's focus is both local as well as global and its work is vital to the world and its communities".

Defra also announced it was giving GBP16 500 (€23 863) to support EU-TWIX (European Union - Trade in Wildlife Information eXchange), the online database and e-mail listserver set up in October 2005 to facilitate information exchange between EU law enforcers with regard to, for example, seizures, changing laws and markets, emerging fraud, smuggling methods and routes. The government is also donating GBP250 000 to assist in the development of the National Wildlife Crime Unit, a government unit set up to gather intelligence on wildlife crime and provide investigative support to police and Customs. TRAFFIC has worked closely to support this pilot project over the last four years through provision of information on the international illegal trade in wildlife and its impacts in the UK. One TRAFFIC staff member is seconded part-time to the unit. To read more about the PAW Open Seminar visit www.traffic.org.

14TH CITES COP MEETING

The 14th meeting of the Conference of the Parties to CITES will take place in The Hague, Netherlands, from 3 to 15 June 2007.

POPULATION DIVE PROMPTS ACTION TO CONTROL TRADE IN HUMPHHEAD WRASSES

Commercial populations of the Humphead Wrasse *Cheilinus undulatus* - the world's largest coral reef fish - have declined in some areas by up to 90%. Found on coral reefs across South-east Asia, the Western Pacific and the Indian Ocean, this distinctive species can grow to over two metres long, weighs up to 190 kg and lives for more than 30 years. Specimens are caught live, often with the use of cyanide, for the restaurant trade - especially for the markets in mainland China and Hong Kong. The trade poses a threat not only to the survival of the species but also to its fragile habitat. Furthermore, juveniles are preferred over full-grown adults which have had a chance to spawn, because the flesh is said to be more tender, and smaller, whole fish are preferred in the restaurant trade. The species was listed in CITES Appendix II in 2005 and as Endangered on the IUCN Red List in 2004.

Practical methods for effective control to make the trade in this species both legal and sustainable were discussed by key countries at a three-day workshop in Hong Kong in July 2006. Representatives of all the major consumer and source countries and territories of Humphead Wrasse (Indonesia, the Philippines, Malaysia, China, Hong Kong SAR and Papua New Guinea) attended, as well as representatives from the Food and Agriculture Organization of the United Nations (FAO) and Hong Kong's seafood trade. They agreed on recommended actions to develop regional co-operation, science-based guidelines for sustainable resource use and to promote increased awareness among the fisheries industry and consumers.

"With proper implementation of CITES, trade of Humphead Wrasse can be managed for the long term," said Dr Craig Kirkpatrick, Director of TRAFFIC in East Asia. "Through co-operation and action by a wide range of stakeholders in both export and import countries, together we can achieve a legal, international trade that will stop further decline of the species in the wild." "Sustainable management plans and trade controls are still in development, and both exporting and importing countries are facing challenges in implementing the CITES listing", added Yvonne Sadovy of IUCN-The World Conservation Union. "We are hopeful that the results achieved at this meeting will pave the way for immediate action through joint efforts across different stakeholders, to ensure that all trade is carried out at sustainable levels and does not threaten the survival of the Humphead Wrasse."

The workshop was co-organized by the Hong Kong Agriculture, Fisheries and Conservation Department (AFCD), IUCN-The World Conservation Union, TRAFFIC and WWF.

www.traffic.org/25/network9/ASEAN/index.html

The new wildlife trade Regulation adopted on 4 May 2006 by the European Commission, which addresses outcomes at the 11th and 12th meetings of the Conference of the Parties to CITES, came into force on 9 July 2006.

The new Regulation introduces new provisions, for example to facilitate travel of certain captive-bred pets listed in CITES, and travelling exhibitions such as circuses. It waives the requirement to apply for new import and export permits at each border crossing. Pet owners will now be able to apply in their country of residence for a certificate allowing multiple border crossings outside the EU, but they must travel with their pets.

Commission Regulation (EC) No. 865/2006 replaces Commission Regulation (EC) No. 1808/2001 and lays down detailed rules for Member States on the implementation of Council Regulation (EC) No. 338/97.

TRAFFIC Europe

briefly



HUMPHHEAD WRASSE: POPULATION DECLINES OF UP TO NINETY PER CENT

A database has been set up that will identify the DNA of nine shark species that are commercially important but protected. Joint research by scientists at the Department of Fisheries and Department of Industry and Resources' Chemistry Centre, Western Australia, has established genetic profiles for white, grey nurse, spinner, dusky, sandbar, whiskery, gummy, blue and smooth hammerhead sharks. This database provides authorities with a valuable new tool to identify the flesh and fin samples of these species and assist in compliance checks in WA fisheries.

Department of Fisheries, Government of Western Australia media release, www.fish.wa.gov.au/docs/media/index.php?0000&mr=34028, 28 April 2006

TRAFFIC, with the support of the IUCN/SSC Bear Specialist Group and WWF-Japan, is convening the Fourth International Symposium on Trade in Bear Parts in Karuizawa, Japan, on 4 October 2006. The meeting is set to identify challenges and needs in bear conservation, review recent efforts and make recommendations for achievable actions. With an emphasis on conserving wild bears in Asia, this meeting will provide a good platform for obtaining an update on the trade and use of bear bile in Asia and the enforcement of legal controls. Further information and an online registration form is available at www.trafficj.org/kuma/symposium2006.



AFRICAN LION WORKSHOPS

Although withdrawn, the proposal submitted to the 13th meeting of the Conference of the Parties to CITES in October 2004, seeking transferral of the African Lion *Panthera leo* from CITES Appendix II to Appendix I, resulted in range States agreeing that it would be advantageous to hold a series of workshops to discuss matters concerning the effective conservation of the species.

Two meetings took place, in October 2005 and January 2006, to discuss African Lion conservation concerns in west and central Africa, and east and southern Africa, respectively. The meetings were attended by representatives from the wildlife authorities of range States, African Lion specialists, national and international non-governmental organizations, and safari-hunting operators.

Each workshop comprised two parts: a three-day technical session which sought improved understanding of lion status, distribution and threats; and a three-day strategic planning session to develop a regional conservation strategy for lions. The technical session developed a GIS-based assessment of lion status and distribution in Africa, mapping historic and current range as well as identifying priority areas for lions based on threats and viability. Participants of the strategic planning workshops were tasked with developing a vision and goal, as well as a range of objectives, targets and activities. The results of both workshops will be combined into a continental African Lion conservation strategy.

Threats to the survival of lions, for example habitat loss, declining wild prey base, and human-lion conflict, were discussed in conjunction with the economic opportunities that could be realized from lions, for example tourism.

The workshops resulted in agreement to focus on enabling policy, legal and institutional frameworks for wildlife-integrated land use, reducing human-lion conflict, preventing illegal trade in lions and lion products, improving scientifically sound management of lion, developing management capacity and creating incentives to build stronger community support for lion conservation. Trade in African Lion hunting trophies was not considered to be a threat, but rather a significant component of lion conservation and management. Illegal trade in skins and for traditional medicine was identified as a concern.

Claire Patterson, Programme Officer, TRAFFIC East/Southern Africa

Kristin Nowell, IUCN/SSC Cat Specialist Group, and Director, CAT-Cat Action Treasury

TAIWAN CUTS WHALE SHARK QUOTA

Taiwan is taking an important step towards the long-term management of the Whale Shark *Rhincodon typus* fishery by halving its harvest quota from the current 60 specimens to 30 by 2008. This action constitutes the first harvest and monitoring system to be put in place for this species. However, as long as there is a risk of unreported catch entering domestic markets through unofficial channels, this may not be enough to ensure a sustainable future for the species.

Taiwan has been identified as possibly the world's largest market for Whale Shark meat. The species, which is listed as "Vulnerable" by the IUCN Red List and included in CITES Appendix II, is widely distributed in all tropical and warm temperate seas and countries such as Belize, India, Maldives, the Philippines, Seychelles and Thailand have prohibited Whale Shark harvesting to date.

"There is an underlying concern for illegal Whale Shark trade in Taiwan", says Joyce Wu of TRAFFIC's office in Taipei. "For example, 32.5 t of meat reportedly obtained from legal harvests in 2004 corresponds poorly with the 68.5 t of meat reported as sold the same year in just two of the major wholesale fishery markets in Taipei and Taichung."

Such a marked discrepancy between domestic catch data and the volume of Whale Shark meat on domestic markets indicates a considerable volume of imports of fish caught elsewhere, or substantial under-reporting of the catch. According to the Customs statistics, however, no imports of Whale Shark have taken place in the past five years. During TRAFFIC's research on the management of trade in Whale Sharks in Taiwan in 2001, some retailers claimed Indonesia and Hainan Island, China, to be source areas for some of the Whale Shark meat on sale in Taiwan.

"Extra vigilance is now necessary as a change in the harvesting quotas can potentially increase the pressure on illegal imports. It is crucial to monitor closely the markets and continuously assess the trade trends", Wu adds. "A transparent auction and shipping system would assist further in efforts to stop illegal activities and in ensuring a sustainable future for this giant of the sea."

TRAFFIC East Asia

CITES STRATEGIC VISION

LEARNING FROM EXPERIENCE

Adopted in 2000, the first Strategic Plan for CITES was scheduled to draw to a close in 2005. At the 13th meeting of the Conference of the Parties to CITES (CoP13) in October 2004, member governments had the opportunity to assess progress so far and design a process to set goals for the Convention's work for a new period of its development. As a result of these discussions, Parties adopted Decision 13.1 'Strategic Vision' which extended the time validity of the Strategic Vision and its Action Plan until the end of 2007 and established a Strategic Plan Working Group as a sub-committee of the Standing Committee, with the task to develop a proposal for a Strategic Vision and Action Plan through 2013. The terms of reference of the CITES Strategic Plan Working Group were agreed to at the 53rd meeting of the CITES Standing Committee in June 2005 and the Working Group held its first meeting in April 2006 in Ottawa, Canada.

TRAFFIC has been engaged in the process of considering strategic goals for CITES beyond 2005 since 2003, providing input when CITES Parties and interested organizations were asked to provide suggestions to the CITES Secretariat on the new Strategic Vision and its Action Plan in preparation for the 50th meeting of the Standing Committee in March 2004. At CoP13, TRAFFIC and WWF provided further input in the form of a briefing document 'Looking to the future: a call for attention to the CITES Strategic Vision and Action Plan and some suggestions for its future development' (see www.traffic.org/cop13/documents/Strategic_plan.pdf).

In the document, TRAFFIC highlighted a number of important issues for consideration, such as more effective evaluation of the Convention's performance, enhancements to capacity-building and enforcement efforts, increased private sector engagement, reviews of the structure of current CITES institutions and decision-making, and the need for greater attention to wider conservation and development policy context.

In order to enhance governments' efforts to rationalize policies and practices advocated under different multilateral economic and environmental institutions, CITES must be integrated nationally, regionally and internationally with the conservation work pursuant to the Convention on Biological Diversity (CBD) and other multilateral agreements. The CBD has adopted basic targets and indicators and allocation of resources to support ongoing evaluation, and CITES needs to engage in and influence this process so that efforts under each Convention can be complementary and non-duplicative. As part of the revitalized and extended co-operation between CBD and CITES, work on a common set or subset of species indicators would be valuable to both Conventions.

In pursuing this and other ideas for the next Strategic Plan, it is therefore essential that Parties make some effort to evaluate and learn from their achievements and failures over the past years, and to take a serious approach to the monitoring and measuring of the Convention's performance. In a review conducted by TRAFFIC and WWF of the experience and best practice in regional fisheries management organizations, many parallels with the experiences of CITES, particularly with regard to possible structured approaches to assessing the performance of the Convention, have been observed. Such an approach would examine the effectiveness of the Convention with regard to a number of issues, including:

- the active membership that is core to the performance of the Convention, including capacity-building for existing and prospective Parties;
- systematic approaches for collaboration with other multilateral environmental agreements, including supporting structures and mechanisms for such co-operation;
- effective application of the precautionary approach and precaution management measures based on the best scientific advice available;
- effective application and enforcement of compliance measures, including provision for information exchange between Parties as well as strengthening of institutional capacity to analyse compliance and enforcement information; and,
- regular, transparent reviews and evaluation of performance.

There has clearly been significant progress in some areas of the Convention's work over the past five years, including increased membership, improved national implementing legislation, greater emphasis on capacity-building, stronger management and scientific measures, agreement of ground-breaking approaches to policy assessment and some improvement in engagement and collaboration with other multilateral environmental institutions. However, some frustrating challenges remain and it has to be asked whether the steady progress seen is really enough and whether the Convention has all the mechanisms it needs to fulfil its role. Indeed, the ultimate question that the CITES Strategic Plan Working Group must ask is whether CITES is winning the battle it was established to fight.

*Sabri Zain, Advocacy and Campaigns Director,
TRAFFIC International*



WWF-CANON / EDWARD PARKER



BRENT STIRTON / GETTY IMAGES / WWF-UK

NON-WOOD FOREST PRODUCTS

(NWFPs) HAVE AN IMPORTANT ROLE TO PLAY IN THE LIVELIHOODS OF MANY RURAL COMMUNITIES, PARTICULARLY IN DEVELOPING COUNTRIES, WHERE THEY PROVIDE A BROAD RANGE OF SUBSISTENCE AND COMMERCIAL LIVELIHOOD OPPORTUNITIES. EXAMPLES INCLUDE RATTAN, WHICH IS USED LOCALLY IN MALAYSIA FOR BOTH SUBSISTENCE PURPOSES (FOOD, MEDICINE, BUILDING MATERIAL AND FIBRE) AND AS A SOURCE OF CASH INCOME. FOREST-DWELLING MALAYSIAN ABORIGINES TRADITIONALLY UNDERTAKE THE COLLECTION OF RATTAN AND WHILE THE AMOUNT EARNED IS NOT LARGE, IT IS IN MANY CASES THE ONLY SOURCE OF INCOME FOR THESE COMMUNITIES, WHO ARE AMONGST THE POOREST IN ASIA. IN SOUTH AFRICA, THE TAPPING OF THE ALOE SPECIES *ALOE FEROX* FOR THE PRODUCTION OF ALOE BITTERS EMPLOYS THOUSANDS OF SOUTH AFRICANS AND THE REDDISH PULP OF THE ANNATTO SEED, USED AS A FOOD COLOURING, PROVIDES INCOME FOR COMMUNITIES IN MANY COUNTRIES.



WWF-CANON / EDWARD PARKER

Photographs, clockwise from top: Annatto *Bixa orellana* seeds, Belém, Amazonas, Brazil. Annatto is produced from the reddish pulp surrounding the seed and used as a food colouring, for example, for cheese and margarine. Dyak woman weaving rattan *Calamus* sp. into a mat, near Berau, East Kalimantan, Indonesia; a woman transporting a basketful of sago to be washed before being baked in a pit oven, Rhoku village, Western Province, Papua New Guinea. Sago fibre derived from the Sago Palm *Metroxylon* provides a staple food in Papua New Guinea and is a common subsistence crop.

While most of the trade in non-wood forest products (NWFPs) is domestic, for some NWFPs species and products, the international trade is significant and generates income for the resource harvesters and collectors as well as many other actors in the commodity chain. The patchiness of information on the trade in wild plants and animals makes it difficult to estimate total and relative levels of use for both domestic and commercial purposes, and this is complicated by the difficulty in distinguishing between subsistence use and trade for commercial purposes. The value of international trade, for which data are comparatively better, has recently been estimated at USD11 billion a year.

In August 2004, TRAFFIC International was engaged by the Food and Agriculture Organization of the United Nations (FAO) to carry out a global analysis of trade-related instruments influencing trade in NWFPs and their applications and impacts on poverty alleviation and sustainable forest management. Case studies on specific NWFPs in international trade were carried out in Cameroon, Bolivia and Papua New Guinea by other, locally based, non-governmental organizations and the results of these studies were incorporated into the global analysis. Examples of NWFPs studied included, for example, the bark of the African Cherry *Prunus africana* and African Grey Parrots *Psittacus erithacus erithacus* in Cameroon, and Caiman *Caiman yacare* and Brazil nuts (of *Bertholletia excelsa*) in Bolivia. Funding for this important work was provided by the Norway Partnership Programme (NPP) "Forests for Sustainable Livelihoods". A comprehensive report, summarized below, has been produced and is to be published in the near future as an FAO working paper (see below).

Trade in NWFPs that is sustainable, supportive of biodiversity conservation and equitable distribution of benefits to all harvesting individuals and communities faces practical challenges: NWFPs are often small in size, come from many different sites and comprise a far bigger range of species and products than exists for the two key traded wildlife forest resources - timber and fisheries. NWFPs trade is, accordingly, far more complex and difficult to understand and regulate, as NWFPs cannot be successfully regulated as a uniform commodity.

The international trade in NWFPs is regulated through a broad range of trade-related instruments that impose mandatory trade controls. Some of these, such as CITES and certain national species conservation measures, have their basis in the conservation of biodiversity, while others, such as import tariffs or phytosanitary certificates, are used for capturing revenue, or for food health and quality control. There are also many trade-related instruments such as trade rules within the World Trade Organization (WTO) that are based on enhancing trade liberalization, covering a broad range of products in international trade. For these instruments, NWFPs are not the key commodities being targeted and the impacts are not always supportive of sustainable use and trade.

NWFPs trade is also affected by voluntary trade measures developed by the private sector, such as certi-

fication and eco-labelling schemes, that generally aim to achieve biodiversity conservation and the equitable distribution of benefits to the communities for whom such trade plays a key livelihood role.

Trade-related instruments such as CITES, that aim to ensure biodiversity conservation, do not always achieve this goal and in certain cases have had a negative impact both on the species concerned as well as on those whose livelihoods are linked to the trade. For instance Goffin's Cockatoo *Cacatua goffini* was listed in CITES Appendix II in 1981. Income from capture of the birds destined for trade, while only accruing to a relatively small number of people, was ultimately distributed more widely among the villages through onward spending and support to dependants (Jepson, Brickle and Chayadin, 2001). Farmers whose Maize *Zea mays* had been destroyed by the birds saw the revenue from trade as valuable compensation as well as a significant source of additional cash income. Following a ban on international commercial trade in the species in 1992 after the species was transferred to CITES Appendix I, this source of cash income has largely been lost to these people as the species is not popular locally. Farmers continue to trap the birds but, as they can no longer be exported to foreign markets, they are simply killed (MacKinnon, 1998).

There are, however, a number of examples of win-win situations such as in the trade in Vicuña *Vicuña vicugna* wool. Vicuña are wild camelids that inhabit high regions of the Andes of Argentina, Bolivia, Chile and Peru and are prized for their fine wool. Hunting resulted in a decline of the species which led to both a regional agreement by the range States as well as a CITES Appendix I-listing prohibiting international trade. The populations have subsequently recovered to the point where commercial trade, according to certain conditions, is now permitted for a number of populations in all four countries. Communities in Peru have been given progressively more control over Vicuña, initially with use and stewardship rights and expanding to property rights (Lichenstein *et al.*, 1999). In most cases, indigenous communities living in the Peruvian Puna are living below the poverty line and income generated from the sustainable management of Vicuña has significant potential to boost the local economy in the long term. Vicuña populations in Peru increased from approximately 67 000 animals in 1994 to over 100 000 in 1997.

There is increased recognition within the biodiversity conservation sector of the need to incorporate the determination of livelihood impacts into decision-making processes for the regulation of trade in wild plants and animals.

Tariffs are used by both importing and exporting countries as a means of generating revenue and, normally in the case of developing countries, as a protective measure. For instance, where the final products are found or manufactured in these countries, to protect the local collectors/industry. Excessive tax rates can be counter-productive as they may encourage illegal trade in the products in order to avoid the tariff. They also often result in a lower price being paid to collectors and harvesters.

While tariff-based trade measures can have an impact on the trade in NWFPs, the impact of non-tariff measures is probably greater. For instance, phytosanitary controls can become a trade constraint where they cause delays and they are normally more onerous on small co-operatives and local communities who may lack the resources to meet the required standards. Non-tariff import controls can prove restrictive as well as complex and often overlap with each other, creating unnecessary burdens on both enforcement personnel and traders. Further, such a regulatory environment is frequently more open to exploitation.

Certification and labelling schemes have focused mainly on timber products, and the certification of NWFPs has largely been available through forest-related certification schemes for the last five years. Because of this, it is difficult to assess the performance of certification for NWFPs as there are insufficient case studies and sources of information available. In general, NWFPs are not considered ideal for certification programmes as the products are generally traded on a small scale in local markets and where they are traded internationally, it is frequently for a specific industry and on a relatively small scale. Therefore, only some of the more popular products are considered suitable for certification and related initiatives should be carried out on a case-by-case basis.

There are a number of areas where inadequate research has been carried out and inadequate literature exists to determine the impact of the trade-related measures. These include international and regional trade agreements, regional and bi-lateral biodiversity-related agreements, as well as tariff and non-tariff measures. In the latter case, the existing literature needs to be updated.

It is clear that NWFPs play a critical role in the lives of millions of people around the world and that trade-related instruments do have an impact, both positive and negative, on the sustainable use and conservation of NWFPs and the livelihoods of those dependent on them. Resource users, regulators, non-governmental organizations, policy-makers and all other stakeholders accordingly need to continue emphasizing the important role of NWFPs and advocating the adoption of trade-related measures that are supportive of their conservation and sustainable use.

The FAO report will be available online later this year at the NWFP section of the FAO website: www.fao.org/forestry/site/6366.

Markus Burgener, Senior Programme Officer
TRAFFIC East/Southern Africa

NON-WOOD FOREST PRODUCTS : A KEY FACTOR IN SUSTAINABLE LIVELIHOODS

CORK IS A TRULY sustainable product - it is renewable and biodegradable and cork harvesting is an environmentally friendly process during which not a single tree is cut down. As well as providing a valuable source of income to more than 100 000 people, these landscapes also support one of the highest levels of biodiversity among forest habitats. Traditional Cork Oak *Quercus suber* landscapes, which cover approximately 2.7 million hectares of Portugal, Spain, Morocco, Algeria, Italy, Tunisia and France, are under threat from a number of pressures. In particular, the increasing risk of decline in the global cork stopper market for the wine industry, due to the growing use of non-cork substitutes, is threatening to reduce the market value of cork and the incentive to preserve and manage cork oak landscapes (WWF, 2006).

FOREST-DWELLERS IN CAMEROON depend to a large extent on the harvest and trade of NWFPs for their livelihoods. It is estimated that seventy per cent of the total population of the Takamanda Forest Reserve (TFR) area collects NWFPs for consumption and sale, which amounts to an estimated income of USD714 286 per annum to some 15 707 people living in 12 villages within and around the TFR (Sunderland *et al.*, 2004). The harvesters of African Cherry *Prunus africana* bark around the Mount Cameroon Area get approximately seventy per cent of their annual cash income from the activity (Ndam, 2004). Villagers adjoining the Campo Ma'an National Park in Cameroon earn a monthly income of USD45 from the sale of palm oil and raffia *Raphia* (palm) wine, USD60 from the manufacture and sale of rattan (Calamoideae) chairs and USD45 for sales of bush mango *Cordyla pinnata* per household per season (Sonne, 2001). In the humid forest zone of Cameroon, the average monthly income to harvesters of edible palm weevil *Rhynchophorus* larvae is about USD71 and USD50 to retailers of roasted larvae. Such income is significantly higher than the monthly income earned by unskilled workers in urban areas or by the producers of cocoa *Theobroma cacao* (USD28) or coffee *Coffea* (USD50) (Dounias, 2004).

FOR THE FOREST-DWELLING PEOPLE OF BOLIVIA, the most important commercial NWFPs are Brazil nuts (of *Bertholletia excelsa*) and palm heart. In 2002, 21 626 people were employed in the Brazil nut supply chain. Caiman *Caiman yacare* is also an important NWFPs species. The preliminary results of an evaluation conducted by the National Program of Caiman Management in 2005 indicated that approximately 1750 people are employed in the commercialization of Caiman leather.

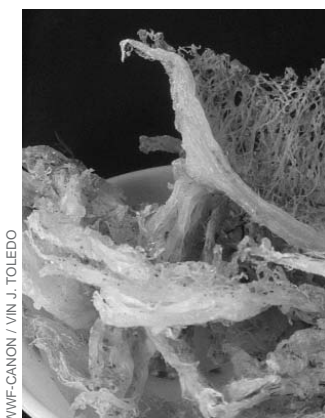
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WWF-CANON / MAURITAUTKARI



WWF-CANON / SEBASTIAN RICH



WWF-CANON / VIN J. TOLEDO



WWF-CANON / EDWARD PARKER

CATEGORY**PRODUCTS** (*species from which products are derived are in italics*)**Food products**

Nuts: Brazil nuts *Bertholletia excelsa*, pine nuts *Pinus pinea*, malva nuts *Malva*, walnuts *Juglans regia*

Fruits: Jujube *Ziziphus* and Ginkgo *Ginkgo biloba*

Edible fungi: Morels *Morchella*, truffles *Tuber* and pine mushrooms *Boletus*

Vegetables: Bamboo shoots and palm hearts

Starches: Sago e.g. *Metroxylon*

Bird nests.

Oils: Shea nuts, babacu *Orbignya* oil, sal or tengkawang or illipe oil *Shorea/Madhuca*

Maple sugar *Acer saccharum*, honey.

Spices and condiments

Nutmeg and mace *Myristica fragrans*, cinnamon *Cinnamomum fragrans*, cassia *Cinnamomum cassia*, cardamom *Elettaria cardamomum*, bay leaf *Laurus nobilis*, thyme *Thymus*, Galanga *Alpinia galanga/Kaempferia galanga*, allspice *Pimenta dioica*, caraway *Carum carvi*.

Industrial plant oils

Oils derived from tung and lumbang *Aleurites*, neem *Azadirachta indica*, jojoba; *Simmondsia chinensis* and kapok *Ceiba pentandra*.

Plant gums

Gums for food uses: Gum arabic *Acacia senegal*, tragacanth *Astragalus*, karaya *Cochlospermum religiosum* and carob *Ceratonia siliqua* gums.

Technological grade gums: Talha and combretum *Combretum* gums.

Natural pigments

Annatto *Bixa orellana* seeds, indigo *Indigofera*, Red Sanders *Pterocarpus santalinus*.

Oleoresins

Pine oleoresin *Pinus*, copal damar *Guibourtia*, gamboge *Garcinia*, benzoin gum *Styrax*, dragon's blood (Benjamin) *Dracaena/Daemonorops*; copaiba oil *Copaifera multijuga*, amber.

Fibres and flosses

Fibres: Bamboo, rattan, xate attap, aren, oster, raffia *Raphia farinifera*, toquilla *Carludovica* straw products, cork *Quercus suber*, esparto *Stipa tenacissima*, *Erica* and other broom grasses.

Flosses: Kapok or silk cotton.

Vegetable tanning materials

Quebracho *Schinopsis*, mimosa *Mimosa*, chestnut, catha (Qat) *Catha edulis*, cutch *Acacia catechu*.

Latex

Natural rubber, gutta percha *Palaquium*, jelutong *Dyera costulata*, sorva *Couma macrocarpa* and chicle *Manilkara zapota*.

Insect products

Natural honey, beeswax, lac (insect resin), mulberry *Morus* and non-mulberry silks, cochineal aleppo galls.

Incense woods

Sandalwood *Santalum*, agarwood *Aquilaria*.

Essential oils

Sandalwood, Jatamansi *Nardostachys grandiflora*, cedar.

Plant insecticides

Pyrethrum *Tanacetum*, derris *Derris*, medang and peuak bong.

Medicinal plants

Ginseng *Panax*, mayapple *Podophyllum peltatum*, yew *Taxus*, yam *Dioscorea*, African Cherry *Prunus africana*, aloes *Aloe*.

Horticulture plants

Orchids *Orchidaceae*, aloes, bromeliads, cyclamens *Cyclamen*.

Animals/animal products

Skins, ivory, trophies, meat, feathers, eggs, medicine, curios, live specimens.

Miscellaneous products

Bidi leaves (e.g. *Diospyros melanoxylon*), soap berries (soap nut) *Sapindus*, Quillai bark *Quillaja saponaria*, cola nut *Cola*, chewing sticks, lacquer, dom nuts or ivory nuts *Phytelephas macrocarpa*.

EXAMPLES OF INTERNATIONALLY TRADED NON-WOOD FOREST PRODUCTS.

Sources: Expanded from Iqbal, M. (1993). International trade in non-wood forest products: an overview. FO: Misc/93/11 Working Paper. FAO, Rome, Italy. Roe, D., Mulliken, T., Milledge, S., Mremi, J., Mosha, S. and Grieg-Gran, M. (2002). Making a killing or making a living? Wildlife trade, trade controls and rural livelihoods. *Biodiversity and Livelihoods Issues No. 6 IIED*, London, UK.

Photographs: Rattan *Calamus* sp., a sustainable resource from a buffer zone next to Kerinci Seblat National Park, Sumatra, Indonesia; cork oak harvesting, Coruche, Ribatejo region, Portugal. The number on the trunk indicates the year of the harvest so that the tree is not stripped again for nine years; swiftlets' nests, El Nido, Palawan Islands, Philippines; rubber tapper scoring the bark of a wild rubber tree. Alto Juruá Extractive Reserve, Acre, Brazil.



WWF-CANON / MICHEL GUNTHER

BROWN BEARS

and TROPHY HUNTING

With a distribution spanning North America, Europe and Asia, the Brown Bear *Ursus arctos*, or Grizzly as it is referred to in most of North America, is the most wide-ranging species of bears, with a global population estimated at around 180 000 individuals. Some 58 000 are in North America and the rest in Eurasia but these numbers and distribution represent only a fraction of what they were a few hundred years ago. In almost half of the Brown Bear's 49 range States, the populations are thought to be declining and human-induced mortality, mainly through hunting, is one of the main causes of these declines.

The Brown Bear is a valuable trophy species, attracting hunters from across the world. It is one of the most popular species for European hunters, and the EU is one of the largest importers of Brown Bear trophies. In order to protect Brown Bears from negative impacts on their populations caused by international trade, whether this be trade in trophies, in parts and derivatives for medicinal purposes, or for other reasons, this species is listed in CITES. The first populations were listed in 1975 and since 1992, all Brown Bear populations are included in either Appendix I (highest degree of protection) or Appendix II. In the EU, all Brown Bear populations are listed in Annex A of *Council Regulation (EC) No. 338/97*, that implements CITES in the 25 EU Member States.

A report by TRAFFIC Europe *Bear necessities: an analysis of Brown Bear management and trade in selected range States and the European Union's role in the trophy trade*, commissioned by the European Commission, brings together information about management, trophy hunting, trophy trade and regulation thereof in nine Brown Bear range States: Bulgaria, Croatia, Estonia, Romania, the Russian Federation, Slovakia, Slovenia, the USA and Canada (British Columbia). The study provides a detailed analysis of the global trade in trophies and reveals that, between 1975 and 2003, over 14 000 Brown Bear bodies, skins, skulls and trophies were reported to be traded, with Canada being the largest exporter, followed by the Russian Federation and the USA. For most range States reviewed, the exported trophies accounted for only a fraction of annual national bear harvests. Together, the 25 EU Member States were the second-largest importers of trophy items after the USA.

< BROWN BEAR *URSUS ARCTOS*

While some studies indicate that trophy hunting creates economic incentives for bear conservation to range States, the EU has, since 1997, raised concerns about the sustainability of imports of Brown Bear trophies into its Member States. The Scientific Review Group (SRG) of the EU examines all scientific questions related to the application of the EU wildlife trade regulations. This includes assessing whether trade has a harmful effect on the conservation status of species, in which case the SRG will give a Negative Opinion to a species/country combination. A Negative Opinion results in an immediate halt of issuance by all EU Member States of import permits for that species/country combination. In recent years, the EU has temporarily suspended the importation of Brown Bear trophies from Canada (from the Province of British Columbia), Croatia, Slovenia, and Romania; the importation of Brown Bear trophies from British Columbia is still not allowed.

This report reviewed the basis of the EU's import restrictions and evaluated the impact of these restrictions on the management of Brown Bears and the trade in their trophies in the nine range States, all of which, with the exception of Bulgaria, the Russian Federation and Slovakia, have a national Brown Bear management plan in place. The differences in management measures and in the amount and detail of information available on Brown Bear status in various range States make it very difficult to compare the situation in any two countries. However, the amount and quality of data for each country do provide an indication of the quality of management plans in place.

The report found that where the SRG has given a Negative Opinion, the basis for the Opinion is mostly related to concerns about the effectiveness of the management measures in place in the country of origin to ensure that the levels of harvest and export are not detrimental. In some instances, the SRG's Negative Opinions have had positive outcomes, for example, they may have precipitated the development of a Brown Bear management plan in Croatia and Romania. However, sufficient implementation of recommended management measures is also important and the SRG has maintained Negative Opinions for British Columbia and, until recently, for Romania, because it did not consider they had gone far enough in implementing their management strategies.

TRAFFIC hopes that this report will provide useful information for anyone studying Brown Bears and will encourage range States who do not yet have a management plan for their bears to develop one.

The report is available on the TRAFFIC website:
www.traffic.org.

Amélie Knapp, Senior Research Officer, TRAFFIC Europe

Indonesia's Exports of Frogs' Legs

Mirza D. Kusri and Ross A. Alford

Indonesia is one of the world's largest exporters of frogs' legs for consumption as food. The majority of the frogs are caught in natural habitat on the island of Java - predominantly the Crab-eating Frog *Fejervarya cancrivora* (75%), and the Giant Javan Frog *Limnonectes macrodon* (19%). While the greater number of frogs taken is for local consumption, the available data show increasing numbers of frogs' legs have been exported from Indonesia over time - from around 28 t in 1969, rising to around 5600 t in 1992 and then declining to around 3800 t in 2002. A strong increase in exports after 1985 corresponded with the banning in that year of exports of edible frogs from India and Pakistan - formerly the principal exporters of frogs' legs. This paper examines the trade in Indonesia based on export data covering 34 years (1969 to 2002) and market surveys and interviews conducted in 2001 to 2003. Although some concern has been raised about the trade, this paper discusses the possibility that the current level of harvest has not depleted Indonesia's population of edible frogs. However, it is not possible at the moment to state that current harvest levels are not a problem as insufficient information is available on production for the substantial domestic market.



Figure 1. Map showing part of South-east Asia, including survey area.

INTRODUCTION

Frogs' legs are widely regarded as culinary delicacies in most regions of the world, including Europe, the USA, Asia and Australia (Jennings and Hayes, 1985; Patel, 1993; Martin, 2000; Schmuck, 2000a; Truong, 2000; Vredenburg *et al.*, 2000; Paltridge and Nano, 2001; Szilard and Csengele, 2001; Török, 2003). Indonesia is one of the primary exporters of frogs' legs (Niekisch, 1986; Martens, 1991; Schmuck, 2000b). Until now, little information has been available on the volume of Indonesia's exports of frogs' legs, data only being available for certain years (Barfield, 1986; Niekisch, 1986; Martens, 1991; Schmuck, 2000b). Gaps in our knowledge of the trade in edible Indonesian frogs make it difficult to evaluate the impact of this trade and its conservation implications. This paper reviews the trade of frogs' legs for export and domestic purposes based on data from Biro Pusat Statistik (Indonesian Statistical Bureau) and interviews with frog harvesters, middlemen and exporters.

METHODS

Species in trade

With the assistance of five field assistants, the authors surveyed local markets in three provinces

(Jakarta, West Java and East Java) to record the species and numbers of frogs sold. Market observations in West Java were mainly carried out in the Bogor and Sukabumi districts; activities in East Java were monitored in the Surabaya, Madiun, Mojokerto and Pasuruan districts (Figures 1 and 2). The locations were selected based on their accessibility and recorded high rates of frog exports. Most of the interviews were undertaken on an informal basis with local traders or middlemen and did not adhere to a standard questionnaire. Each market was observed once during 2001 to 2003.

In order to obtain information on the fluctuations of the harvest, workers were asked whether the harvest had been lower in recent years. This information is crucial because there have been no previous data on the population of edible frogs. Harvesters and middlemen were interviewed mostly in their harvest area, which is in West Java province (Bogor and Sukabumi) and East Java province (Madiun, Mojokerto and Pasuruan).

To assess the size of frog preferred by harvesters and traders, frogs caught by harvesters who had been followed by the study team were measured for their snout vent length (SVL) and mass. The number of harvesters and traders interviewed and observed varied among locations owing to various difficulties in contacting the local harvesters. In total 27 frog harvesters and 23 local people who sell the frogs at markets (some of whom also act



Figure 2. Map of Java showing survey areas.

as middlemen) were interviewed during 2001 to 2003. As there are no official statistics available on the number of frog harvesters and traders, it is not possible to estimate how representative this figure is of their total number.

According to the Ministry of Fisheries, there are some 22 exporters of frogs' legs in Java and Sumatra. The authors were only able to find three exporters who were willing to discuss their business. They were asked about the source of frogs, capture methods, species sold, countries of export and problems relating to export, and revenue. Two exporters were interviewed in Surabaya (East Java) during August 2003, and one exporter who lives in Cirebon (West Java) responded via electronic mail. In addition, in October 2001 one of the authors (Kusri) interviewed a researcher from Balai Budidaya Air Tawar (BBAT - Centre for Freshwater Aquaculture) in Sukabumi (West Java), the institution that was responsible for first introducing the North American Bullfrog *Rana catesbeiana* to Indonesia for the purpose of raising by culture. A bullfrog farmer in East Java was also interviewed during August 2003 to gain information on the problems associated with frog farms, and the extent of development of such farms.

In this paper, the names for non-CITES-listed species are given according to Iskandar (1998).

Export data

Trade statistics recorded by the Indonesian Government between 1960 and 2002 and reported in the *Foreign Trade Statistical Bulletin* by the Indonesian Statistical Bureau were examined. Based on these data, an overall history of the frogs' legs trade was assembled, including information on the major importers, the value of the trade, net weight exported each year, and the locations of major frog sources.

The first available data on exports of frogs' legs are from 1969 and were listed under fisheries products. Between 1969 and 1974 they were categorized simply as frog meat. Since 1975 frog meat has been registered under five categories: 1) meat and edible meat of frogs' legs, fresh or chilled; 2) meat and edible meat of frogs' legs frozen; 3) meat and edible meat of frogs (excluding legs) fresh or chilled; 4) meat and edible meat of frogs

(excluding legs) frozen; and 5) other meat of frogs (Biro Pusat Statistik, 1969-2002). The units recorded in trade are in kilogrammes. However, there is no mention of the species from which the meat or legs are taken. In this account, all forms of "edible frog meat" are included together. While there have been some records of frog meat categorized under "edible frog meats excluding leg" since 1991, the quantity is very small (0.34% of total) and for the purposes of this report have been included with the data relating to frogs' legs.

Harvest estimates for export purposes

Frogs captured by harvesters (N=736) were measured to obtain the correlation between body length (SVL, mm) and body mass (g). In order to estimate the actual take of frogs for export purposes, based on the ratio of wet mass to skinless leg mass for each species, the authors measured SVL, whole wet masses and skinless leg masses of *Limnonectes macrodon* (36 females and 27 males) and *Fejervarya cancrivora* (33 females and nine males) taken randomly from frog harvesters in West Java. The equation to estimate harvest is as follows: $Total\ number\ of\ frogs\ harvested = annual\ mean\ mass\ of\ exported\ frogs'\ legs\ (grammes) / mean\ weight\ of\ pair\ of\ legs^1$.

STATUS

Limnonectes macrodon is listed as Vulnerable in the IUCN Red List (2004) where it states that the species in Indonesia is now considered uncommon, but not yet rare, where previously it was more common.

RESULTS

Species in trade

Three species of native frogs were sold in local markets of Jakarta, West Java and East Java, as well as *Rana catesbeiana* which is raised on frog farms but does not occur in the wild. Of the native species, the larger species (Crab-eating Frog *Fejervarya cancrivora* and Giant Javan Frog *Limnonectes macrodon*) were the most commonly sold. Surveys in East Java only found *Fejervarya cancrivora* and Grass Frog *Fejervarya limnocharis* specimens being traded. However, East Java traders did say that they sometimes sold frogs caught in streams matching the description of *Limnonectes macrodon*.

There are two different end consumers: local consumers who prefer fresh frog meat, and processed and frozen frogs' legs for overseas markets. In local markets, frogs were mostly sold alive as the outward appearance of frogs is important. Specimens of *Rana catesbeiana*

¹While the trade derives from Sumatra for some periods, based on interviews with traders the authors are certain that the same species are being harvested. *Fejervarya cancrivora* is distributed widely in Indonesia. Although scientists believe that *Limnonectes macrodon* is only distributed in Java, taxonomically it was previously put as *L. blythii* or *L. kadarsani*, which are distributed widely in other parts of Indonesia (Iskandar, 1998). These frogs are very much alike in appearance and are the same size as *L. macrodon*. Veith et al. (2000) found that frogs listed as other species harvested from these two islands were actually *Fejervarya cancrivora*.

Species	Sex	No.	SVL (mm)		Std Dev	Mass (gram)		Std Dev
			Mean	Range		Mean	Range	
<i>Fejervarya cancrivora</i>	Female	367	75.10	40.00-162.00	16.89	48.55	2.94-152.40	26.48
	Juvenile	5	35.90	33.50-38.00	1.75	3.93	3.45-4.35	0.35
	Male	183	65.54	50.20-86.20	6.01	29.55	14.50-57.40	8.09
	Total	555	71.60	33.50-162.00	15.23	41.88	2.94-152.40	24.03
<i>Fejervarya limnocharis</i>	Female	16	43.69	30.00-78.00	16.22	10.34	1.87-32.00	12.9
	Male	27	46.24	32.57-70.20	13.75	10.87	2.60-41.00	10.04
	Total	43	45.29	30.00-78.00	14.58	10.67	1.87-41.00	11.04
<i>Limnonectes macrodon</i>		138	80.47	54.74-138.10	12.78	66.41	17.00-146.05	26.49

Table 1. Size and mass of frogs captured by harvesters in West and East Java, Indonesia.

No information on the sex of *L. macrodon* is available owing to the difficulty in distinguishing between the sexes.

were rarely seen in local markets, however a few live specimens were on sale in supermarkets in Jakarta. Interviews with local traders in all markets revealed that most local consumers dislike the taste of *R. catesbeiana* and prefer the native frog species.

Frogs' legs are usually supplied to the exporting companies already skinned, large specimens of *Fejervarya cancrivora*, *Limnonectes macrodon* and *Rana catesbeiana* being the most favoured. The manager of one exporting company stipulated that he should be supplied only with *Limnonectes macrodon* however he admitted that since supplies come in the form of skinless frogs' legs, as long as they are of acceptable size it is possible that they include other species such as *Fejervarya cancrivora*.

Frog size

A total of 736 frogs of three species (*Fejervarya cancrivora*, *F. limnocharis* and *Limnonectes macrodon*) captured by harvesters in West Java and East Java were measured. *Fejervarya cancrivora* made up 75.4% of specimens captured, while only a small percentage was *F. limnocharis* (5.8%) and the rest were *Limnonectes macrodon* (18.8%). Frogs captured were usually mature, except a small number of *Fejervarya cancrivora* specimens which were of sizes considered as juvenile (Table 1).

Traders either categorize frogs into large, medium or small, or use an alphabetized system: A, B and C. Large and medium-sized frogs are placed in Categories A and B, respectively, with 9 to 12 frogs/kg in Category A, or 13 to 25 frogs/kg in Category B, and more than 25 frogs/kg are categorized as C, or small. Frogs' legs that are exported are usually from large and medium-sized frogs (Category A or B) with export prices in 2003 at around USD3-4/kg of skinless frogs' legs or around Rp.25 200-33 600/kg (USD1=Rp.8400).

Levels of income and profit

Harvester income depends on the number or mass of frogs caught, the route taken and skills employed in harvesting. To minimize costs of transportation, harvesters rarely go far from the place where they sell the catch, preferring to walk whenever possible. Other than transportation, additional costs for each trip are for snacks,

coffee and cigarettes. The maximum cost of transportation and snacks (including coffee and cigarettes) that harvesters were willing to spend was Rp.1000/day during the high season. If it is assumed that transportation costs are nil and the price of frogs is constant at Rp.6000/kg (mixed), harvesters could make around Rp.5000-11 000/day (low season) and Rp.11 000-29 000/day (high season) (Table 2). A full-time harvester working for 25 days/month would receive a monthly income of Rp.245 000-635 000. This estimate is probably lower than actual earnings, because harvesters tend to capture bigger frogs (thus increasing their income) and prices fluctuate, and are higher in the low season because of lower supply. Based on interviews, the lowest income of

	Snacks	Min. Yield	Max. Yield	Min. Wages	Max. Wages
low season	1000	1	2	5000	11 000
high season	1000	2	5	11 000	29 000
5 days low season					
in a month	5000	5	10	25 000	55 000
20 days high season					
in a month	20 000	40	100	220 000	580 000
Monthly wages				245 000	635 000

Table 2. Harvester daily wages (Indonesian Rupiah).

Note: The price of frogs is based on the maximum price of mixed frogs (Rp.6000/kg). Wages per day is yield multiplied by price of frog minus food and assuming that transportation costs are nil. Monthly wages refer to wages during low season plus wages during high season.

Species	Condition	Category	Harvester	Consumer	Gross revenue
<i>L. macrodon</i>	each		750	3000	2250
	per kg		10 000	35 000	25 000
<i>F. cancrivora</i>	each	C	150	700	550
	per kg	C	5000	17 000	12 000
<i>F. limnocharis</i>	per kg (skinless)	C	6000	12 000	6000
	per kg	B	5500	20 000	14 500
	each	A	600	2000	1400
	per kg	A	5000	20 000	15 000
	per kg (skinless)	A	10 000	30 000	20,000
	per kg	Mixed	6000	8000	2000

Table 3. Comparative prices (in Indonesian Rupiah) of frogs sold from harvester to local consumer, based on the maximum price available for each stakeholder.

Stakeholder	Sold to	Location	Price of <i>F. cancrivora</i> and <i>F. limnocharis</i>				Price of <i>L. macrodon</i>		
			small	medium	large	mixed	small	large	mixed
Harvester	Middleman	Caringin (WJ)	150 each		600 each			750 each	
Harvester	Middleman	Cibatok (WJ)				6 000/kg		10 000/kg	
Harvester	Middleman	Kelapanunggal (WJ)			10 000/kg		14 000/kg		
Harvester	Middleman	Karangtengah (WJ)	5 000/kg	5 500/kg	6 000/kg				
Harvester	Middleman	Pasar Pelita (WJ)			13 000/kg				
Harvester	Middleman	Ciracap (WJ)				5 000/kg		6 000/kg	
Middleman	Consumer	Caringin (WJ)			750 each		1 250 each		
Middleman	Distributor	Cibatok (WJ)	7 000/kg					13 000/kg	
Middleman	Consumer	Karangtengah (WJ)	12 000/kg	20 000/kg				22 000/kg (B)	
			(B)	(J)				or 25 000/kg (J)	
Middleman	Consumer	Pasar Pelita (WJ)	15 000-17 000/kg					18 000-20 000/kg	
Middleman	Distributor	Ciracap (WJ)	8 000/kg		12 000/kg			18 000/kg	
					(A & B)				
Middleman	Trader	Glodok (J)	6 000-8 000/kg		12 000-15 000/kg		1 000 each	2 500 each	
Middleman	Trader	Senen (J)		20 000/kg* or 1 500 each	350 00/kg* or 2 000 each			20 000/kg	
						8 000/kg		20 000/kg	
Middleman	Trader	Senen (J)	7 000/kg		17 000/kg			20 000/kg	
Middleman	Trader	Petak sembilan (J)			15 000/kg			20 000/kg	
Trader	Consumer	Glodok (J)	15 000/kg* or 500-700 each		25-30 000/kg* or 20 000/kg		1 500 each	3 000 each	
Trader	Consumer	Senen (J)	15 000-25 000/kg* or 12 000-20 000/kg		25 000/kg			3 500/kg	
Trader	Consumer	Petak sembilan (J)		1 000 each	25 000/kg or 2 000 each			30 000/kg or 3 000-4 500 each	

Table 4. Price of frogs (in Indonesian Rupiah) in Jakarta and West Java according to buyers, 2002 and 2003.

Note: *mean price for skinless legs, otherwise price for live frogs: (B)=Bogor, (J)=Jakarta (WJ)=West Java

Stakeholder	Sold to	Location (East Java)	<i>Fejervarya cancrivora</i> and <i>Fejervarya limnocharis</i>			
			small	medium	large	mixed/skinless
Harvester	Middleman	Madiun				13 000/kg
Harvester	Middleman	Madiun			9 000/kg	
Harvester	Middleman	Madiun/Magetan			10 000/kg	
Harvester	Middleman	Mojokerto				8 000/kg (high season) 12 000/kg (low season) live
Harvester	Middleman	Pasuruan	6 000/kg		10 000/kg	
Harvester	Middleman	Sidoarjo			10 000/kg (live)	
Middleman	Consumer	Madiun				10 000/kg
Middleman	Consumer	Madiun	10 000/kg	15 000/kg	25 000/kg	
Middleman	Consumer	Madiun	10 000/kg		25 000/kg	
Middleman	Distributor/Exp	Madiun	7 000/kg	15 000/kg	20 000/kg	
Middleman	Consumer	Madiun/Magetan	12 000/kg		22 500/kg	
Middleman	Consumer	Mojokerto			25 000/kg	
Middleman	Consumer	Pasuruan			15 000/kg (live)	
Middleman	Consumer	Pasuruan			25 000/kg	
Middleman	Consumer	Sidoarjo	1 500/each	2 500 each	3000 each	
Exporter	Consumer					25 200-33 600/kg (USD3-4, 1 USD=Rp. 8400)

Table 5. Price of skinless frogs' legs in East Java (in Rupiah) unless stated as other form, 2002 and 2003.

Period	Annual mean mass of frogs' legs (kg '000s)	Annual range number of frogs taken (individuals '000s)		Annual mean number of frogs taken (individuals '000s)	
		A	B	A	B
		1969-1978	1 402	10 176-52 019	12 794-38 607
1979-1988	2 878	20 884-106 756	26 256-79 232	75 462	43 144
1989-1998	4 302	31 214-159 561	39 243-118 423	113 056	64 484
1999-2002	3 831	27 796-142 088	34 946-105 455	100 676	57 423

Table 6. Annual mean volume of frogs' legs exported and predicted number of frogs taken for export.

A = SVL between 89-162 mm, mean 101.43 mm and B = SVL between 100-150 mm, mean 125 mm

a full time harvester was Rp.450 000/month whilst the highest was 900 000/month.

For middlemen, the gross revenue for each type of frog varied (see Tables 3-5). Middlemen and traders must also spend substantial amounts of money for fixed costs, such as equipment, carbide or batteries, transportation to carry frogs to traders or local markets, and the hiring of people to cut and skin frogs. Middlemen who had connections with exporters usually did not need to cover the costs of transportation since exporters usually come to the middleman. However, interviews revealed that only some middlemen distributed their frogs' legs to exporters. Exporters usually have higher quality control. Interviews with exporters revealed that at least 2-5% of frogs' legs coming from middlemen were usually rejected for various reasons such as the occurrence of bruises or parasite infection. One of the middlemen interviewed remarked that he had lost a substantial amount of money because more than 30% of the last batch of frogs' legs he sent were rejected. This caused him to leave the export market and concentrate on the local market, which he said was much more flexible. Other middlemen used a combination of approaches, catering for both local and export markets. Frogs that are too small for export are sold in local markets. The net revenue for middlemen and traders varies, ranging from Rp.100 000/day to Rp.600 000/day.

Frogs in local markets were sold either by number (when live) or by mass (either the whole frog or as skinless legs). Prices recorded for the years 2002 and 2003 varied according to species, size, location, stakeholders, and season (Tables 4 and 5). In East Java consumers paid Rp.1500 (small) to Rp.3000 (large) for each live frog, and Rp.6000-Rp.25000 per kg of skinned frogs' legs. Whereas in Jakarta, small frogs harvested from rice fields were sold for Rp.750 each and large frogs sold for up to Rp.25 000 per kg of whole live frogs. The price of *Limnonectes macrodon* was usually higher than that for rice field frogs. In West Java and Jakarta specimens of this species were usually sold live by number or by weight. The cheapest *L. macrodon* specimen sold to consumers was in Bogor (Rp.1250/frog) compared to Jakarta, where prices ranged from Rp.1500 (small) to Rp.3000 (large)/frog, or around Rp.25000/kg.

Profiles of exporters

Companies that export frogs' legs usually also export other fisheries products such as prawns and fish. Twenty-two companies, employing 3596 people, were listed by the government as exporting frogs' legs in 2000 (Ministry of Fisheries, 2000). Almost two thirds (14) of these companies were based in Java, which on average employed 188 people each; the rest were in Sumatra, where an average of 132 people were employed at each company. This number fluctuates from year to year. After trying for two years to track down some of the companies, the authors found that some of them had closed down and that others they encountered were not listed at all. Managers from two exporting companies that were not listed were inter-



THE CRAB-EATING FROG *FEJERVARYA CANCRIVORA* MADE UP THREE-QUARTERS OF THE SPECIMENS HARVESTED DURING THE STUDY PERIOD.

viewed - one company started in 1972 and the other in 1999. Both companies export other seafood products, mainly prawns and lobsters.

According to these sources, exported frogs mostly came from East Java (Kediri, Madiun, Nganjuk, Bojonegoro, Pasuruan, Jombang, Madura), but also from West Java (Tasikmalaya and Cirebon), central Java (Solo, Cilacap), and locations outside Java such as Lampung (southern end of Sumatra), Bali and south Kalimantan (Banjarmasin). The managers from the two aforementioned companies declared that they rely mostly on supply from adjacent areas, however they would sometimes obtain frogs from other islands, especially during periods of low supply. Most frogs are removed from natural habitat, and only a small number come from frog farms.

Exporting companies usually have cold storage, processing and packaging facilities. They operate at least six days a week and employ 30 to 50 full-time workers, or more if the demand is high. Frogs are processed in compliance with international quality standards (Ministry of Agriculture, 1993). An appointed laboratory usually tests the frogs for bacteria, parasites and other pathogens such as *salmonella* before they are cleared for export.

The estimated number of frogs harvested and exported from Indonesia

Data were examined for the years 1969 to 2002. Exports of frogs' legs from Indonesia fluctuated greatly but the trends show an increase in most years between 1969 (2800 t) and 1992 (5600 t), especially during the period 1985 and 1992 (Figure 3). Exports decreased after 1993, and showed a downward trend until 1999, after which there was a limited increase. The average annual volume increased two-to-three-fold between 1969 and 1978 and the post-1980 years (Table 6).

There was a significant difference in the ratio of wet mass to skinless leg mass between *Fejervarya cancrivora* and *Limnonectes macrodon* ($F_{(1,102)}=75.509$, $P < 0.001$; Table 7). However, since export data are not presented separately by species, the authors used the combined estimates of mean mass per pair of legs and mean total mass of frog per mass of legs to estimate numbers of frogs and total mass of frogs removed from the wild.

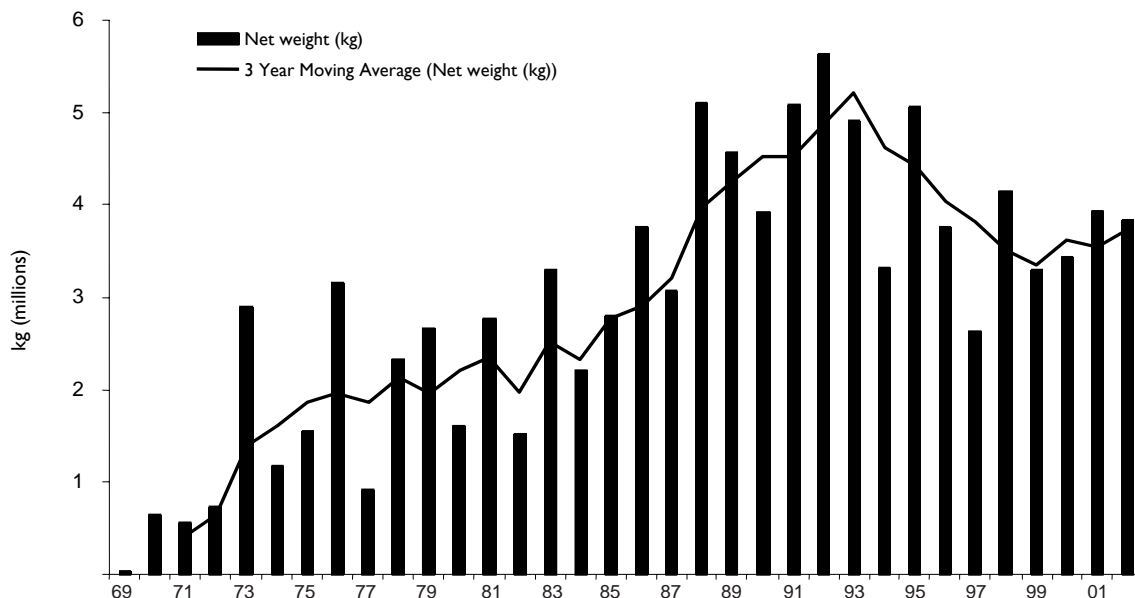


Figure 3. Frogs' legs exports from Indonesia, 1969 to 2002.

Source: Biro Pusat Statistik (BPS), 1969-2002.

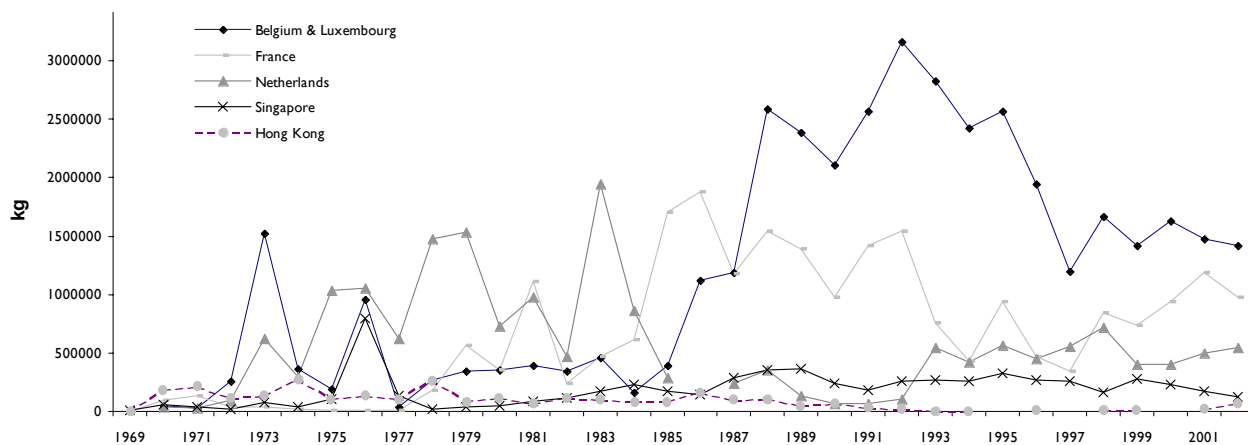


Figure 4. Destinations of exported frogs' legs, 1969-2001. Source: Biro Pusat Statistik (BPS), 1969-2000.

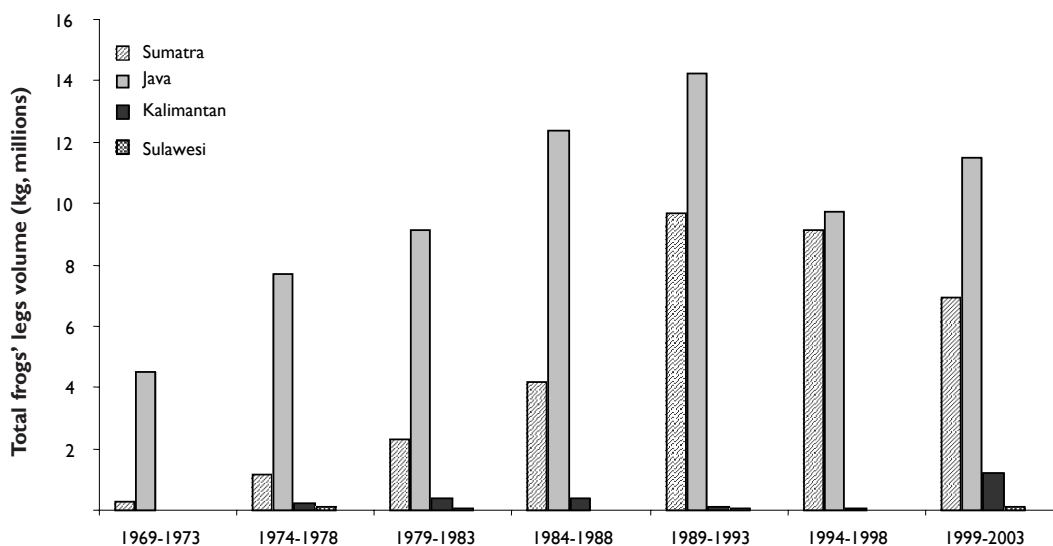


Figure 5. The volume of frogs' legs exported from Sumatra, Java, Kalimantan and Sulawesi, Indonesia.

Source: Biro Pusat Statistik (BPS), 1969-2000.

Species	Number	Mean	Std Deviation	Range
<i>Fejervarya cancrivora</i>	42	0.3208	0.03143	0.25 - 0.41
<i>Limnonectes macrodon</i>	63	0.4160	0.06751	0.21 - 0.65
Total	105	0.3772	0.07272	0.21 - 0.65

Table 7. The proportion of whole body mass accounted for by leg mass in *Fejervarya cancrivora* and *Limnonectes macrodon*.

On average a frog's legs account for 37.7% of its total weight (Table 7). The correlation between total weight and length was estimated based on regressions² taken from mature *Fejervarya cancrivora* and *Limnonectes macrodon* specimens captured by harvesters that the authors observed in West Java and East Java. The equation is: $\text{Log Weight} = 2.724 * \text{log SVL} - 3.456$ ($F_{(1,794)} = 5028.869$; $P < 0.001$). Estimates were made in two ways:

1) Using data from harvesters for frogs with body masses of at least 80 g, it was estimated that the SVL of exported edible frogs is between 89-162 mm with a mean of 101.43 mm. Since data were taken from harvesters who mostly cater for domestic consumption, the SVL assigned here might be biased to smaller frogs. Predicted total weight: range 71.41-365.36 g, mean = 100.87 g. Predicted weight of pair of legs (total weight x 37.7%): range 26.96-137.81 g, mean = 38.05 g.

2) Presuming that frogs taken for export might be larger, it was estimated that the SVL of edible frogs is 100-150 mm with a mean of 125 mm. Predicted total weight: range 98.17-296.26 g, mean = 180.29 g; Predicted weight of a pair of legs (total weight x 37.7%): range 36.32-109.62 g, mean = 50.56 g.

Based on the above equation, the estimate ranges widely. For instance, the mean number of frogs exported annually during 1989 to 1998 is estimated as being in the range of 31 to 160 million frogs a year, depending on the length of frogs used in the equations (Table 6). However, the actual number of frogs taken was probably higher than recorded. The skinning of frogs' legs destined for export markets is either carried out by the middleman or, more usually, by somebody employed by him, before the frogs' legs are sent to exporters; only specimens with no bruises or other imperfections are accepted by the exporters. Because frogs are usually captured using a net on a long pole, some are inevitably bruised. Frogs' legs rejected by exporters are not usually kept for domestic consumption either since the domestic market favours live frogs. The number of frogs' legs rejected by exporters varied from two to five per cent of the total number of frogs caught, although one middleman remarked that he had once rejected as

much as 30%. Upon further questioning, it became apparent that the high incidence of rejection was likely to be attributed to this middleman's lack of experience in exporting frogs.

Destinations of exported frogs' legs

In total, some 36 jurisdictions imported frogs' legs from Indonesia from 1969 to 2002. Ten of these were in Asia (China, East Timor, Hong Kong, Japan, Malaysia, Pakistan, Singapore, South Korea, Taiwan and Viet Nam); two in the Middle East (Bahrain and Egypt); 14 were in Europe (Austria, Belgium and Luxembourg, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland, and the UK); four were in Latin America and the Caribbean (Brazil, Ecuador, Mexico, and Bahamas); two in North America (USA and Canada) and at least four in Pacific countries (Australia, Papua New Guinea, New Caledonia and other countries in Oceania). Although Belgium and Luxembourg are separate countries, they are combined as one entity in the statistical reports.

Europe was the major importer of Indonesian frogs' legs (83.2% of the total exported), with Belgium and Luxembourg the principal destination (47.6%), followed by France (27.6%) and the Netherlands (21%). Export to Europe tended to fluctuate but increased dramatically after 1985. The second-largest importer was Asia (around 12%), with the majority going to Singapore (50.5%), Hong Kong (22.9%) and Malaysia (18.3%). Export to Asia tended to increase slightly after 1985 and stabilized at around 500 t annually from 1988 (Figure 4).

The results reported above correspond with those arising from the interviews. All exporters reported that most exports go to Europe (Belgium, France, Netherlands, and Switzerland) and a small number to the USA and Singapore. They also reported that demand for frogs from overseas has been increasing and that it was sometimes hard to meet demand owing to limited supplies, particularly during the dry season (February to August). Large increases in demand occurred during the 1980s; from the 1990s to date the market has been relatively constant, increasing at slow rates as compared to the 1980s.

²the relationship between two random variables (in this case total weight and length) with a straight line fit to the data. The linear regression model postulates that $Y = a + bX + e$. Where the "residual" e is a random variable with mean zero, the coefficients a and b are determined by the condition that the sum of the square residuals is as small as possible.

Species	Mass < 80 g		Mass > 80 g	
	No.	%	No.	%
<i>Fejervarya cancrivora</i>	504	90.8	51	9.2
<i>Fejervarya limnocharis</i>	43	100.0	0	0.0
<i>Limnonectes macrodon</i>	99	71.7	39	28.3
Total	646	87.8	90	12.2

Table 8. Number and percentage of frogs captured in Category A (body mass > 80 g) and other categories (body mass < 80 g), based on harvest from West Java and East Java, Indonesia.

The origin of exported frogs' legs

Based on interviews with exporters, most frogs come from the island on which the company operates, although some frogs originate from other islands. Since it is difficult to estimate the number taken from each province, it is assumed that frogs originated on the islands on which exporters are based. On this basis, it is likely that most exported frogs come from Java and Sumatra.

Export records show that there are 19 ports of export. These are situated on five main islands: Java (7 ports), Sumatra (11 ports), Kalimantan (3 ports), Sulawesi (one port) and Bali (one port). Based on interview data, the majority of frogs' legs from Java were exported from ports in three provinces - Jakarta, East Java and central Java - and most frogs' legs from Sumatra originate in north Sumatra and south Sumatra provinces. The contribution of frogs' legs from Sumatra to the total number of exports increased over the study period as the contribution from Java decreased; however during 1999 to 2003 the contribution from Java rose again (Figure 5).

There are no data to show whether exported frogs originated from frog farms or were removed from the wild. There is no farming of native species. The frog farm industry in Indonesia began in 1982 with the introduction of *Rana catesbeiana* as part of an Indonesian Government programme to increase frogs' legs exports (Susanto, 1989). In 1999, the government, through the Ministry of Fisheries, launched a programme to increase fisheries production for export (PROTEKAN) by developing various aspects of fisheries commodities, including freshwater aquaculture, by 2003. The freshwater aquaculture industry is primarily directed at three commodities: *Tilapia Tilapia*, *Rana catesbeiana*, and freshwater turtles. The Directorate General of Fisheries (1999) estimated that frog farms might produce 1650 t/year by 2003, which is around one third of the volume of annual mean frogs' legs exported during the period 1999 to 2002. However, discussion with staff from BBAT and one frog farmer in East Java revealed that many farmers had stopped farming *Rana catesbeiana* because of high maintenance costs and vulnerability of the species to disease. This indicates that frog farms are unlikely to contribute substantially to future exports.

Domestic trade

Determining the total extent of the frogs' legs trade in local markets is difficult because the number of markets is not known; nor is the number of sellers. The survey found at least 15 local markets in Jakarta selling frogs' legs. Two of five large supermarkets surveyed in Jakarta were selling live frogs and in much lower numbers than at local markets. Unlike for exports, there are no records kept on the number of frogs sold domestically. Assuming that the export market uses large frogs (Category A, maximum 12 frogs/kg wet weight, each frog weighing approximately 80 g) almost exclusively, the proportion of captured frogs that enter local markets can be estimated as being the proportion of those captured that do not fall into this category, or approximately 88% of frogs (Table 8). This suggests that the local market could be at least seven times as large as the export market. However, there is reason to believe that the assumption about trade focus on Category A specimens only might be incorrect. If Category B frogs are also exported, then the local market, while still representing a substantial level of use, might in fact be only twice as large as the export market. The actual size of the domestic market is therefore uncertain.

As the world's major exporter of frogs' legs, Indonesia's frog harvest has been the subject of concern by several investigators of the trade (Barfield, 1986; Niekisch, 1986; Martens, 1991; Patel, 1993; Schmuck, 2000). Much of the debate on this trade has focused on the harvest for international trade and has ignored the fact that domestic consumption could also be high. The estimated numbers in trade show that the domestic trade should be taken into account during efforts to manage this harvest.

Sustainability

Ten out of 13 harvesters in East Java and nine out of 14 harvesters in West Java remarked that yield per year tends to decrease. Almost all (90%) middlemen in East and West Java noted the same trend. However, traders and exporters did not share this perception; they only remarked that sometimes supplies were low depending on the season. Harvesters and middlemen believe that the declines they have noticed are caused by: 1) increasing numbers of harvesters; 2) increasing numbers of middlemen, allowing harvesters to go to other middlemen; and, 3) habitat change, as more rice fields have been developed for other uses.

DISCUSSION

The mean weight of frogs captured varied among species, however it is clear that harvesters select frogs based on their size. Frogs taken for export were usually large mature individuals. However, for local consumers, size is not important and can include young mature frogs. The SVL at maturation of *Fejervarya cancrivora* is around 45 mm for females and 50 mm for males (Jaafar, 1994).

FROG HARVESTING IN INDONESIA

Frog harvests in Indonesia occur throughout the year; however the rate of harvesting fluctuates. Peak harvests occur during the wet season and when there is no moon visible. During the peak season the number of harvesters tends to rise as part-time harvesters enter the workforce. Harvesting is not a highly skilled job and provides a substantial income for unskilled workers. Lights powered by carbide or batteries are used to help in the capture of frogs. This has led to this occupation being called *pengobor* (West Java) or *penyuluh* (East Java), which literally means men who use torches. To capture frogs, most harvesters walk in or along areas of frog habitat such as rice fields, small fish ponds, ponds inside forested areas, and irrigation ditches near sugar cane or along river banks. Only one harvester from Sukabumi (West Java) indicated he caught frogs while using a dinghy on the River Cikarang.

Frog harvesting in rice fields is limited by the stage of rice-plant growth. However, rice fields are considered as areas open to the public and there is no need to ask permission from rice field owners to capture frogs, provided the rice plants are not damaged during the process; in order to minimize any damage, the harvesters rarely venture inside the rice blocks except during certain times, for example, after rice has been harvested. Thus their capture effort is usually limited to areas within a one-metre radius of the block borders, which also serve as pathways. Harvesters from other areas usually bring identification and sometimes ask permission from heads of villages.

The total distance traversed during searches is up to 10 km a night. Working time usually starts at around 7.00 p.m. and finishes around 1.00 a.m. The route taken is rarely far from harvesters' homes or from the middleman's area of operation; this minimizes travel costs. Harvesters use a long bamboo pole with a net at the end (West Java) or a long bamboo pole with a three-headed spear (East Java). The long pole helps harvesters to capture frogs that are further from where they are standing. The three-headed spear is useful for capturing frogs hidden in crevices. Harvesters usually try to avoid spearing frogs in their legs because the resulting bruises would lead to the specimens being rejected, especially for export purposes. However, sometimes it is difficult to avoid such injury, especially when frogs are hiding. Captured frogs are then placed in special bags.

West Javan harvesters avoid frog mortality during capture because frogs are usually sold alive. In the local markets, live frogs are sold in a bundle of 10; the customer selects a bundle and chooses whether to have the frogs killed and skinned at the market or to bring them home alive. Most customers prefer that sellers cut the legs off the frogs; the remaining body parts are usually discarded. Smaller frogs are usually sold in kilogrammes as skinless legs. Other frog products sold at the markets include skin chips (for snacks) and dishes with frogs' legs as the primary ingredients.

East Javan harvesters do not care whether frogs are alive or dead since most captured frogs are destined for export and are usually passed on to middlemen. As soon as the middlemen weigh their catch, the frogs' legs are removed and skinned by the middlemen or, more usually, by someone employed by them. The middlemen then despatch the skinned legs, packed in ice, to the exporting companies. There, each frog's legs are sorted according to size and quality. Bruised legs are discarded. Those that are of an acceptable quality are washed and weighed and arranged in trays, after which they are packaged and frozen.



REDDY RACHMADY



ANI MARDIASTUTI



ANISA FITRI



IAN BUDARTO

PHOTOS FROM TOP:

HARVESTING FROGS BY TORCHLIGHT IN CARINGIN, WEST JAVA;

A BUNDLE OF 10 FROGS ON SALE IN A LOCAL

MARKET IN BOGOR, WEST JAVA; SKINNED FROGS' LEGS IN A LOCAL

MARKET IN JAKARTA; FROGS' LEGS BEING PROCESSED

IN EAST JAVA.

The authors found that the most commonly harvested edible frogs are *F. cancrivora* and *Limnonectes macrodon*. Both are large species and could be found in areas accessible to harvesters. They are probably the species most frequently caught for export purposes, especially in Java. However, based on the surveys where *Fejervarya cancrivora* are predominant in the harvest, it may be likely that this species is harvested the most as indicated by Veith *et al.* (2000). *Fejervarya cancrivora* is at its most widespread in habitats associated with humans and is the most common frog found in rice fields (Church; 1960; Alcalá, 1962; Berry, 1975; Jaafar, 1994; Iskandar, 1998).

Although East Javan harvesters mentioned the occurrence of stream frogs that match the description of *Limnonectes macrodon*, the surveys in East Java were carried out during dry periods in which most streams were at low levels, and considered by harvesters as unsuitable periods for harvesting stream frogs. Thus, this species was not sighted in markets or in the catches of frog harvesters in East Java. Additional analysis of specimens in the Zoology Museum in Bogor revealed no specimens of this species from East Java. Iskandar (1998) mentioned that this species is endemic in Java and could also be found in southern Sumatra. There are several possible explanations for the absence of this species from museum and frog-harvester collections: the species may occur in East Java but simply not have been encountered in the surveys under discussion, or by museum collectors, or, species traded in East Java could be other species from the same family.

It is not clear from the statistics which species are taken for the frogs' legs trade or in what numbers. As the frogs' legs are usually exported without their skins, the species are difficult to identify. Even if they were identified, the documentation in export papers may be incorrect (Veith *et al.*, 2000). The species that are harvested are likely to vary among locations. As an archipelago, Indonesia consists of several large islands, each with its own unique fauna. There is a possibility that frog species taken from outside Java could be species other than the four already mentioned above.

Although more than 20 years have passed since *Rana catesbeiana* was introduced to Indonesia for frog farming, there is no indication that bullfrog farming has succeeded. It appears that most supplies of frogs' legs derive from frogs taken in natural habitat rather than produced in frog farms. From an ecological point of view, the introduction of bullfrogs to Indonesia was unwise. *Rana catesbeiana* is a predator and is known to prey on local frogs where it has been translocated in the USA, and is implicated in the decline of populations of some frog species (Moyle, 1973; Hayes and Jennings, 1986; Lanoo, *et al.*, 1994; Lawler *et al.*, 1999). There is no evidence that *Rana catesbeiana* has become established in the wild in Indonesia, although Iskandar (1998) mentioned that this could happen. This species was not seen during the course of this study. However, apparent lack of control of frogs by frog farmers makes it possible that this frog may spread into natural habitats. Two harvesters from Sukabumi indicated that they had found



bullfrogs in rice fields at least once. It is also possible that this frog may spread diseases to wild frogs. Mazzoni *et al.* (2003) found mass mortality caused by *chytridiomycosis* in farmed *Rana catesbeiana* in South America.

While some exported frogs were probably transported between islands, it is likely that almost all originated on the island where each exporting company operates. This is mainly to ensure a continuing supply of fresh frogs and lower transportation costs. Even assuming that 20% of frogs from Java could have originated from other nearby islands, data analyses still show that harvest from Java is always bigger than that of Sumatra. The greater number of frogs taken from Java is likely to be correlated with the fact that Java has the largest area of rice fields of all Indonesia's islands, which are the most suitable habitat for edible frogs and the areas most accessible to frog hunters.

Based on the findings of this study, the major European importer of Indonesia's frogs' legs since 1988 has been Belgium and Luxembourg, although Patel (1993) found that France was the principal recipient of Indonesia's frogs' legs exports before the 1990s. Data show that frogs caught for export purposes rose significantly between 1969 and 1988. In 1985 two edible frog species from India and Bangladesh (*Rana hexadactyla* and *Rana tigerina*) were included in CITES Appendix II owing to the decline in their populations (Abdulali, 1985; Pandian and Marian, 1986; Dash and Mahanta,



1993). Comparison of export data of Indonesian frogs' legs with those for India and Bangladesh shows that Indonesian exports rose markedly as exports from Bangladesh and India decreased, as suggested by Schmuck (2000b).

Because the majority of the Indonesian population are Muslims (85% based on a 2002 census) and Islam forbids the consumption of amphibian meat, frogs' legs are not a major food for Indonesians. Assuming that most of the remaining 15% (non-Muslim) of the 234 million people in Indonesia (BPS, 2002) do eat frog meat, the domestic market may still be substantial, with up to 35 million potential consumers. Still, almost half of non-Muslim Indonesians are ethnic Chinese and, based on interviews and market surveys, like to eat more frog meat than other non-Muslims. The estimation that higher numbers of frog are harvested for domestic markets means that attempts to regulate the harvest of frogs' legs will be impossible without acknowledging the already established domestic market for frogs' legs and the stakeholders. Harvesting occurs on almost all Indonesian islands, making law enforcement difficult. Even if an export quota were set, controlling the domestic market will be complicated and most likely will not succeed. The majority of harvesters are uneducated and poor and will not accept quotas or acquiesce if the practice of harvesting frogs - which has provided livelihoods for many years and is not objected to by most rice field owners - is controlled or stopped by the government.

It is clear from the surveys that frog harvests are economically important. There is always a high influx of new harvesters and traders and there is obviously increased competition among harvesters and middlemen. This is likely to lead to declines of frog populations if it continues. However, it is unclear whether edible frog populations in Indonesia, especially in Java, are in decline. Interviews did indicate that lower numbers of frogs were caught by each harvester and traded by each middleman, however this could reflect stable frog populations and total harvesting rates, spread across an increased number of harvesters and traders.

Data from India suggest that the number taken for export before the ban in that country was around 60 million individuals a year (Pandian and Marian, 1986). Although the total estimate ranges widely (Table 6), it suggests that the annual mean number of frogs harvested in Indonesia is larger than it was in India. This does not necessarily mean that the Indonesian species are threatened by harvesting. They differ in breeding regimes, environmental conditions, and available area of habitat.

Few data are available on the biology, conservation status, and rates of harvesting of Indonesian edible frogs. Although there was concern that *Fejervarya cancrivora* seems to be hard to find in some rice fields (Schmuck, 2000a; Veith *et al.*, 2000), it is difficult to say that the species had declined in some areas considering that *F. cancrivora* is difficult to catch and moves to other rice fields, especially during dry periods. A population study of *F. cancrivora* in West Java showed that the populations are relatively large (39.76 individuals/ha) and there is an indication that the low capture rates of this species

reflect its ability to avoid capture, rather than indicating low population sizes (Kusrini, unpublished data).

Both *Fejervarya cancrivora* and *Limnonectes macrodon* have a high reproductive rate and breed all year long (Sugiri, 1979; Premo, 1985; Jaafar, 1994). *Fejervarya cancrivora* thrives best in man-made habitat - in this case, rice fields. It is found most abundantly in rice fields rather than natural habitat such as ponds and streams. It has the ability to survive the harsh conditions of rice fields where it thrives along with *F. limnocharis* (Kusrini, unpublished data). Although it could not be said that the rice fields are a specialized place for the captive breeding of frogs, it is obvious that humans have provided a suitable non-natural breeding habitat for this species. Thus, a large population of *F. cancrivora* is assured with the availability of rice fields.

During the last four years for which data were available (1999 to 2002), the level of exports of frogs' legs declined slightly. This decline does not necessarily indicate declining harvests, but may reflect a shift from international to domestic markets, or a reduction in international demand. Domestic markets offer a simpler structure, with no limits on the size of frog and the possibility of a greater profit to middlemen than is provided by international markets. Because of the unregulated nature of this product, the size of individual frogs taken is governed by market demand. Smaller frogs are acceptable in the domestic market and are more plentiful than larger frogs: the smaller species like *Fejervarya limnocharis* and some of the smaller-sized, subadult specimens of *F. cancrivora* are easier to harvest and their availability in the field is not as dependent on the season as is the case with *Limnonectes macrodon*, which is rare during the dry season. Furthermore, middlemen also sell large frogs to customers in the domestic market and to restaurateurs. The incentives derived from selling large frogs to local markets are the same as those gained from selling to exporters, but without the added cost of transportation to factory or ice packing, for example. Thus the middleman profits more from focusing on domestic trade, and selling large and small frogs.

While this study focuses on the trade from Java island, the results are likely to give the overall picture of frogs' legs trade in Indonesia. Specimens are harvested mostly from rice fields, where they are at their most abundant and access for hunters is easier, or from areas near human habitation, rather than forested areas. The same trend is probably true for other islands. It is recommended that monitoring of the frogs' legs trade should occur not only in Java but also from other mainlands, especially Sumatra.

This study indicates that most harvest of frogs in Indonesia for export purposes occurs in Java. The island comprises less than 10% of the total area of Indonesia and yet contains sixty percent of the nation's population. The demand for land for development makes Java's rice fields vulnerable to change (Whitten *et al.*, 1997). Faced with the likelihood of reduced rice fields in Java in the future, the harvest for export will doubtless shift to other islands, such as Sumatra, Bali, Kalimantan and Sulawesi.

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A Study on the Trade in Dried Abalones in Hong Kong

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Abalones *Haliotidae* are edible marine molluscs, the meat of which is highly prized as a luxury food item worldwide. A large proportion of the trade takes place in Asia, especially China, where dried abalone has been prized for millennia. From 1997 to 2001, Hong Kong Special Administrative Region (SAR) was the largest importer and re-exporter of dried abalones, accounting for 48% and 100% of the global import and re-export quantities, respectively. Nearly 80% was consumed locally or stockpiled for future trade. This study, which reviewed trade statistics covering the years 1992 to 2003 and which involved market surveys, identified four species of dried abalone in Hong Kong: *Haliotis discus discus* and *H. discus hannai* from Japan, *H. midae* from South Africa, and *H. mariaae* from the Middle East. Unsustainable fisheries and over-exploitation of abalones are affecting the abalone stocks of most countries with abalone fisheries or aquaculture. This review shows that the commodity categories in the trade statistics in Hong Kong, as well as the global trade statistics held by the Food and Agriculture Organization of the United Nations (FAO) are not detailed enough to allow accurate assessment of the trade. A review of these trade categories is urgently needed.

INTRODUCTION

The international trade in abalones *Haliotis* spp. is primarily driven by the demand in Asia, notably China, Japan and Singapore (Fleming, 2003). Over-exploitation of wild abalones has been reported in many abalone-producing countries (Huang, 1998; Prince and Shepherd, 1992; Tarr, 1992; Stephens, 2003; Godfrey, 2003; Hancock, 2004). Gordon and Cook (2004) collected anecdotal records of illegal catches in major abalone-producing countries and estimated that the world illegal catch of abalones has been increasing since the late 1990s and reached a record high of 3690 tonnes (t) (in-shell weight) in 2002, equivalent to 42% of the world cultured abalone production for that year. The USA and South Africa used to be the leading countries involved in abalone fisheries. The former closed its commercial fishery entirely in 1997 (Stephens, 2003) and the latter has been considering closure owing to significant illegal catch (Gordon and Cook, 2004). With the large market demand for abalones, abalone aquaculture has been reported in many places such as Australia, China, Japan, South Africa, Taiwan, and the USA (Olin, 1994; Fleming and Hone, 1996; McBride, 1998; Freeman, 2001; Godfrey, 2003; Stephens, 2003). However some countries exporting dried abalones, like the Philippines, rely heavily on wild-caught abalones for re-stocking (Tahil and Juinio-Menez, 1999). On the other hand, some countries are actively exploring the potential to compete for a share (or a bigger share) of the abalone aquaculture markets (Fleming, 2003; Iitembu, 2005).

Traditionally, East Asians have placed emphasis on the consumption of fishery resources as a health tonic (Vincent, 1996), a factor that has played a key role in influencing global demand for such food items (Clarke, 2002). Apart from fresh seafood, dried seafood is also very popular in Asian markets (Clarke, 2002). As an important trade and economic centre in the region, Hong



Ji Pin Bao - Dried Abalone Imported from Japan - on Sale in a Hong Kong Dried Seafood Shop at USD641/kg (Left) and USD534/kg (Right).

Kong has played a key role in the international trade of many dried seafood products, including abalones, shark fins, fishes, fish maws (dried fish bladders), seahorses and beche-de-mer (sea cucumber) as importer and re-exporter (Clarke, 2004). Hong Kong has dominated the world trade in abalones, especially dried abalones, for many years. The annual total of imports in the 1990s (Clarke, 2004) was consistently more than 25% of the annual total world supply (Gordon and Cook, 2004). The current study aimed to update knowledge of the import and re-export statistics of dried abalones in Hong Kong subsequent to the work done by Clarke (2004). In addition, since no species identification investigation was undertaken by Clarke (2004), this study attempted to determine which species are involved in the dried abalone trade in Hong Kong.

BACKGROUND

Abalone is commonly called *bao yu* in modern Chinese. It has long been regarded as one of the most esteemed delicacies in Chinese history, referred to as *fu yu* or *shi jue ming* in ancient Chinese (Zhu, 2004). The earliest historical record of the consumption of abalones in China is found in one of the Chinese classic texts *Zhou Li*, or the *Rituals of Zhou*.¹

In the *Tian Gong* chapter of *Zhou Li*, which recorded the medical and food histories of the Zhou Dynasty (1122 to 256 BC), abalone was recorded as a regular ingredient of the emperor's diet (Zhu, 2004). In another Chinese classic text - *Hanshu* or the *Book of Han* (Wang Mang chapter), which recorded the history of the Western Han Dynasty (260 BC to 9 AD) - Emperor Wang Mang of Xin Dynasty (8 to 23 AD) was recorded as being very fond of eating abalone. Historical records of the use of abalone in cooking can also be found in Sui, Tang and the Five Dynasties (581 to 923 AD) and Qing Dynasty (1616 to 1911 AD) (Wang, 1991; Wang, 1998; Yuan, 1997).

Dried abalone has always been an expensive food in Chinese culture. For example, it was one of the "eight marine precious delicacies" in the Qing Dynasty (1616 to 1911 AD) which was consumed only by the Emperor, and senior officials (Yuan, 1997). Today, dried abalone heads the list of the "four marine precious delicacies", which includes sea cucumber, shark fin and fish maw (Zhu, 2004). Dried abalone is also regarded by traditional Chinese medicine practitioners as having a range of medicinal values including providing nourishment to the lungs and liver and heat relief, and is particularly good for improving women's health (Zhu, 2004). However, nutritionists suggest that the nutritional value of abalone is not unique (Zhu, 2004). Consumption of dried abalone is therefore more likely an implicit reflection of wealth and social status as inherited from traditional Chinese culture rather than for its nutritional or medicinal values (Zhu, 2004). This also explains why fresh abalones, which should have similar nutritional or

THE SURVEY AREA:
DES VOEUX ROAD WEST,
HONG KONG ISLAND.

OVER EIGHTY SHOPS
SELLING VARIOUS
TYPES OF DRIED
SEAFOOD PRODUCTS
CAN BE FOUND IN THIS
LOCALITY.



medicinal value as dried abalones, are less expensive (and therefore less popular) in Hong Kong (between USD17 to 100 per kg) in comparison with dried abalones (USD300 or above per kg).

Nowadays, dried abalone is a common delicacy amongst the wealthy and at banquets. Based on cross-border trade data compiled by the Census and Statistics Department of Hong Kong, major exporters of dried abalones to Hong Kong are Australia, Japan, Oman, Singapore, South Africa and the United Arab Emirates. However the dried abalones that are most highly valued in Hong Kong's market are those coming from Japan, named as *wo ma bao* and *kat pun* (Clarke, 2002). Dried abalones in trade in Hong Kong (and China) are identified by brands rather than species, and each brand might be made up of a few species which are grouped together according to size and quality (Clarke, 2002). The demand for seafood in China has been increasing following the economic growth in the country in the 1990s (Fleming, 2003). It has been suggested that Australian exports of abalones to China will grow considerably in future (Fleming, 2003).

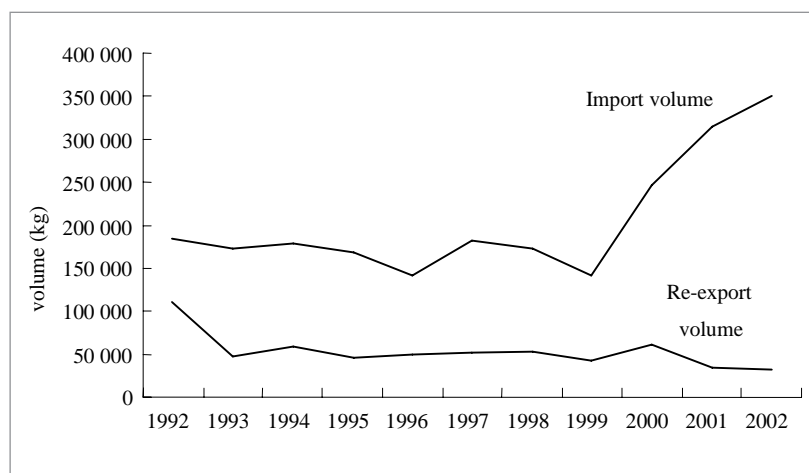


Figure 1. Imports and exports of dried abalones, Hong Kong, 1992 to 2002.

Source: Database supported by the Census and Statistics Department, Hong Kong.

¹Zhou Li was most likely written between 403 and 256 BC to record the ritual procedures of the Zhou Dynasty (Anon., 2006).



METHODS

Hong Kong trade statistics

Research for this paper involved study of the trade statistics for dried abalones kept by the Hong Kong SAR Government's Census and Statistics Department (CSD) from January 1992 to June 2003. Hong Kong does not produce abalones and the trade data referring to domestic exports are re-exports of stockpiled dried abalones and are referred to in this report as re-exports.

Global trade statistics

Global trade statistics were retrieved online from Fisheries Global Information System (FIGIS) (FAO, 2003) and compared with trade statistics in Hong Kong for the study period.

Market investigation in Hong Kong

A market survey was conducted from October 2003 to early January 2004 in order to collect information on brands, origins, popularity, size ranges and price ranges of dried abalones in Hong Kong. This survey period coincided with the beginning of the Lunar New Year, during which consumption of dried abalones would increase; demand for this mollusc just prior to this period, therefore, is probably at its highest in the year. Discussions with traders, however, suggest that the species' composition remains constant throughout the year.

The survey was conducted along Des Voeux Road West on Hong Kong Island, where over 80 shops selling various types of dried seafood products are located. Dried seafood shops with a reasonable quantity of dried abalones on display were selected haphazardly along the main road and alleys in this locality. Face-to-face interviews were conducted with shop traders. The sizes of different brands of dried abalones were estimated, or measured using a ruler whenever possible, and traders'

Country	% Contribution
South Africa	19
Australia	16
Indonesia	15
Japan	11
Mozambique	11
Philippines	9
Oman	7
Others (9 in total)	12
Total	100

Table 1. The countries of origin of preserved abalones imported into Hong Kong between 1998 and 2002.

Source: Database supported by the Census and Statistics Department, Hong Kong.

Country	% Contribution
USA	54
Canada	26
Singapore	13
Taiwan	2
China	2
Malaysia	2
Others (13 in total)	1
Total	100

Table 2. The re-export countries of preserved abalones from Hong Kong between 1998 and 2002.

Source: Database supported by the Census and Statistics Department, Hong Kong.

comments on the change in size of different species of dried abalones upon soaking were recorded. Literature records of the fresh and dried sizes of different abalone species were also collected. These records enabled the authors to determine a conversion factor for the change in size from fresh to dried abalone and thus assist in the identification of species of dried abalones traded in Hong Kong.

RESULTS

Hong Kong trade statistics

Abalones imported into Hong Kong are placed under the categories "dried, salted or in brine", "live, fresh or chilled" and "frozen". Imports of abalones "dried, salted or in brine" (which may include dried and canned abalones and are collectively known as "preserved abalones"), amounted to around 150 000 kg in most years in the 1990s (Figure 1). However, there was a sharp increase from 1999 onwards, and in 2002 the amount imported was more than double the quantity imported in 1999. During the first six months of 2003, more than 138 000 kg of abalones in this category were imported into Hong Kong. Import figures for 1999 to 2003 for abalones "dried, salted or in brine" constituted 14% of all abalone imports. The re-export quantity was stable during this period.

From 1998 to 2002, the leading exporters of preserved abalones by country of origin were South Africa, Australia and Indonesia (Table 1). Each of them consti-



A PART FROM DRIED ABALONE, DRIED CROWN CONCH *HEMIFUSUS* IS ANOTHER DRIED MARINE GASTROPOD PRODUCT THAT IS AVAILABLE IN THE HONG KONG MARKET: MUCH CHEAPER THAN DRIED ABALONE IT IS ALSO LESS COMMONLY AVAILABLE. THESE DRIED CROWN CONCH SLICES (RIGHT) ARE ABOUT USD32/KG (EACH SLICE IS AROUND 10 CM IN DIAMETER). ACCORDING TO THE LABEL, THEY WERE IMPORTED FROM SENEGAL. THE MUSCULAR FEET OF DRIED CROWN CONCH ARE ALSO FOUND IN TRADE (MAIN PICTURE). THESE WERE PRICED AT USD60/KG IN A SHOP IN THE WESTERN DISTRICT OF HONG KONG. ACCORDING TO THE SHOPKEEPER, THEY WERE IMPORTED FROM TSINGTAO, CHINA.



PHOTOGRAPHS: ALLEN TO

tuted at least 15% of local preserved abalones imported under the commodity category “abalone, dried, salted or in brine”. During the same period, the USA was the leading importer of preserved abalones from Hong Kong, contributing to over 50% of the total re-exports (Table 2).

Comparing the Hong Kong import and re-export data between 1998 and 2002, Hong Kong was believed to have consumed 82% of the imported preserved

Quantity	1998	1999	2000	2001	2002
Import	172	142	246	314	351
Re-export	52	42	60	34	31
Estimated consumption in Hong Kong	120	100	186	280	320
Percentage	70	70	75	89	91

Table 3. Estimated consumption of preserved abalones (1000 kg) in Hong Kong by quantity from 1998 to 2002.

Source: Database supported by the Census and Statistics Department, Hong Kong.

abalones in this five-year period (Table 3). However, it should be noted that data concerning stockpiling of preserved abalones are not available (see the results of the market investigation below).

Global trade statistics

The global trade statistics held by FAO do not have a category for dried abalone. The FAO category “mollusks nei (not elsewhere included), dried, salted, pickled, etc.” was thus used as this was the most relevant category for dried abalone. The only other dried molluscs seen during the market survey were crown conchs (*Hemifusus* spp.). There appear to be four edible species of crown conchs (*H. ternatanus*, *H. crassicaudus*, *H. tuba* and *H. colosseus*) which are distributed in South-east Asia and Japan (You *et al.*, 2000; Chen, 2005). Very little information is available from the literature about the trade, however, it is apparent from any visits to dried seafood shops in Hong Kong that the volume of trade in dried crown conchs is far less significant than in dried abalones. Thus, it can be assumed that the imports to

Import quantity (t)	1997	1998	1999	2000	2001
FAO - Hong Kong “molluscs nei, dried, salted, pickled, etc.”	5071	4959	4140	4605	4180
FAO - global “molluscs nei, dried, salted, pickled, etc.”	12 652	8568	8545	8405	10 470
Percentage of Hong Kong to global import quantity	40	58	48	55	40

Table 4. The percentage of Hong Kong to global import quantity (1000 kg) of dried abalones from 1997 to 2001.

Source: Fisheries Global Information System (FIGIS) supported by FAO.

Re-export quantity (t)	1997	1998	1999	2000	2001
FAO - Hong Kong “molluscs nei, dried, salted, pickled, etc.”	1256	993	915	1135	942
FAO - Global “molluscs nei, dried, salted, pickled, etc.”	1256	999	915	1145	942
Percentage of Hong Kong to global re-export quantity	100	99	100	99	100

Table 5. The percentage of Hong Kong to global re-export quantity (1000 kg) of dried abalones from 1997 to 2001.

Source: Fisheries Global Information System (FIGIS) supported by FAO.

Brands	Dried size ranges (cm)	Price ranges (USD/kg)	Suggested origins	Possible species
Wo ma bao	4-8	427-1923	Japan	<i>Haliotis discus discus</i> , <i>H. discus hannai</i>
Ji pin bao	5-7	534-1816	Japan	<i>Haliotis discus discus</i> , <i>H. discus hannai</i>
Da wang bao	7-14	342-855	South Africa	<i>Haliotis midae</i>
Zhong dong bao	7-14	402-833	Middle East	mainly <i>Haliotis marie</i>
Fei zhou bao	10-14	363-1239	Africa other than South Africa	insufficient data

Table 6. The different brands of dried abalones traded in Hong Kong. Size refers to head to tail length of the dried abalone.

- TAXONOMY:** Abalones are from the class Gastropoda (snails, whelks and sea slugs) in phylum Mollusca (Middlebrook, 1999). About 70 abalone species have been described and all are placed in the family Haliotidae (which means sea ear) and in the genus *Haliotis* (Lindberg, 1992; Zhu, 2004).
- MORPHOLOGY:** The shell bears a row of holes which function as respiratory channels and for discharging wastes, and they bear muscular feet which help them to attach firmly to the substrates (Huang, 1998; Middlebrook, 1999; Fishtech, 2004). Morphological features such as number of holes, colour and shape of the shell and the characteristics on the epipodium (the prominent fold or border on the shell) are useful in identifying abalone species (Anderson, 2003). The largest known species is the Red Abalone *Haliotis rufescens*, which can attain a shell length of 31 cm (Middlebrook, 1999).
- ECOLOGY:** Abalones live on rocky shores (Anderson, 2003). They have rasp-like teeth to graze algae and planktons on substrate surfaces (Huang, 1998; Middlebrook, 1999). Their predators include sea otters, rock crabs, octopuses, fishes and starfish (Middlebrook, 1999; Smith *et al.*, 2003). A large proportion of the world's abalone species can be found in the Pacific (Lindberg, 1992; Huang, 1998; Zhu 2004). Abalones are dioecious (separate sexes) and they spawn externally, often in a synchronized manner within the whole population (broadcast spawning) (McShane, 1992; Middlebrook, 1999). The larvae - veligers - undergo a period of free-swimming and then settle and grow into a miniature abalone (McShane, 1992; Middlebrook, 1999). In general, abalones are relatively slow-growing among gastropods and may need a few years before reaching sexual maturity (Zhu, 2004); some species can live for over 70 years (Smith *et al.*, 2003). Though they are fecund spawners (some species can produce millions of eggs) (McShane, 1992; Middlebrook, 1999), mortality of new-born can be as high as 99% (Fishtech, 2004).
- USE:** Abalone flesh is considered a delicacy especially in Asia (Zhu, 2004). It is sold fresh, frozen, canned and dried (Huang, 1998; Zhu, 2004). Native Americans use whole abalone shell as bowls, pieces of the shells as fish-hooks, and even as necklaces and jewellery (Anderson, 2003). Abalone shell is also used as medicine (Huang, 1998). Of the 70 species of abalones, only around 20 species have populations that are able to sustain large-scale abalone fisheries (Fishtech, 2001; Zhu, 2004). Major harvesting countries include Australia, South Africa and Japan (Fishtech, 2004). Wild abalones are collected by snorkellers or SCUBA divers using a spatula or screwdriver (Jenkins, 2004).
- AQUACULTURE:** Several species of abalone are known to be cultured. These include *H. rufescens*, *H. discus hannai*, *H. asinine*, *H. midae*, and *H. rubra* (Fishtech, 2004; Anderson, 2003). Major abalone-culturing countries include the USA, Japan and China (Fishtech, 2004). Statistics from FAO suggest that nearly all abalone exports from Taiwan are derived from aquaculture. Methods of abalone aquaculture vary from inland culture, tidal culture, long-line culture, cage-net culture to seed-planting (Huang, 1998; Fishtech, 2004). Available information suggests that most abalone seeds for aquaculture are supplied from hatchery production (Huang, 1998; Fishtech, 2004). As in Taiwan, over 90% of all abalone seeds for aquaculture are hatchery-produced (Huang, 1998; Fishtech, 2004).
- THREATS & CONSERVATION:** Wild stocks of abalones worldwide have been declining in the recent past (Guzmán del Prío, 1992; Middlebrook, 1999). Black Abalone *H. cracherodii* is listed as Critically Endangered by the IUCN Red List of Threatened Species (IUCN, 2004). The major reason for its decline is over-harvesting, both legal and illegal. Restocking of some species such as the White Abalone *Haliotis sorenseni*, listed as Endangered under the US *Endangered Species Act*, is being carried out to raise the wild stock to a safe level (Anderson, 2003; NOAA, 2006). The dragging of abalone-collecting bags by fishermen and boat-anchoring by fishermen are also potential threats to the ecosystem, especially to fragile coral communities (Jenkins, 2004).
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FRESH ABALONE ON SALE AT SHEUNG SHUI MARKET, THE NEW TERRITORIES, HONG KONG.

Hong Kong of “mollusks nei, dried, salted, pickled, etc.” in the FAO statistics are mostly dried abalones. This is probably also the case in the global trade under the same category. The FAO statistics show that Hong Kong contributed to an annual average of about 48% by quantity of global imports of dried abalones from 1997 to 2001 (Table 4). Hong Kong appeared to be the sole re-exporter of dried abalones in the world (Table 5).

Market investigation in Hong Kong

A total of 42 shops selling dried seafood, including dried abalones, were surveyed. Almost all of these shops were also selling other dried seafood products such as fish, fish maws, shrimps and shark fins. Of these 42 shops, 39 were retailers and three were wholesalers. Since wholesalers and retailers in Hong Kong import products directly from the source countries (Clarke, 2002), information regarding sources of the products collected from retailers and wholesalers should not differ greatly.

An informal counting along Des Voeux Road West suggested that more than 56 dried seafood shops (over 70%) which did not specialize in only one product (usually shark fin) had significant quantities of dried abalones on sale. Five brands of dried abalones were commonly found and all shop staff unanimously stated the same country of origin for these brands (Table 6). Other brands such as *tang xin bao* were on sale in a few shops and names differed slightly from shop to shop; the countries of origin for these brands were unclear.

Both *wo ma bao* and *ji pin bao* (Table 6) originate from Japan. The two main abalone species harvested in Japan are *H. discus discus* and *H. discus hannai* (Arata Izawa, Fisheries Officer, TRAFFIC East Asia-Japan, pers. comm., to A.W.L. To, 1 March 2004). The maximum size available for *H. discus discus* and *H. discus hannai* is about 14 cm (Huang, 1998). According to the traders interviewed, the average reduction in size of fresh to dried abalone is around 45%. Thus the dried size of these two species is similar to the size of *wo ma bao* and *ji pin bao* found in Hong Kong's shops. It is likely that these two abalone species are grouped into *wo ma bao* and *ji pin bao* according to the quality of specimens after the manufacturing process. Oakes and Ponte (1996) state

that the most prized abalone in Japan is *H. discus hannai*.

Da wang bao from South Africa (Table 6) is likely to be *H. midae* since this is the only abalone species in South Africa that is commercially exploited (Hauck and Sweijd, 1999; Godfrey, 2003). The documented maximum size of fresh *H. midae* is 20 cm (Sales and Britz, 2001). Assuming the same reduction factor of 45% after drying, the dried size of *H. midae* is also within the range of *da wang bao* in Hong Kong shops.

All *zhong dong bao* - which literally means the Middle East abalone - were reported to come from the Middle East. Abalone import statistics from Hong Kong include only two Middle East countries, namely Oman and the United Arab Emirates (UAE). Oman has been exporting a large quantity of dried abalones since 1992, averaging 17 000 kg per annum from 1998 to 2002, but the quantity imported by Hong Kong from the UAE has been declining, especially in recent years, with only 30 kg in the first six months of 2003. Nevertheless, the only species of abalone in Oman is *H. mariae* (Feidi, 2002) while the species harvested in UAE is also likely to be *H. mariae* (Robert Day, pers. comm. to A.W.L. To, 10 March, 2004). The largest documented size of *H. mariae* is 15.25 cm (Siddeek and Johnson, 1997). A 45% reduction in size will give a dried size of 6.9 cm, which is just outside the size range of the *zhong dong bao* measured in Hong Kong markets. Bearing in mind that the 45% reduction factor is a mean figure, the authors still believe that the majority of the *zhong dong bao* on sale in Hong Kong is *H. mariae* from Oman.

Lastly, *fei zhou bao* - which literally means African abalone - was reported by traders to have come from African countries other than South Africa (Table 6). There seems a clear market differentiation from the *da wang bao* from South Africa. The Hong Kong trade statistics show that, apart from South Africa, dried abalones were imported from the following African countries: Madagascar, Mauritius, Mozambique, Namibia, Senegal, Swaziland, Zambia and Zimbabwe, but only Mozambique was exporting a substantial quantity of dried abalones to Hong Kong between 1998 and 2002 (Table 1). Little information is available from the literature concerning an abalone fishery in Mozambique. Since Mozambique is adjacent to South Africa on the east coast of Africa, the species traded to Hong Kong may well be *H. midae* imported to Mozambique from South Africa. Regulations governing the export of abalones from South Africa have become stricter in the past few years in order to minimize illegal catch, and it is therefore possible that dried abalones imported from Mozambique to Hong Kong might actually be *H. midae* from South Africa. The most probable abalone species for *fei zhou bao* is thus believed to be *H. midae*.

The most popular (and also the most expensive) dried abalone brand was suggested by 34% of surveyed shops (n=13) to be *wo ma bao*, followed by *ji pin bao* (18% of shops (n=7)). About 74% of traders (n=31) reported that all dried abalones were wild-caught, only 17% (n=7) reported cultured abalones and the percentage of cultured abalones in the trade was reported to be between 10-70%. In addition, all traders believed that the sale of

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HALIOTIS DISCUS HANNAI
(FRESH, CULTURED SPECIMENS, LEFT) IS REPORTED TO BE THE MOST PRIZED ABALONE IN JAPAN. IN ITS DRIED STATE IT IS LIKELY TO BE ONE OF TWO ABALONE SPECIES GROUPED, ACCORDING TO QUALITY, INTO THE BRANDS WO MA BAO AND JI PIN BAO.

ALLEN TO



WO MA BAO FROM JAPAN ON SALE IN A HONG KONG DRIED SEAFOOD SHOP AT USD791/KG. THIS BRAND WAS REPORTED TO BE THE MOST POPULAR (AND MOST EXPENSIVE) DRIED ABALONE AVAILABLE IN HONG KONG.

ALLEN TO



CANNED ABALONES SEEN DURING THE SURVEY CAME MAINLY FROM AUSTRALIA (LEFT) AND MEXICO.

cultured and wild-caught dried abalones would not differ because buyers would be unable to tell them apart.

During the interviews, one experienced local trader who has been in the business for decades pointed out that the popularity of dried abalones used to be influenced by the dryness (and thus quality) of the abalone and price. The drier the abalone, the longer it can be preserved. However, after the Asian economic crisis of the late 1990s, price has become the dominant factor in recent years. In fact, over a quarter of respondents (n=11) replied that none of the dried abalone brands was particularly popular and that the popularity of different brands would change with time.

Table 3 implies that an increasing quantity of imported dried abalones was consumed locally from 1998 to 2002 which was unlikely to be due to the eco-

nomical downturn after the Asian economic crisis in this period. One of the traders interviewed pointed out that traders would import a larger quantity of dried abalones during times when import prices were low. This may explain why there was an increase in importation during and after the Asian economic crisis. However, this trader pointed out that there was no consensus on the quantity of stockpiled dried abalones as there is no requirement to declare or report statistics to government authorities. Some companies, however, would keep on stockpiling until reaching a certain quantity that would influence the market price. Unfortunately, this trader was unable to tell the authors the approximate quantity of dried abalones that was normally stockpiled in Hong Kong. Nevertheless, the estimated local consumption of dried abalones (Table 3) is likely to be an overestimate.

Abalones are also canned and frozen and are available in the dried seafood shops as well as supermarkets. Four local traders indicated that dried abalones, which require days of soaking and hours of cooking, had been losing market popularity. Instead, customers had begun to buy canned abalones which were priced at USD23-29 per can. Canned abalones seen during the market survey were produced mainly in Australia and Mexico, although Hong Kong import data indicate that both Australia and the Philippines have been the two largest exporting countries of frozen abalones to Hong Kong since 1992. However, it is unlikely that canned or frozen abalones will totally replace dried abalones, which can be stored for years without the quality of the product deteriorating and are more popular in Chinese restaurants and much more expensive than canned abalone. In addition, the procedure for drying abalones is very different to that which is employed for canning and freezing abalones.

Country	% Contribution
Philippines	30
Australia	23
South Africa	14
Malaysia	8
Mozambique	5
New Zealand	5
Swaziland	4
Others (26 in total)	11
Total	100

Table 7. The countries of origin of frozen abalones imported into Hong Kong between 1998 and 2002.

Country	% Contribution
China	90
Canada	4
Macau	2
Malaysia	1
Singapore	1
South Korea	1
Others (7 in total)	1
Total	100

Table 8. The destination of re-exported frozen abalones from Hong Kong between 1998 and 2002.

Sources: Database supported by the Census and Statistics Department, Hong Kong.

DISCUSSION AND CONCLUSIONS

There is a major discrepancy between Hong Kong's trade statistics and the countries of origin of the different brands of dried abalones commonly available in Hong Kong, as reported by the traders. The three principal exporters - Australia, Indonesia and the Philippines, as reported in the trade statistics - are not producing any of the five dried abalone brands available in Hong Kong. This may be attributable to the fact that the trade category in Hong Kong "abalone, dried, salted or in brine" has included most or all of the abalones exported to Hong Kong from Australia which are kept in brine in cans. However, no direct evidence can account for the absence of abalone from Indonesia and the Philippines from the common dried abalone brands in Hong Kong. One possible explanation is that large quantities of abalone products coming from these two places may be in "canned" form, which is likely to be grouped into local commodity code "abalone, dried, salted or in brine", and therefore unrecorded during the market survey on dried abalones (which excluded canned abalones). Despite the complicated issue of the commodity categories concerning abalones in the global trade statistics of the FAO, it is clear from these figures that during 1997 to 2001, Hong Kong was still playing the dominant role in the re-export of dried abalones (see Table 5). On the other hand, it is estimated to have been involved in 48% of the global import market.

An important implication from the increasing quantity of dried abalones being imported into Hong Kong is that relatively few countries are involved in supplying abalones to Hong Kong, principally South Africa, Australia and Indonesia. While these countries have not been supplying cultured abalones in any large quantities in comparison with China and Taiwan (Gordon and Cook, 2004), the fishing pressure on the wild stock should have been increasing in these countries. In fact, over-fishing of abalones has been reported in South Africa and Australia (Hauck and Sweijd, 1999; Fleming, 2003; Godfrey, 2003). The trade statistics also show that quantities of dried abalones from the Philippines have been decreasing in recent years, which may be a sign of decreasing abalone stock.

The decline in quantities of dried abalones re-exported to China from 1998 to 2002 may be a result of the increased openness of China and more mainland traders import their own dried abalones directly from the supplier countries without trading through Hong Kong. On the other hand, the significant increase in aquaculture production of abalones in China (4500 t or more than 50% of the world total aquaculture production in 2002) in recent years may also be a reason (Gordon and Cook, 2004). In view of the rapid economic growth in China and the huge population, consumption of abalones will likely increase rather significantly. Future trade studies on abalones should include China separately.

The market investigation revealed that only four abalone species were commonly traded in Hong Kong under five different brands. In recent years, South Africa



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BILLY HAU

has had the largest abalone fishery and has been exploiting solely *H. midae* for commercial purposes. Concern that this species will be commercially extinct in a few years is unsurprising given the current pressure on the fishery (Itano, 2003). The aquaculture of this species in South Africa may be a way to lessen commercial exploitation on the wild stock (Gerber Werner pers. comm. to A.W.L. To, January 2004; Godfrey, 2003), if production was sufficiently high. Based on the results of the market survey, consumers are unable to tell cultured and wild-caught abalones apart, and therefore consumer preference for wild-caught abalones is unlikely. More effective enforcement to reduce illegal poaching would help greatly, particularly during the early stages of aquaculture production and until sufficient stocks of cultured abalones are available.

Dried abalone, which is still popular especially among restaurateurs, will almost certainly be consumed less by most local consumers than canned or frozen abalones which are comparatively easier to prepare at home. It could thus be expected that the increase (or decrease) in quantity of "dried abalone, salted or in brine" in Hong Kong will likely be due to the changes in demand and consumption for canned abalones. This further highlights the need to sub-divide this category in the trade statistics in Hong Kong and FAO.



DRIED ABALONE

ALLEN TO

RECOMMENDATIONS

- The Hong Kong commodity category applicable to dried abalone is currently “abalone, dried, salted or in brine”. In order to assess clearly the increasing importance of canned abalones imported into Hong Kong (see Fleming, 2003), this category should be divided into “abalone, dried or salted” and “abalone in brine” to enable more accurate assessment of the trade in dried abalones.
- The FAO commodity categories form a very comprehensive system of global fisheries statistics. However, the categorization of the same products in different countries might result in different coding in FAO fisheries data. This will obviously make it difficult to estimate the global trade of these products. It is therefore suggested that an international coding system be set up for all fisheries products.
- With the increasing importance of China in abalone consumption and aquaculture production, as well as the increasing openness of the Chinese markets in international trade, direct importation of dried abalones into China will be more and more significant. The role of Hong Kong as the dominant regional and global importer and re-exporter of dried abalones may become less significant. Future trade studies on dried abalones (in fact on all dried seafood items) should cover China.
- A discrepancy between local “abalone, dried, salted or in brine” import quantity (by weight) and results from local dried abalone markets was identified. Relatively large quantities (by weight) of preserved abalones imported from Indonesia and the Philippines are, however, totally missing in the local dried abalone market. The form of abalone products imported from these two countries needs to be investigated further.

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Postscript: South Africa informed the 22nd meeting of the Animals Committee (held in Lima, Peru, 7 to 13 July 2006) during plenary of its intention to list the country's endemic abalone species *Haliotis midae* in Appendix III, noting as justification its illegal harvesting and trade. South Africa noted that national measures to control the trade are in place but additional measures were required. The Ministry of Environmental Affairs and Tourism has approved the listing and a consultation process has been conducted, including with fishing rights holders and the mariculture industry. Major importing countries were requested to assist South Africa in the implementation of the listing.



TRAFFIC BULLETIN SEIZURES AND PROSECUTIONS IS SPONSORED BY THE FORESTRY BUREAU, COUNCIL OF AGRICULTURE, TAIWAN: COMMITTED TO SUPPORTING CITES ENFORCEMENT

The cases reported below represent a selection of recent seizures and prosecutions that have taken place around the world. The sources of this information are cited at the end of each country section. The CITES Appendix-listing for each species is placed in parentheses, where appropriate.

EUROPE

BELGIUM

On 10 April 2006, at Zaventem Airport, Brussels, Customs officials seized 21 Senegal Galagos *Galago senegalensis* (CITES II) upon arrival from Conakry, Guinea, bound for the Czech Republic. Three animals perished. The CITES documents and health certificates were not correct.

Belgian Customs Airport News, CITES 08/2006

CROATIA

On 19 February 2006, Customs officers on the Croatian-Serbian border at Bajakovo confiscated 22 live specimens of Spur-thighed Tortoises *Testudo graeca* and Hermann's Tortoises *T. hermanni* (both CITES II). The reptiles had been concealed in luggage space on a bus travelling from Macedonia en route to Germany. The bus driver was fined a total of €2340 (USD3000) under the *Customs Law, Nature Protection Law* and the *Penal Code*. The tortoises are being held in a rescue centre prior to repatriation.

Katica Bezuh, Head of Department for Inspection and Legal Affairs, Ministry of Culture, Nature Protection Directorate, Zagreb

FRANCE

On 13 December 2005, Customs officials at Roissy Airport seized worked elephant ivory pieces weighing a total of 60 kg arriving from Abidjan, Côte d'Ivoire, en route to New York. The pieces were disguised to resemble wooden items and the accompanying export permit related to wooden items. Closer inspection showed that the pieces had been covered by adhesive tape and coated with clay and sand to resemble wood. A total of 12 tusks and 43 figurines in worked ivory were unwrapped.

On 19 November 2005, Customs officials at the airport seized 22 elephant ivory items arriving from Nigeria, bound for the UK.

French Custom - Direction Générale des Douanes et des Droits Indirects

GERMANY

In March 2006, Victor Franck, widely referred to as one of Germany's most wanted animal



TAXIDERMY SPECIMENS ILLEGALLY PURCHASED IN THE UK VIA THE INTERNET INCLUDED LONG-EARED OWL *ASIO OTUS*.

WWF-CANON / CHRIS MARTIN BAHR

smugglers, was detained in Malaga, Spain. Franck had been found guilty of wildlife trade offences and sentenced to three years' imprisonment without probation in January 2001 - one of the longest sentences ever imposed in Germany for a wildlife trade violation (see *TRAFFIC Bulletin* 19(1):45). Directly after his conviction, however, Franck disappeared. An international warrant for his arrest was issued but it was to be five years before the authorities caught up with him. A decision on whether to extradite Franck to Germany, as requested by the German authorities, is awaited.

Four Germans and one Russian were initially charged in 2001 with comprising a criminal organization under Section Paragraph 129 under the Criminal Code of German law and accused of 41 cases of smuggling or attempting to smuggle a range of species which included CITES I-listed Orang-utan *Pongo pygmaeus*, Javan Gibbon *Hylobates moloch*, Komodo Monitor Lizard *Varanus komodoensis*, Red-crowned Crane *Grus japonensis* and Arabian Oryx *Oryx leucoryx*. The other defendants were released after being held in custody for between a few days and eight months. Two were fined.

TRAFFIC Europe; TRAFFIC Bulletin 19(1):45

HUNGARY

On 12 April 2006, at Ferihegy International Airport, Budapest, a Slovakian citizen was arrested after being found in possession of 36 live Spiny-tailed Lizards *Uromastyx ornatus* and *U. aegyptia* (CITES II, EU Annex B) and 18 Egyptian Tortoises *Testudo kleinmannii* (CITES I, EU Annex A) from Egypt. They had been concealed in boxes containing spices and tea; some of the lizards were in a very poor condition. The offender was released following interrogation and an investigation is in progress.

Hungarian CITES Management Authority

UK

On 2 December 2005, at Swaffham (Central Norfolk) Magistrates' Court, Mark Rowland of Hilborough was sentenced to eight months in custody, suspended for two years, for illegally purchasing via the internet and keeping for sale CITES-listed taxidermy specimens. He was also given a 200-hour community order, all seized specimens were forfeited and he was ordered to pay GBP225 (USD416) costs. The transactions, which took place within the UK, involved Buzzard *Buteo buteo* (CITES II), Kestrel *Falco tinnunculus* (II), Barn Owl *Tyto alba* (II/WCA Sch. 1), Long-eared Owl *Asio otus* (II), Tawny Owl *Strix aluco* (II) and Sparrowhawk *Accipiter nisus* (II/EU Annex A). Rowland was also involved in the importation of American Black Bear *Ursus americanus* (II) from Canada.

In December 2005, Customs officers from the CITES Team at Heathrow Airport seized 12 live Ring-tailed Lemurs *Lemur catta* (CITES I) in transit from Canada to China. In line with CITES recommendations the microchip details were obtained from the specimens and were found not to correspond to the accompanying CITES permit. Following investigations undertaken in Canada the specimens were seized.

In February 2006, Customs officers from the CITES Team seized 240 live Spectacled Caimans *Caiman crocodylus* (III) in transit from Guyana to Russia. The accompanying CITES export permit was invalid.

In January 2006, at Stansted Airport, Customs officers seized 102 live seahorses imported from the USA in an Air Express courier parcel. No CITES documents accompanied the shipment.

On 17 January 2006, at Isleworth Crown Court, Dr Sian Tiong Lim from London pleaded guilty to 11 charges of illegally importing orchids into Britain from his native Malaysia. He was sentenced to four months in gaol.

Dr Lim was detained at Heathrow Airport in May 2004. Officers from the Customs CITES Team and specialists from the Royal Botanic Gardens, Kew, examined Dr Lim's baggage and found 126 CITES I-listed orchids (without permits) including Asian slipper orchids *Paphiopedilum rothschildianum*, *P. gigantifolium* and *P. sanderianum*, and a large quantity of CITES II-listed orchids.

Paphiopedilum gigantifolium is thought to be extinct in its original locality due to overcollecting, and *P. rothschildianum* is one of the rarest *Paphiopedilum* species in nature. *Paphiopedilum sanderianum* - easily recognizable by its long drooping petals which can grow to a length of more than a metre - is only known from a single national park in Borneo. As many slipper orchid species grow in small populations with a limited distribution, their survival in the wild can be seriously affected by the removal of only a small number of individuals.

HM Revenue & Customs CITES Team, Heathrow Airport; Cuttings (Botanic Gardens Conservation International Quarterly Newsletter) 3(2) April 2006; www.sun2surf.com/article.cfm?id=12680, 18 January 2006; Nicholas Crampton, Crime Prosecution Service, Norfolk.

AFRICA

KENYA

In three separate raids in April 2006, rangers of the Kenya Wildlife Service (KWS) recovered more than 160 kg of elephant tusks and processed ivory, two rhino horns, as well as other illegal wildlife trophies and large quantities of illegal bushmeat. A total of 14 people, including six Italians, were arrested and charged with illegal hunting and possession of trophies without a licence. The raids were carried out following information received from members of the public. The suspects have all pleaded not guilty. KWS deputy chief Peter Leitoro said the agency had stepped up surveillance on illegal poaching, which is reported to have risen in recent months.

In March, the government blamed increasing incidents of poaching and illegal trade in bushmeat in the country on a drought that has put millions of people across East Africa at risk of famine.

Mail and Guardian (South Africa), 7 April 2006: www.mg.co.za/articlepage.aspx?area=breaking_news/breaking_news_afical&articleid=268838

SOUTH AFRICA

On 30 March 2006, three foreign nationals were arrested by CapeNature staff at Vrolijkheid Nature Reserve outside Robertson, Western Cape, after being found in illegal possession of spiders and scorpions. Richard Gallon and Guy Tansley of the UK, and Thomas Ezendam from the Netherlands, had 27 baboon spiders Theraphosidae, 20 other spiders and four scorpions. The three were found guilty by a Robertson magistrate on charges of collecting, possessing and transporting the arachnids without permits. They were each fined R10 000 (USD1611), of which R7000 was suspended.

CapeNature said Gallon was an internationally recognized spider expert, working closely with researchers in South Africa. Tansley and Ezendam were also spider enthusiasts and freelance researchers. The three claimed that while they realized what they were doing was illegal, they did not realize the seriousness of the offence.

On 25 May 2006, police acting on information arrested two men in Ocean View after finding them in possession of two bags containing 833 West Coast Rock Lobster *Jasus lalandii* tails without the requisite permits. Both men appeared in Simonstown Court later that day.

Earlier in the week, officials from the Department of Environmental Affairs and Tourism retrieved nearly 1200 poached abalones at Cape Recife, near Port Elizabeth in the Eastern Cape after Departmental officials on a road patrol noticed approximately 20 divers on the beach and in the water. Back up assistance was called for from the South African Police Service (SAPS) Abalone Task Team but before they arrived the officials were spotted and the divers fled. No arrests were made.

In a separate incident in Port Elizabeth, members of the SAPS Organized Crime and Departmental inspectors arrested one suspect for the possession of 9974 units of shucked abalone weighing more than 815 kg. A vehicle was also seized. The suspect appeared in court. He is also wanted in connection with another case involving abalone in the Cradock area.

www.iafrica.com/pls/cms/liac.page?p_t1=2&p_t2=1&p_t3=0&p_t4=0&p_dynamic=YP&p_content_id=283475&p_site_id=2 13 April 2006; Media statement, Department of Environmental Affairs and Tourism, 26 May 2006

ASIA

EAST ASIA
CHINA

A campaign to crack down on the poaching of wild Asian Elephants *Elephas maximus* (CITES I) in Yunnan Province has led to the arrest of eight people. Forest police and the forestry administration in Xishuangbanna Daizu Autonomous Prefecture jointly launched the campaign in December 2005.

Though protected as Class I animals by China's *Wild Animal Conservation Law*, the number of wild Asian Elephants is declining in Xishuangbanna and border areas of Yunnan: according to the *China Red Data Book of Endangered Animals* (Wang Sung, 1998), only 250 Asian Elephants live in the wild in Yunnan Province.

In March 2006, at the People's Court of Gerze County, in the Ngari Prefecture, two people were gaoled for 13 years for killing more than 150 Tibetan Antelopes *Pantholops hodgsonii* (CITES I and Class-A protected animal species under China's *Wildlife Protection Law 1989*) at the Qiangtang Nature Reserve during 2005. A third person was sentenced to four years in gaol.

On 23 April 2006, police in the southwestern province of Yunnan announced that 20 members of an animal smuggling ring had been arrested for their part in smuggling hundreds of bear paws and dead pangolins *Manis*. Some 278 bear paws and 416 pangolins that had been smuggled by lorry or train from Yunnan to three neighbouring provinces over a period of 45 days, from December 2005 to January 2006, were seized.

www.shanghaidaily.com/art/2006/01/19/236879/Police, 19 January 2005; Wang Sung (Ed.), (1998). China Red Data Book of Endangered Animals. Science Press. Beijing. TRAFFIC East Asia; http://news.xinhuanet.com/english/2006-03/23/content_4337692.htm, Yunnan Daily, 27 April 2006

HONG KONG

On 24 August 2005, marine police intercepted a speedboat found to be carrying 36 drums (1800 kg) of American Ginseng *Panax quinquefolius* roots. No arrests were made but all the ginseng roots were forfeited to the government pending their disposal.



On 17 January 2006, Customs officers at Kwai Chung Customhouse seized 25 cartons of turtle plastrons (the bony plate forming the ventral part of the turtle) from an incoming container. The consignment, weighing a total of 897 kg, consisted of 602 kg of Malaysian Box Turtles *Cuora amboinensis*, 260 kg of Black Marsh Turtles *Siebenrockiella crassicollis* and 35 kg of Malaysian Giant Turtles *Orlitia borneensis* (all CITES II). The plastrons were concealed under dried snakes in a container declared as dry snakes and Red-eared Sliders *Trachemys scripta elegans*. The consignment had been shipped from Indonesia to Hong Kong on 14 January, for re-export to the Mainland. No arrests have been made. The seized goods were handed over to the Agriculture, Fisheries and Conservation Department (AFCD) for further investigation.

On 22 February 2006, at Kwun Tong Magistrates' Court, a male Hong Kong resident was fined HKD15 000 (USD1923) under the *Animals and Plants (Protection of Endangered Species) Ordinance, Cap. 187* for the illegal possession of a highly endangered species.

On 9 September 2005, an AFCD officer acting on information provided by TRAFFIC, approached a suspect on the internet who was offering what was claimed to be a piece of Tiger *Panthera tigris* (CITES I) skin (6.5 cm x 6.5 cm) and a piece of Tiger skin product (4 cm x 7 cm). The officer, posing as a buyer, met the seller and seized the items from him. The specimens have been forfeited to the government in accordance with the Ordinance.

On 9 May 2006, at Kwai Chung Customhouse, Customs officers of Ports and Maritime Command carried out its largest seizure of elephant (CITES I) tusks in 20 years. While examining a 12-metre container the officers



FRENCH CUSTOM - DIRECTION GÉNÉRALE DES DOUANES ET DES DROITS INDIRECTS

IVORY CARVINGS DISGUISED AS WOOD ITEMS WERE SEIZED IN FRANCE, EN ROUTE FROM CÔTE D'IVOIRE TO THE USA

found a concealed compartment with the assistance of the Mobile X-ray Vehicle Scanning System; inside were 3.5 t of tusks.

The container originated from Douala, Cameroon, and was intended for re-export to Macau. It was declared to be carrying timber.

One man has been arrested.

Agriculture, Fisheries and Conservation Department, Hong Kong: www.customs.gov.hk/leng/new_release_20060118_turtle_plastrons_e.html, 18 January 2006; TRAFFIC East Asia; Customs and Excise Department, The Government of the Hong Kong Special Administrative Region, press release, 10 May 2006

TAIWAN

On 12 October 2005, at Taipei District Court, the manager of Breeze Center, a department store in Taipei, and the importer were each fined TWD50 000 (USD1520) for the illegal sale of whale meat cans in the shop's supermarket. Ninety-six cans had been imported from Japan. The whale meat was identified as Minke Whale *Balaenoptera acutorostrata* (CITES I/II).

On 9 March 2006, Taiwan Customs officials seized a large package of plants, including 352 *Paphiopedilum* (CITES I) specimens, that had arrived from Surabaya, Indonesia. The case is under investigation.

The plants were sent to the Taiwan Seed Improvement and Propagation Station for research purposes. The consignment is thought to comprise three *Paphiopedilum* species but confirmation of their identification will not be possible until the plants have flowered.

Over three days, Taiwanese authorities have confiscated more than 5 t of ivory at Kaohsiung Harbour - all from the same exporter.

On 6 July 2006, Kaohsiung harbour Customs officials discovered 744 pieces of African Elephant *Loxodonta africana* (CITES I) ivory (including whole tusks) (3026 kg), hidden in wooden boxes. The consignment originated in Tanzania and was routed through Singapore, where it remained in transit for a period of time. It departed for Manila, and was then re-routed to Taiwan. It resumed its journey to Manila, but returned to Taiwan without the contraband cargo being offloaded. After the cargo had remained in Kaohsiung harbour unattended for three weeks, Customs officials decided to inspect the container and discovered the ivory. Two days earlier, Kaohsiung harbour Customs officials seized 2.5 t of ivory, also from Tanzania, bound for Manila, in 18 wooden boxes. Both shipments had been sent by the same exporter, but were for two different importers in the Philippines.

"Kaohsiung Customs should be commended for their efforts as well as for the urgent follow-up measures now under way with their counterparts in Tanzania and the Philippines, as well as with Interpol" said Joyce Wu of TRAFFIC East Asia.

The ivory's routing through the Philippines, Malaysia and Singapore comes at a time when South-east Asian nations have formed the ASEAN Wildlife Enforcement Network (ASEAN-WEN) to work more closely together to confront increasingly sophisticated wildlife crime syndicates.

www.traffic.org/25/network9/ASEAN/index.html

SOUTH ASIA INDIA

On 20 December 2005, over 55 000 reptile skins were seized by the Directorate of Revenue Intelligence at the Mumbai Port, representing one of the largest-ever seizures of snakeskins. The skins had been concealed in 80 jute bags that were booked for export to Singapore and marked as 'red chillies'. At least three species of snakes were identified - Python *Python*, cobra and Rat Snake *Ptyas mucosus* (CITES II). Three people were arrested by the State Forest Department.

On 10 January 2006, police raided a house in Fatehpur, Uttar Pradesh, and seized 14 fresh Leopard *Panthera pardus* (CITES I) skins and an otter skin following information provided by the Wildlife Protection Society of India (WPSI) in collaboration with the Madhya Pradesh Forest Department. The police were trying to trace the owner of the house - an offender known to the authorities for the illegal possession on a previous occasion of Tiger *Panthera tigris* (I) and Leopard skins.

In a second case on 10 January, police in Jabalpur, Madhya Pradesh, seized a fresh, adult Tiger skin, two Leopard skins and a hyaena skin. Three persons from Dindori who had travelled to Jabalpur to sell the skins were arrested.

On 24 March 2006, at Thiruvananthapuram Airport, Kerala, the Directorate of Revenue Intelligence (DRI) seized 482 Indian Star Tortoises *Geochelone elegans* (CITES II/protected under the *Wild Life (Protection) Act 1972*) from the baggage of a passenger bound for Colombo. Three persons from Tamil Nadu were arrested. The specimens had been bound for aquaria and pet stores in Bangkok and Kuala Lumpur. The tortoises, which included hatch-

lings, were discovered during x-ray examination of luggage. They had been sedated and were later handed over to the Forest Department.

Large numbers of Indian Star Tortoises continue to be seized at Chennai Airport: most recently, on 8 May 2006, 200 specimens were seized from a passenger bound for Bangkok; and, on 5 June, 540 specimens en route to Kuala Lumpur were seized and one person arrested.

In late 2005, wildlife department officials in Chennai arrested the kingpin of a smuggling racket involved in the illegal export of Indian Star Tortoises to Malaysia, for onward shipment to countries including Singapore and the USA. Preliminary investigation by the authorities revealed that the suspect had purchased the tortoises from hunters from Madanapalli in Andhra Pradesh, who had collected the reptiles from the wild.

Wildlife Protection Society of India, www.wpsi-india.org/news/21122005.php, 21 December 2005; www.wpsi-india.org/news/10012006.php, 10 January 2006; *The Hindu*, 26 March 2006: www.thehindu.com/2006/03/26/stories/2006032613720400.htm; Belinda Wright, Executive Director, Wildlife Protection Society of India, in litt., 6 June 2006; WWF-India

SOUTH-EAST ASIA INDONESIA

Three large seizures of Humphead Wrasses *Cheilinus undulatus* have been made in Indonesia since the species was listed in CITES Appendix II in 2005:

On 13 January 2006, 207 live specimens were seized from a fisherman in Bunaken National Marine Park - an important protected area for marine species. The fish were released into the water.

On 25 January 2006, Water Police working with the North Sulawesi Management Unit of Natural Resources Conservation seized 450 Humphead Wrasses from a fisherman in Likupang, North Minahasa District. The surviving 357 wrasses were released. In both the above cases, the fishermen were charged under Act No. 5/90, Government Regulation 8/99, Ministry Decree of Ministry of Forestry of Republic of Indonesia No. 447/2003 and await court proceedings.

On 30 June 2006, Fisheries Quarantine officers at Manado Airport seized 36 Humphead Wrasses. The specimens had been harvested in Malayang, Manado, and were destined for Hong Kong. Only 25 survived and have been released in Bunaken National Marine Park. An Indonesian citizen was detained for questioning.

TRAFFIC Southeast Asia press release: www.traffic.org/news/Airport_law.html, 11 July 2006

PHILIPPINES

On 16 March 2006, at a cargo warehouse at Ninoy Aquino International Airport, authorities seized two crates containing 144 snakes and reptiles. The shipment, which was not accompanied by export documents, was bound for a trader in Penang, Malaysia. The consignment comprised 52 Philippine Pit Vipers *Trimeresurus flavomaculatus* (four dead), 14 monitor lizards *Varanus* sp. (CITES I/II), one Philippine Cobra *Naja philippinensis* (II), three Reticulated Pythons *Python reticulatus* (II), 22

sea snakes, a mangrove snake, 20 sailfin lizards (one dead) and 20 skinks, all believed to be wild-caught.

All wildlife in the Philippines is protected and only captive-bred reptiles are allowed to be exported, provided permits are obtained.

The Star (Malaysia), 25 March 2006; TRAFFIC International

SINGAPORE

In February 2006, at Changi Airport, 83 wild orchid plants belonging to 24 species (including *Dendrobium brymerianum*, *D. pachyphyllum*, *D. secundum*, *Tris plectra*, and *Vanda testacea* - CITES II) were seized from a Singaporean national returning from Thailand. No CITES export permit accompanied the consignment which had been purchased in Chiang Mai. The plants were confiscated and are being kept in the custody of the Agri-Food and Veterinary Authority (AVA) (the CITES Management Authority of Singapore), for research and conservation purposes. The offender was fined S\$5000 (USD3160).

On 13 February 2006, at Changi Airport, Immigration and Checkpoints Authority officers detained a Singaporean national who was attempting to import 11 Blue-eyed Cockatoos *Cacatua ophthalmica* and one Black-capped Lory *Lorius lory* (both CITES II) in his luggage. The birds had been tranquilized and wrapped in cloth or paper. Three had died and the others were unconscious. Preliminary findings reveal that the man had bought the birds from a market in Indonesia. Investigations continue.

On 13 June 2006, AVA enforcement officers seized an illegal cargo of freshwater turtles from a ship that had arrived at the Jurong

Fishing Port from Tembilahan in Sumatra, Indonesia. This was the first significant confiscation since Singapore's revised *Endangered Species (Import and Export) Act 2005* (ESA) came into force on 1 March 2006 and the first case in Singapore involving trans-shipment without a valid permit from the exporting country - an enforcement action that would not have been possible under the previous legislation.

The shipment of 72 crates contained 2520 South-east Asian Box Turtles *Cuora amboinensis* (CITES II) and non-CITES listed Malayan Softshell Turtles *Dogania subplana* and Asian Leaf Turtles *Cyclemys dentata*. A fake CITES permit was produced in an attempt to evade prosecution. The captain of the Indonesian ship pleaded guilty to the illegal transportation and was sentenced to a term of five months' gaol and fined SGD20 000 (USD12 500). It is likely that he will spend an additional two months in prison because he is unable to pay the fine.

The captain and another crew member claimed that the ultimate destination market for the box turtles was Hong Kong via the Indonesian island of Batam, according to AVA's Wildlife Regulatory Branch Head, Lye Fong Keng. "We are working closely with the Indonesian authorities to repatriate the box turtles, and to see that the exporters in Sumatra are apprehended", said Lye.

Under the revised ESA, violators now face fines of up to SGD50 000 (USD31 362) per specimen, subject to a maximum of SGD500 000 (USD313 620), and a maximum gaol term of two years upon conviction.

Agri-Food and Veterinary Authority; *The Straits Times (Singapore)*, 16 February 2006: www.wildsingapore.com/news/20060102/060216-1.htm; TRAFFIC Southeast Asia

THAILAND

On 10 January 2006, police in Phitsanulok province arrested a man in illegal possession of

OFFICIALS AT BANGKOK AIRPORT SEIZING A LARGE CONSIGNMENT OF PANGOLINS AND FRESHWATER TURTLES



JAMES COMPTON / TRAFFIC SOUTHEAST ASIA

OCEANIA

AUSTRALIA

69 Malayan Pangolins *Manis javanica* (CITES II) (240 kg) which had been concealed inside a sedan en route to deliver the goods for sale. The suspect confessed this was his second time smuggling the animals, and that he received 5000 baht (USD133) per trip. The animals, which are protected by law, were confiscated and passed on to forestry officials.

On 7 April 2006, in the north-eastern province of Nong Khai, bordering Lao PDR, Customs and immigration officials arrested a Thai government official working at the Friendship Bridge toll booth at the bridge border checkpoint. He and his accomplice were attempting to export some 80 live pangolins *Manis* and the remains of dead animals (9 kg), to China. The two men were charged with violating laws protecting wildlife.

On 26 June 2006, authorities at Don Muang Airport, Bangkok, seized a shipment of 245 Malayan Pangolins *Manis javanica*, 63 Black Marsh Turtles *Siebenrockiella crassicollis* and one Malayan Snail-Eating Turtle *Malayemys subtrijuga* (all CITES II). The cargo was in transit from Penang, Malaysia, to Lao PDR. Two Thai nationals were held for questioning.

The animals had been concealed in 60 crates falsely declared as Red-eared Sliders *Trachemys scripta elegans* - an unprotected North American freshwater turtle. As the seized species are listed in CITES Appendix II, trade is legal only with a valid CITES permit. The pangolins, however, are subject to a zero quota which means that all international trade is illegal. Thailand has become a major transit hub for pangolins smuggled from Malaysia and Indonesia en route to Lao PDR, Viet Nam and China.

www.thaisnews.com/news_detail.php?newsid=157932, 11 January 2006; <http://letna.mcot.net/query.php?nid=8007>, 7 April 2006; www.traffic.org/25/network9/ASEAN/index.html

VIET NAM

On 6 February 2006, police officers of Quang Ninh province confiscated 61 Crab-eating Macaques *Macaca fascicularis* (CITES II) (181 kg) from a lorry. Three people were apprehended.

On 28 February 2006, Quang Ninh forest rangers detected another lorry at the Bai Chay Ferry Landing carrying 100 Crab-eating Macaques.

On 2 March 2006, transport police from Ha Long City in Quang Ninh province stopped a coach that was found to be carrying 147 Crab-eating Macaques (291 kg); eight specimens had perished. Three men in the vehicle told the authorities that they had received the animals in Hai Phong City and were taking them to the Mong Cai border gate, on the border with China, in Quang Ninh province.

The species is listed in Group IB of Decree 48 which means that specimens may be traded with a permit.

http://english.vietnamnet.vn/service/printversion.vnn?article_id=770763, 3 March 2006; *The People's Police*, Issue 331, 9 February 2006, translated by Education for Nature - Vietnam

On 4 November 2005, at Perth District Court, five men were acquitted of illegally taking Patagonian Toothfish *Dissostichus eleginoides* from Australian waters. It was the second time the men were tried for the alleged offences after a jury last year was unable to make a decision. The men were crew members of the *Viarsa*, which was chased for 21 days across the Southern Ocean by the Australian Navy before being apprehended (see *TRAFFIC Bulletin* 20(1): 37). The men, from Spain, Uruguay and Chile, were on bail during the trial.

On 23 March 2006, the Australian Fisheries Management Authority (AFMA) seized two Chinese trawler vessels inside the Australian Fishing Zone north-west of the Wessels, off the Northern Territory coast. Initial investigations by AFMA officers on board the first vessel uncovered approximately 4000 kg of reef fish and 3000 kg on board the second vessel.

Both vessels resisted apprehension and opposed boarding. The boat was escorted to Darwin and, following investigations by AFMA, the captains of both vessels were charged with illegal fishing and resisting apprehension.

On 12 April 2006, at Perth Magistrates' Court, Mitsuhiro Yokota pleaded guilty to six charges of attempting to export native animals under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. He was fined AUD24 000 (USD18 000) and a further AUD7000 after pleading guilty to further charges relating to possession under state wildlife legislation.

Investigations began in August 2005 after two reports from members of the public to a 24-hour Customs Hotline that detailed suspicious activity witnessed on Scarborough Beach. Customs officers arrested Yokota as he attempted to leave Perth International Airport on a flight to Singapore in March. X-rays of his luggage revealed the presence of a number of reptiles. During the baggage search, officers found six live, native Shingleback Lizards *Tiliqua rugosa* inside a plastic container.

Mr Yokota will be held in custody for a maximum of six months or until the fine has been paid.

On 20 April 2006, at Downing Centre District Court, Sydney, Henri Robert Morgan pleaded guilty to charges under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* of attempting to export cockatoo and Galah *Eolophus roseicapillus* (CITES II) eggs out of Australia. He was also charged under the *Criminal Code Act 1995* with hindering a Customs officer by smashing the eggs hidden under his clothing following detection.

Morgan had tried to leave Sydney International Airport for South Africa on 16 October 2004. After arousing the suspicion of Customs officers, he slapped his body when

detained for a frisk search, smashing all but two of the 24 bird eggs under his clothing. DNA tests on the eggs revealed that eight were Sulphur-crested Cockatoos *Cacatua galerita* (II), nine were Leadbeater's Cockatoos *Cacatua leadbeateri* (II) and seven were Galahs.

On the attempted exportation charge Morgan was sentenced to two years' imprisonment, and 18 months' in gaol for hindering a Customs officer. He will serve 18 months' imprisonment, after which he will be subject to a 12-month AUD1000 (USD752) good behaviour bond.

In May 2006, 11 Indonesian fishermen were gaoled after being caught poaching sea cucumbers in Australian waters north of Broome, Western Australia. They were on board two boats intercepted by the Navy at Scott Reef.

One of the captains has been sentenced to seven months in gaol, while the other captain and nine crew members have been fined. They will spend between three and six months in gaol because they could not pay the penalties.

Another man is yet to face court while seven people, who were not charged, are believed to have been repatriated to Indonesia.

www.abc.net.au/news/items/2005/11/1498373.htm?perth,5 November 2005; www.theage.com.au/news/national/jury-sinks-canberra-in-patagonian-toothfish-case/2005/11/06/1131211945815.html, 7 November 2005; *Joint Media Release, Ministers for Defence, for Justice and Customs, and for Fisheries, Forestry and Conservation*, 24 March 2006; www.mffc.gov.au/releases/2006/06031a.htm; *Australian Customs media releases*, 13/21 April 2006; www.abc.net.au/rural/news/content/2006/s1655398.htm, 5 June 2006

AMERICAS

CANADA

Although all abalone fisheries have been closed to all user groups along the coast of British Columbia (BC) since December 1990, continued harvesting is one of the biggest threats to their survival. The species targeted is the Northern or Pinto Abalone *Haliotis kamtschatkana* which is patchily distributed and has been declining in numbers and distribution in surveyed areas of BC since the late 1970s. The molluscs are prized for their meat, and for the decorative, mother-of-pearl lining of their shells. According to surveys undertaken by Fisheries and Oceans Canada (DFO), which is responsible for the management of Canada's oceans and freshwater resources, over 70% of the sites that formerly had an abundance of abalones now contain no abalones at all. The Northern Abalone was assigned a Threatened status by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in April 1999. A recovery team was formed in November 2001 which has prepared a National Recovery Strategy for this species in BC. The recovery team considers illegal harvest and low recruitment to be the most significant threats to *H. kamtschatkana*, affecting both its recovery capacity and reproductive abilities.

Large numbers of abalones have been illegally harvested over the past year and the follow-

ing cases are among the most significant in BC that have come to the attention of the authorities:

On 13 October 2005, at Prince Rupert Provincial Court, Kendall Ross and Floyd Sampson from the northern community of Lax Kw'alaams pleaded guilty to harvesting abalones illegally. During sentencing, the court accepted the recommendations of the Prince Rupert Restorative Justice Program, which stressed the importance of taking into account both fisheries conservation objectives and aboriginal perspectives in imposing a sentence on First Nations offenders. Under the terms of the probation order, DFO will be assisting Ross and Sampson to complete a research project designed to educate them on the detrimental effects of harvesting abalones. They will also be required to present their research project to local schools, at their own expense, and perform 80 hours of supervised community service.

On 14 October 2005, at Ucluelet Provincial Court, John Albert Frank, of Ahousat was fined CAD35 000 (USD30 400) after pleading guilty to one count of unlawful possession of abalones. CAD30 000 of the fine will be directed towards DFO for the purpose of promoting and fostering the recovery of abalone stocks on the west coast of Canada, and for the conservation and protection of abalones and abalone habitat. Frank was apprehended in the city of Port Alberni in 2004 with 196 abalones in his possession.

On 20 February 2006, fisheries officers seized the largest consignment of illegally caught abalones in BC's history, after receiving reports of a vessel acting suspiciously in waters near Port Edward. Camouflaged officers spent several nights watching the vessel before stopping a heavily laden vehicle in the vicinity. Inside they discovered about 1130 kg of abalones still in the shell, most still alive. The molluscs - estimated at up to 11 000 individuals - were returned to the water where their progress is being monitored. Three men were detained. According to DFO, the suspects had been operating for some time and the abalones seized had been taken from all along the coast, not just locally. It is the DFO's opinion that the impact of these poachers on the conservation of the species is likely to have been significant (DFO, pers. comm. to E. Cooper, TRAFFIC North America, 8 March 2006). Fisheries officials are still preparing the case against the three men.

In March 2006, at Vancouver Provincial court, Sin Kae of the Rupert Fish Market, Vancouver, was fined CAD10 000 after pleading guilty to the unlawful possession of abalones. During a routine inspection of his shop, fishery officers seized abalones which were identified by the DFO Molecular Genetics Laboratory as wild *Haliotis kamtschatkana*. CAD500 of the penalty constituted a fine and the remaining CAD9500 is directed towards the DFO Molecular Genetics Laboratory at the Pacific Biological Station in Nanaimo which conducts forensic analysis of seized abalone stock and is responsible for providing evidence on abalone species and stock identification.

A woman was detained earlier this year at Vancouver International Airport, BC, on arrival from Prince Rupert (BC). She was met from

the aircraft by officials from the DFO and the Royal Canadian Mounted Police (RCMP) following a tip-off from security at Prince Rupert Airport that she had boarded the plane with a suspected illegal consignment of abalones. Thirty-four specimens were found inside a cooler in her possession.

On 17 May 2006, a man was arrested by the RCMP in Prince Rupert after being found in possession of a bag of abalones. An investigation led officers to a hotel where a further two bags were found; 34 abalones were seized.

Both individuals in the latter two cases face charges.

On 15 May 2006, at Pincher Creek Provincial Court, Martin Benjamin Walter, Steven Darrell Walter and Edward John Walter, all of Livingstone Hutterite Colony, south-west of Calgary, were fined a total of CAD44 000 for trafficking parts from poached eagles, hawks and owls. The fine was based on the sale of parts from three Bald Eagles *Haliaeetus leuccephalus* (CITES I), one Golden Eagle *Aquila chrysaetos* (II), one Great Horned Owl *Bubo virginianus* (II) and one Rough-legged Hawk *Buteo lagopus* (II). Four more people will stand trial in October.

The men were caught during an undercover investigation (Operation Chinook) which had unearthed parts of at least 37 Bald Eagles, 24 Golden Eagles and 22 other birds of prey when the investigation was concluded in January 2005. Hundreds of parts from poached birds of prey were found in Pincher Creek, Wetaskiwin and Cardston during two undercover operations. Most of the parts, including feathers and talons, are sold to make Native ceremonial objects or costumes.

On 21 June 2006, at Bridgewater Provincial Court, Halifax, a Nova Scotia fishing company was ordered to pay what amounts to the largest fine in Canadian history, following a five-year investigation. Ivy Fisheries Ltd and five fishermen linked to the company were fined CAD839 734.82 (USD751 440.55) for violating the federal *Fisheries Act*.

The company was found guilty of a range of offences including failing to return unlicensed species to the water, selling fish illegally, fishing two or more licences concurrently, and failing to enter confirmation numbers in log books. They had failed to document immediately a catch of bluefin tuna *Thunnus* which, the judge ruled, could lead to fishermen discarding smaller fish in favour of larger ones and jeopardize conservation efforts. Scott Mossman, the fishery officer who led the investigation, said it is likely the fishermen were catching the bluefin tuna with shark gear, a practice that allowed them to catch 135 bluefin in less than three months.

The investigation (Operation Octopi) began in late 2000 when fisheries officials noticed irregularities in the company's records and that certain boats appeared to be bringing in large catches. Some 30 000 documents were seized from the Sambro-based company in 2001. The trial began in 2003 and involved an international trail that tracked 176 tagged bluefin tuna from where they were caught to the distant clients

who bought them. "We had to trace every fish from the water to the end sale and see who profited from it", Mossman said.

Fisheries and Oceans Canada press releases, 13/14 October 2005: www.pac.dfo-mpo.gc.ca/ops/fm/shellfish/abalone/default_e.htm; www.comm.pac.dfo-mpo.gc.ca/pages/release/p-releases/2005/nr063_e.htm; www.comm.pac.dfo-mpo.gc.ca/pages/release/p-releases/2005/nr064_e.htm; TRAFFIC Bulletin 20(3):118; www.canada.com/vancouver/news/westcoastnews/story.html?id=810651f4-2bd4-453f-9f5d-62db52c2600a; 22 February 2006; Fisheries and Oceans Canada, pers. comm. to E. Cooper, 8 March 2006; Calgary Sun (Canada), Fisheries and Oceans Canada (DFO), 31 March 2006; http://cnews.canoe.ca/CNEWS/Canada/2006/05/26/11599957.html; The Edmonton Journal, 22 June 2006; The Daily News (Halifax), 22 June 2006

COLOMBIA

In April 2006, police in Sucre detained 218 people for their part in the illegal hunting and trade in Red-eared Slider Turtles *Trachemys scripta*. More than 10 000 of these freshwater turtles were recovered and returned to the wild. In one raid alone, police detained 52 people involved in transporting 5000 specimens by lorry for sale to markets along the coast.

Traditionally the hunting of turtles increases in Colombia during Lent or Semana Santa - the Catholic Holy Week preceding Easter - as the meat is used by coastal peoples to make a special dish.

*TRAFFIC South America
www.caracol.com.co/nota.asp?id=275133*

WWF-Germany reports on the consumption of marine turtles during Lent in Latin America - with a case study of this tradition in Mexico. *When Reptiles Become Fish: On the Consumption of Sea Turtles during Lent* can be downloaded at: www.wwf.de/presse/pressearchiv/artikel/02974/index.html

USA

On 10 April 2005, Jianyang Huang, Zi Qi Tan, and Yao Quin Zhuang of San Francisco were convicted in San Mateo County, California, of illegally removing 56 abalones from San Mateo County waters on 4 July 2004 during a moratorium on fishing for abalones without a licence. Tan and Zhuang were convicted of both charges while Huang, the group's lookout, was acquitted of the second misdemeanour. All seized diving gear was forfeited, the defendants fishing licences were revoked and they were banned from commercial and sport fishing for life.

In 1997, commercial abalone fishing south of San Francisco to the Mexican border was banned owing to a dwindling population, and White Abalone *Haliotis sorenseni* was declared endangered under the *Marine Life Protection Act*. During the abalone fishing season, divers are limited to catching three specimens a day north of San Francisco.

In April 2006, a Chinese restaurant cook received three years' probation and a fine after pleading no contest to poaching 20 abalones in November 2003.

The Daily Journal (USA): www.smdailyjournal.com/article_preview.php?id=50633

SUSTAINABLE WILD COLLECTION OF MEDICINAL AND AROMATIC PLANTS

The Need for an International Standard

Britta Pätzold, Danna Leaman, and Susanne Honnef

Based on a review of published medicinal floras, Schippmann, Leaman and Cunningham (in press) estimate that 50 000 to 70 000 plant species are used in traditional and modern medical systems throughout the world. The same authors propose that approximately 3000 medicinal and aromatic plant (MAP) species are involved in international trade, based on the number of documented species imported to and exported from major centres of MAP trade. The great majority of MAP species in trade are wild-collected (Lange and Schippmann, 1997; Srivastava, Lambert and Vietmeyer 1996; Xiao Pen-gen, 1991). Although wild collection can provide incentives for conservation and sustainable use of forests and other important areas for plants, over-harvesting, land conversion, and habitat loss increasingly threaten a considerable portion (approximately 15 000 species, or approximately 21 per cent) of the world's MAP species and populations (Schippmann *et al.* in press). Sustainability issues are addressed in a variety of standards and guidelines that are relevant for wild collection of MAP, for example, as set out by the Forest Stewardship Council (FSC), Fairtrade Labelling Organizations International (FLO) and the International Federation of Organic Agriculture Movements (IFOAM).

Organic certification of wild-harvested plants is increasing, particularly in Latin America, Asia, and Africa (Yussefi, 2006). Baraibar and Willer (2006) note "a growing interest in organic wild products by the body care medicinal herb sectors". It is likely that medicinal and aromatic plants (MAP) number significantly among wild-collected species for which organic certification is of interest to collectors, traders, manufacturers, regulators, and consumers (Leaman *et al.*, 2006).

However, currently available certification criteria and standards addressing wild collection, such as organic certification schemes, often do not provide sufficient guidance to ensure the long-term survival of wild production. Approaches to sustainable MAP wild collection that engage local, regional and international collection enterprises and markets are urgently needed to provide specific guidance for industry, collectors, and other stakeholders on sustainable sourcing practices.

Compared with timber, food crops, and other products currently included in organic and other sustainable use certification schemes, wild collection of MAP presents some weighty challenges, including: the large number and diversity of MAP taxonomic groups, each with unique circumstances of ecology, habitat, and pressures on the resource; the need to develop good collection practices specific to each species and situation; unpredictable and often unrecognized environmental factors that influence annual yield of wild populations; unclear land and resource tenure and management authority; the

large number and variety of products, uses, and markets; and long, complex supply chains between sources and markets. Added to these challenges are limited recognition of the economic, social, and ecological value of wild MAP resources, and a widespread uncertainty about who is responsible for ensuring that wild MAP resources are used sustainably (Leaman *et al.*, 2006).

A joint initiative of the German Federal Agency for Nature Conservation (BfN), WWF Germany, TRAFFIC, IUCN-the World Conservation Union, IUCN Canada, and the IUCN Medicinal Plant Specialist Group (MPSG), is under way to address this gap by developing principles, criteria and indicators defining an international standard for good practice in the sustainable wild collection of medicinal and aromatic plants. An international, interdisciplinary Advisory Group has been formed to involve relevant stakeholders from conservation, social and economic development, trade and industry sectors in the process of developing and testing a standard for sustainable wild collection of MAP.

The International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)

The purpose of the ISSC-MAP, as defined by the Advisory Group, is to ensure the continued use and the long-term survival of MAP species and populations in their habitats, while respecting the traditions, cultures and livelihoods of all stakeholders. The objective of the standard is: to provide a framework of principles and criteria that can be applied to the management of MAP species and their ecosystems; to serve as a basis for monitoring and reporting; and, to recommend requirements for sustainable wild collection of MAP.

A first draft of this standard was completed in November 2004 for discussion with members of the Advisory Group (Leaman, 2004). It consisted of four separate practice standards: I. ecosystem and MAP resource management; II. wild collection of MAP resources; III. domestication, cultivation, and enhanced *in situ* production of MAP resources; and, IV. rights, responsibilities, and equitable relations of stakeholders). A workshop on the Isle of Vilm (December 2004) provided a discussion forum for the members of the Advisory Group on this first draft standards document and other process-related issues.

A second draft, distributed to the Advisory Group in April 2005, condensed the original four practice standards into a single standard with ten principles, related criteria, and proposed indicators (Leaman and Salvador, 2005). Based on comments from the Advisory Group, a field consultation phase late in 2005 (Salvador, 2005), and a second workshop on the Isle of Vilm in December 2005, a third (current) working draft of the ISSC-MAP has been prepared (MPSG, 2006). This draft sets out six principles and 18 criteria, addressing ecological, social and economic requirements for the sustainable wild collection of MAP. The principles set out in the current draft are listed in Table 1. The draft will be subject to further testing.

SECTION I: WILD COLLECTION AND CONSERVATION REQUIREMENTS**Principle 1. Maintaining Wild MAP Resources**

Wild collection of MAPs shall be conducted at a scale and rate and in a manner that maintains species and populations over the long term.

Principle 2. Preventing Negative Environmental Impacts

Negative impacts caused by MAP collection activities on other wild species, the collection area, and neighbouring areas shall be prevented.

SECTION II: LEGAL AND ETHICAL REQUIREMENTS**Principle 3. Complying with Laws, Regulations, and Agreements**

MAP collection and management activities shall be carried out under legitimate tenure arrangements, and comply with relevant laws, regulations, and agreements.

Principle 4. Respecting Customary Rights

Local communities' and indigenous peoples' customary rights to use and manage collection areas and wild-collected MAPs shall be recognized and respected.

SECTION III: MANAGEMENT AND BUSINESS REQUIREMENTS**Principle 5. Applying Responsible Management Practices**

Wild collection of MAPs shall be based on adaptive, practical, participatory, and transparent management practices.

Principle 6. Applying Responsible Business Practices

Wild collection shall be undertaken to support quality, financial, and labour requirements of the market without sacrificing sustainability of the resource.

Table 1. ISSC-MAP working draft (3) in brief: principles

In parallel with, and also linked to the drafting process, an implementation study was carried out that assesses how the standard might be used by different stakeholder groups and under different scenarios. The study confirmed a major demand for such a standard while illustrating the complexity of uptake (Kathe and Gallia, 2006).

Scope of application and implementation of the ISSC-MAP

A key aim has been to develop a standard that is applicable to the wide array of geographic, ecological, cultural, economic, and trade conditions in which wild-collected MAP are found. The standard addresses wild collection of MAP materials for commercial (rather than subsistence) purposes. It focuses on good ecological practices but also aims to support responsible social standards and business practices that affect collectors, collection operations, and the environments in which MAP resources are collected. Harmonization with appropriate standards relating to ecosystems, fair trade, production, and product quality, is considered an important avenue for developing and implementing the ISSC-MAP.

In order to be successfully applied, this standard must be relevant and practical to different scales of operation, from autonomous groups of collectors to enterprises fully supported by large companies; and from low-volume collection to large-scale collection operations. In developing this standard, the costs associated with field assessment, monitoring, and evaluation were also taken into consideration, as well as the requirements of existing or new institutions and resource management authorities (Leaman *et al.*, 2006).

Eight scenarios in which the ISSC-MAP might be effectively implemented have been identified (Salvador and Pätzold, 2005), including voluntary, self-regulating efforts (first-party claims); codes of practice adopted by trade associations or through industry policy (second-party claims); and independent certification or labelling

schemes backed by governments, NGOs, or certification bodies (third-party claims).

To be effective, any standard must have tangible, beneficial results for producers, resource managers, and consumers. For producers (collectors, manufacturers, retailers, and others involved in the chain of supply), it is clear that there must be a market advantage resulting from adherence to this standard, in the form of improved access to consumers, premium prices, and/or improved company image. Resource managers (who are in many cases also the producers) must have confidence in the reliability and rigour of the standard, as well as the capacity to monitor its application at the collection site. For consumers, there must be evidence that sustainably collected MAP products are better products, and therefore worthy of a higher price and greater loyalty to a product, manufacturer, or retailer. However, are consumers sufficiently interested in MAP resource sustainability (in addition to product quality, fair trade practices, etc.) as a responsible industry approach that deserves their support? This is one of the major questions and challenges in the development of this standard which is still to be addressed (Leaman *et al.*, 2006).

Field Consultation of the ISSC-MAP

The relevance and practicality of the second draft standard was tested in October to November 2005 through field consultations with staff based in five existing MAP field projects. The projects were selected from different geographical regions and representing different socio-economic backgrounds: *Company Andelic d.o.o.* in Bosnia and Herzegovina, the non-profit *Iracambi Medicinal Plants Project* in Brazil, the state-owned area of *Wanglang National Nature Reserve and Baima State Forest* in China, the community-based *Agro-artesanal Producers' Association (AAPPSME)* in Ecuador, and the non-profit *Sustainably Harvested Devil's Claw* project in Namibia.

WILD COLLECTION OF *HELICHRYSUM* IN BOSNIA AND HERZEGOVINA - AN EXAMPLE

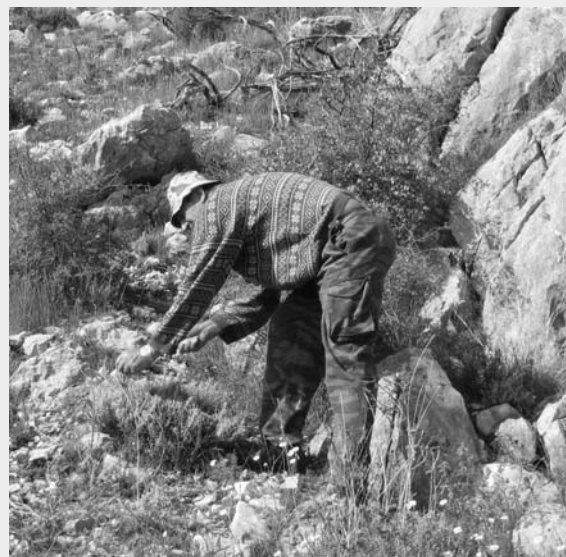
THE BALKANS are the most important countries in Europe for the collection and export of medicinal and aromatic plants (MAP) and have a long tradition of wild collection. According to Lange (2003), the East and South-east European countries are generally a cheap source of MAP material. Most exports from this area are destined for Germany (Lange, 2003). Although legal frameworks for the collection and commercial use of MAP exist, implementation of control mechanisms by state institutions for harvesting and trade is poor. Control of collected amounts can be achieved only in part through organic certification.

A field consultation was undertaken to Trebinje in the south-east of Bosnia and Herzegovina, to the area where Radovan Anđelić and his company *Anđelić d.o.o.* harvest wild plants to produce certified organic essential oils - primarily for export - and medicinal herbs for the domestic market. In the former Yugoslavia, the Trebinje area was well known for its sage *Salvia* production. However, as a result of the war in the first half of the 1990s, the national herb industry of Yugoslavia (which was organized through five big state-owned enterprises, with two based in Croatia, two in Montenegro and one in Trebinje) collapsed. As with other industries, Albania took over Bosnia and Herzegovina's role in the market and today the former big companies have been replaced by smaller herb companies and exports are now lower than before the war (Lange, Pätzold and Bahtijarević, 2005).

The focal plant of this field consultation was *Helichrysum italicum* (local name: smilje), an aromatic dwarf shrub belonging to the daisy family (Asteraceae). The plant grows in the Mediterranean in open, dry and stony places with bushy vegetation of low density, coverage and height. It is mainly collected for commercial purposes, not for local use and is used mainly in cosmetics and aromatherapy. In Bosnia and Herzegovina, the plant is almost solely harvested on state-owned land, once or twice a year.

Currently *Anđelić d.o.o.* obtains its raw plant materials from about 120 collector families. Collecting herbs is in most cases an additional rather than the main source of income for the local people.

A workshop organized as part of the field consultation in Trebinje revealed a strong interest in and need for a standard such as the ISSC-MAP. Local companies in particular, but also harvesters and representatives from authorities, science and development agencies, were keen for such a standard to be applied. They agreed, however, that this would be best met by State rather than by private initiatives owing to overlapping responsibilities at government level, and poor law enforcement through local authorities. Workshop participants also pointed out that the implementation of sustainability criteria must be enforced through the supply chain by external buyer companies, which requires consumer awareness (Lange, Pätzold and Bahtijarević, 2005). Further co-operation with local companies is envisaged in the upcoming pilot implementation phase.



HARVESTING *HELICHRYSUM ITALICUM* IN BOSNIA AND HERZEGOVINA

B. PÄTZOLD



Results from the evaluation of these field consultations (Salvador, 2005) have been incorporated into the further drafting and implementation process. An additional field consultation focusing on the working draft (June 2006) is planned later this year with the Organization for Revitalization of Local Health Traditions (FRLHT), India. A pre-audit of the ISSC-MAP working draft indicators, focusing on overlaps and potential harmonization with organic certification, is organized for August 2006 in the project *Conservation of Eastern European medicinal plants: Arnica montana in Romania*, located in the Apuseni mountains. This pre-audit is organized together with WWF-UK, WWF DCP (Bucharest), USAMV (University of Agriculture and Veterinary Medicine) in Cluj-Napoca, the Institute for Market Ecology (IMO), local project staff and the community of Garda-de-Sus.

Workshop on potential implementation scenarios in Bosnia and Herzegovina

With the third and final working draft of the standard approaching completion, the discussion and development of potential implementation scenarios and strategies has become a priority for the ISSC-MAP process. On 5 May 2006, a workshop on potential implementation scenarios for the ISSC-MAP, organized by WWF Germany, TRAFFIC, and the Medicinal Plant Specialist Group of IUCN-the World Conservation Union, provided a discussion forum for more than 50 participants, including representatives from government conservation agencies, natural (organic) herbal product traders, manufacturers and retailers, herbalists, organic certification bodies and conservation groups. The workshop was organized as a side event to the 1st IFOAM International Conference on Organic Wild Production, held in Teslic, Bosnia and Herzegovina, from 3 to 4 May 2006. The workshop opened with presentations charting the history of the development of the ISSC-MAP thus far, which has included a series of consultation workshops, individual interviews and field assessments of the applicability of the draft standards in Brazil, Ecuador, India, China and Bosnia and Herzegovina. Individual participants representing scientists, certifiers, industry, authorities and MAP projects then gave their views on how the ISSC-MAP would help them to achieve their objectives. The standard was seen to have particular relevance in Eastern Europe, where, in Bosnia and Herzegovina alone, more than 100 000 families rely on the harvest of these and other wild plants for income. Whether the standard is applied on a voluntary basis or incorporated into national laws, information provision (addressing all actors along the supply chain, consumers and authorities) was identified as a crucial part of any ISSC-MAP implementation strategy and shall be, depending on the country, one of the first steps. Workshop participants emphasized that sufficient technical support on the ground has to be provided to enable the ISSC-MAP to be met.

ARNICA ARNICA MONTANA

A project designed to test the ISSC-MAP working draft indicators will be applied to *Arnica montana* populations in Romania in August 2006 (see left). *Arnica* has been used for medicinal purposes for centuries. Its primary agents are various essential oils (over 50), flavonoids, and bitter agents. Depending on the application, the flowers, roots and whole plant are used in preparations that are almost exclusively applied externally. Ointments promote the healing of wounds and prevent infections and bleeding gums are treated with an *Arnica* solution for gargling. In herbal medicine, *Arnica* is mainly used as a stimulant for the heart, to improve blood circulation, to mitigate rheumatism and to control bruising.

The plant is both wild-collected and cultivated. The natural habitat of wild *Arnica* ranges throughout the European continent, from south Norway southwards to south Portugal, from the Apennine Mountains to the Carpathians. However, populations are decreasing in size and number especially in central Europe, owing to over-exploitation and habitat destruction. *Arnica* is a fairly sensitive plant with special habitat demands. It grows only in poor, neutral to acid soils, mostly in mountain meadows with extensive grazing. Intensive farming is deadly to this species and the plant does not re-migrate into the old habitat for decades. In most central European countries, *Arnica* is endangered and now protected.

Sources: Kathe, W, A. Hempfling, A. Fischer, W. (2002). *Healing Power from Nature*. WWF/TRAFFIC Europe-Germany; TRAFFIC International

Outlook: Pilot implementation of the ISSC-MAP (2007-2010)

Currently a concept is being developed aimed at carrying out a pilot implementation of the ISSC-MAP in several projects in a variety of diverse settings worldwide. In this pilot phase, on-the-ground experience will be obtained which will be incorporated both within the standard, and in the development of related guidance. Funding for the pilot implementation is only partly secured; it is also hoped to obtain funds to carry out an assessment of consumer interests.

All ISSC-MAP-related documents can be downloaded from the project website: www.floraweb.de/MAP-pro/

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