

VOL. 22 NO. 3

3

TRAFFIC

BULLETIN

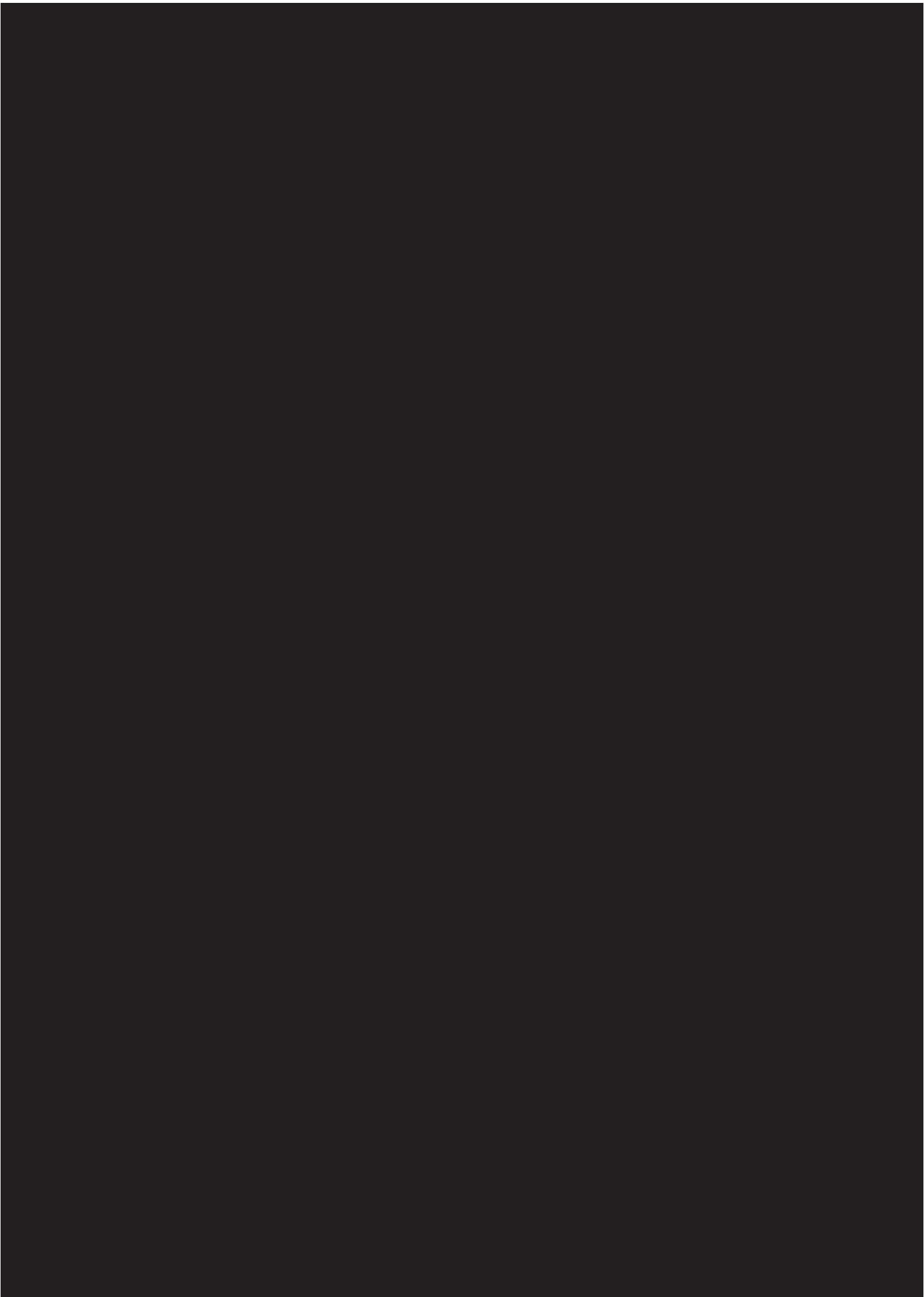
TRADE IN WILD MEAT
IN CENTRAL AFRICA

WEST AFRICA'S
MARKET FOR
FROG MEAT

IVORY IN
ETHIOPIA

MARCH 2010

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





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 WWF and IUCN.

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.

The *TRAFFIC Bulletin* is available free of charge. Quotation of information appearing in the news sections is welcomed without permission, but citation must be given. Reproduction of all other material appearing in the *TRAFFIC Bulletin* requires written permission from the publisher.

MANAGING EDITOR *Steven Broad*

EDITOR AND COMPILER *Kim Lochen*

SUBSCRIPTIONS *Susan Vivian*
(E-mail: bulletin@traffic.org)

The designations of geographical entities in this publication, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of TRAFFIC or its supporting organizations concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Any opinions expressed are those of the writers and do not necessarily reflect those of TRAFFIC, WWF or IUCN.

Published by TRAFFIC International,
219a Huntingdon Road, Cambridge, Cambs.,
CB3 0DL, UK.

© TRAFFIC International 2010
ISSN 0267-4297
UK Registered Charity No. 1076722

Cover illustration: African Tiger Frogs
Hoplobatrachus occipitalis being dried for subsequent sale,
southern Burkina Faso, January 2008.
(© Meike Mohneke)

This page, from top:
Sumatran Tiger (© David Lawson / WWF-UK)
Boy selling bushmeat, Cameroon
(© Sandra Mbanefo Obiagio / WWF-Canon)
Frog market, Lolo, Nigeria (© Abiodun Onadeko)
Agarwood seizure, China (© Liu Congxin)
Ivory bangles, Addis Ababa (© Lucy Vigne)



Funding for the printing and distribution of this issue of the *TRAFFIC Bulletin* is generously provided by The Rufford Maurice Laing Foundation.

Printed on recycled paper by Portland Print,
Kettering, Northants NN16 8UN.

TRAFFIC

BULLETIN

VOL. 22 NO. 3 MARCH 2010

CONTENTS

news

93

- editorial • technology to age ivory • new UK legislation • Saving Plants that Save Lives and Livelihoods
- Alerce • biodiversity indicators • bushmeat monitoring system • lemurs hunted for bushmeat • trade in Clouded Monitors



feature

105

Application of food balance sheets to assess the scale of the bushmeat trade in Central Africa

S. Ziegler



feature

117

Dried or fried: amphibians in local and regional food markets in West Africa

M. Mohneke, A.B. Onadeko, M. Hirschfeld and M.-O. Rödel



seizures and prosecutions

129

A round-up of recent seizures and prosecutions that have taken place around the world



short communication

141

The status of the retail ivory trade in Addis Ababa in 2009

E. Martin and L. Vigne



It is ironic that as we enter another Year of the Tiger, Tiger populations in the wild have plummeted from as many as 100 000 to a mere 3200 over the past 100 years. Despite our best efforts, we continue to lose wild Tigers to poaching for the illegal trade, habitat loss, increased conflict between Tigers and people, and intense over-hunting of their prey species.

EDITORIAL

Over the years, there has been a huge amount of conservation effort and millions of dollars in resources invested in saving wild Tigers. But forests that Tigers inhabit are still full of snares; criminals kill and smuggle Tiger parts at will; and Tiger parts are still openly displayed for sale all over Asia. Why has this been allowed to continue? Why are we not boasting healthy, thriving populations throughout Asia? Why are the efforts of national governments and the international community failing?

Certainly, part of the problem is that resources put into on-the-ground Tiger conservation are either inadequate, or are not being channelled where they are needed the most. Those on the frontline of law enforcement regularly deal with age-old inadequacies, ranging from a lack of equipment to insufficient capacity. Enforcement officers in key trade hubs use taxis or buses to carry out their investigations and raids, often unarmed, while the poaching syndicates they hope to eliminate move freely in powerful four-wheel drive off-road vehicles, using the latest satellite navigation technology and packing high-powered automatic weapons.

At the very root of these practical problems is insufficient political will to provide the capacity to implement and enforce adequately the relevant national laws and international measures governing illegal Tiger trade, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Those authorities whose commitment and action matters most are frequently disengaged from and even in denial about the plight of the Tiger—mainly because their political masters are indifferent as well.

Fortunately, recent developments have shown that there could be light at the end of the tunnel. A new international initiative, the Global Tiger Initiative, led by the World Bank, has injected fresh impetus, momentum and new opportunities to foster increased international co-operation and co-ordinated action. The initiative hopes to sound the alarm to the highest level of decision-makers, culminating in an International Tiger Summit of Heads of State at Vladivostok, Russia, later this year.

The Global Tiger Forum (GTF)—the world's only inter-governmental organization dedicated solely to Tiger conservation—is in the process of being revitalized and has added a new sense of urgency to its work, plotting a fresh course for Tiger conservation efforts range-wide.

Other new partnerships are taking place, particularly in the area of law enforcement co-operation. Today's illegal trade in Tigers could be markedly reduced, if concerted efforts were made by everyone in the law enforcement community. For this reason, CITES is forging stronger linkages with other enforcement organizations such as INTERPOL, the World Customs Organization and United Office on Drugs and Crime. Bilateral efforts, such as the India-China protocol on Tiger conservation, and regional enforcement initiatives such as ASEAN-WEN and the South Asia wildlife enforcement network are taking the fight against poachers and illegal traders across borders and national boundaries.

These efforts are indeed encouraging but they will amount to nothing unless they are translated into effective enforcement efforts on the ground. Given the challenges already being faced by the enforcement front line today, the rapidly rising rate of poaching and the downward spiral of Tiger numbers in the wild, ground-level enforcement action must be the highest priority.

At the same time, a new complication is arising that could undermine these actions. Commercial farms for Tigers are being proposed by some parties as a potential conservation solution. However, commercial farming of other wildlife in Asia, such as Asiatic Black Bears in China, crocodiles in Thailand, or Yellow-crested Cockatoos in Indonesia, has done little, if anything, to protect the species in the wild. Unless Tigers are effectively protected in their habitat and illegal markets are shut down, illegal killing and trade of Tigers will continue. Commercial Tiger farms may simply make the situation worse, stimulating demand for Tiger parts and confusing enforcement efforts. With poaching of wild Tigers a much cheaper option than rearing animals in captivity, and good evidence of a market preference for wild-sourced Tiger products, this would undoubtedly lead to an escalation of poaching in the wild, spelling disaster for wild Tigers.

Will there be Tigers in twelve years from now, when we enter the next year of the Tiger, or will the Tiger have become a creature of myth, like the lunar calendar's Dragon? It is not too late—Tiger populations can rebound if the pressures are removed. Adequate habitat still exists and prey populations can recover quickly if given the chance. But serious protection and enforcement is essential, and resources are needed more than ever to be spent accountably and efficiently, with an urgent need for better support for enforcement personnel. And most importantly, support from those with the power to effect real change, and to save Tigers from extinction in the wild, is imperative, now more than ever.

*Chris R. Shepherd, Senior Programme Officer,
TRAFFIC Southeast Asia*

VICKI CROOK has been appointed as Programme Officer with TRAFFIC Europe, based in Cambridge, effective August 2009. Vicki joined TRAFFIC from the Royal Botanic Gardens, Kew, where she worked on the Millennium Seed Bank Project and the Sample Red List Index.

JILL HEPP left her position as Program Officer at TRAFFIC North America in October 2009 after a period of four years to join the Pew Environment Group where she will work on Pew's Global Shark Conservation Campaign. From March 2010, the post has been filled by **VALERIE CRAIG**, who worked previously for SeaWeb on the Seafood Choices Alliance since 2006.

bulletin board

LISA KELLEY, Communications Officer with TRAFFIC Southeast Asia's Greater Mekong Programme, left in August 2009. **SARAH MORGAN** has been appointed her replacement.

THOMAS OSBORN was formally appointed to the post of Co-ordinator of TRAFFIC Southeast Asia's Greater Mekong Programme in June 2009 after a period acting in this position on an interim basis. Prior to this, Tom had worked as TRAFFIC's Viet Nam Forest Trade Officer.

DOROTTYA PAPP left TRAFFIC in September 2009 after a period of five years at TRAFFIC's Central Eastern Europe Project Office based in Hungary.

WILLIAM SCHAEDELA began work in March 2010 as the new Regional Director of TRAFFIC Southeast Asia. Bill joins TRAFFIC from WWF Greater Mekong Programme, where he was Country Director for Thailand.

PAULINE VERHEIJ has been appointed Tiger Trade Programme Manager, based at TRAFFIC's office in Kuala Lumpur, Malaysia, effective 1 December 2009. The position will be jointly managed between TRAFFIC International and WWF International's Tiger Network Initiative. Key priorities for the start-up phase of Pauline's work encompass the further development and co-ordination of the plan of action for trade within the Tiger NI, and the respective Tiger-related work of the TRAFFIC network.

t r a f f i c

w e b s i t e s

www.traffic.org (English)
www.wwf.ru/traffic (Russian)
www.wwf.org.mx/wwfmex/prog_traffic.php (Spanish)
www.wwfchina.org/traffic (Chinese)
www.wow.org.tw (Chinese)
www.trafficj.org (Japanese)

Videos: www.youtube.com/trafficnetwork

The TRAFFIC Bulletin is available on www.traffic.org



ANITA SANCHO

Our colleague and dear friend Anita Sancho passed away after a tragic accident on 7 October 2009. Her

loss is deeply felt by all who knew her, though we have taken strength from remembering her as she was: a committed conservationist and biologist, a wonderful mother and wife, and a happy, enthusiastic and warm friend.

Anita was Research Officer at TRAFFIC South America from 1998–2004, where she was in charge of marine wildlife trade issues: trade in sea cucumbers, Patagonian Toothfish and sharks were just some of the subjects she worked on with great dedication and passion.

Anita left TRAFFIC to take up the challenge of co-ordinating the GEF-UNDP project "Galapagos Invasive Species". Her efforts in this role were widely recognized and led to the establishment of the First World Fund against Invasive Species. Concern about the impact of invasive species was the main reason that the Galapagos Islands were declared by the Ecuadorian president Rafael Correa in 2007 to be "at risk".

For her conservation work in the Galapagos Islands Anita received the Woman of the Year award in 2008.

Most recently she was working at the National Secretariat of Risk Management (Secretaría Nacional de Gestión de Riesgos) leading the project SAT, an early alert system to control risks in case of eruption of the Tungurahua and Cotopaxi volcanoes ("Sistema de alerta temprana de control de riesgos para alertar en caso de erupción de volcán Tungurahua y Cotopaxi").

The memory of Anita will remain with us and she will always be remembered for her professionalism and dedication, and with gratitude for the great time she shared with us. Her passion for life allowed her to achieve so many of her dreams.

Bernardo Ortiz,

Director, TRAFFIC South America

Ground-breaking Forensic Technique Employed to Age Ivory

In 2007, Hampshire police, acting on information provided by the UK National Wildlife Crime Unit, carried out a warrant at the house of a person who was suspected of trading illegally in elephant ivory on eBay. A number of items were removed from the house which were subsequently confirmed by the Natural History Museum to be elephant ivory, at least some of which were thought to be of recent origin. Trade in elephant ivory that is worked and over a certain age (pre-1947) can be traded legally within the EU without the need for any certificates. However, trade to countries outside the EU can only be legal if the correct permits have been acquired. The owner of the ivory claimed to believe all the items in question were antique ivory so had no reason to think any offence was being committed.

In order to determine scientifically the age of the ivory, samples were passed to the Scottish Universities Environmental Research Centre for radiocarbon dating. This test is usually used to date archaeological finds or rocks and is based on the radioactive decay of the carbon-14 isotope. The costs of this test were partially covered by the Forensics Analysis Fund. The analysis proved conclusively that the elephants from which a number of the pieces had originated were still alive in the 1950s. On

this basis, charges were brought against the suspect who appeared in court in 2008. However the defendant was acquitted by the jury, who believed the person's claim to have not realised the ivory was not antique and that the law had been violated.

Despite the disappointing result for law enforcement, the acceptance by the court of the radiocarbon dating evidence was a positive development.

Radiocarbon is a radioactive type of carbon formed from nitrogen in the upper atmosphere. It is taken up as carbon dioxide during photosynthesis, entering the food chain and every organism. Radiocarbon has a fixed rate of decay back to nitrogen. By measuring levels of radiocarbon in organisms and their parts, it is possible to estimate the time elapsed since death. From the early 1950s, nuclear weapons-testing increased atmospheric radiocarbon. Any organism with a radiocarbon level higher than the natural level must therefore have been alive after the early 1950s.

Enforcers believe this technique can be used successfully in the ageing of many other wildlife products in illegal trade, such as Tiger body parts, rhinoceros horns or scrimshaw (engravings on the bones and teeth of various marine mammals), and could prove to be an effective enforcement tool.

Stephanie Pendry, Enforcement Programme Leader, TRAFFIC

Amendment to UK Legislation Implementing CITES

Under EC Regulations there is an obligation on Member States to introduce comprehensive national legislation to enforce the Regulation's requirements. The *Control of Trade in Endangered Species (Enforcement) Regulations 1997* (COTES) allows the provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to be enforced in the UK in accordance with relevant EC regulations.

On 11 August 2009, *The Control of Trade in Endangered Species (Enforcement) (Amendment) Regulations 2009* was amended to clarify how a prosecution should be brought in relation to commercial trade in "split-listed" CITES species. Split listing occurs where a species or family is divided between different Annexes of the EU Wildlife Trade Regulations which implement CITES across the European Community. This Regulation is only concerned with split listings which occur between Annexes A and B. Endangered species afforded protection by CITES are listed in one of four Annexes (Annexes A to D) to the Principal Regulation. Species are allocated to the appropriate Annex according to their biological status and the impact that international trade may have on their conservation status. Annex A contains species threatened with extinction and commercial trade is generally prohibited. Annex B contains species that are not necessarily threatened with extinction now but may become so unless trade is closely monitored.

The regulation has been amended by adding a presumption to COTES offences controlling the commercial use of specimens of endangered species so that, where it is not reasonably practicable to identify whether a specimen of a split-listed species belongs to Annex A or B, it is presumed to derive from an Annex A species. This instrument closes a legal loophole highlighted during a recent failed prosecution of a trader who offered for sale traditional Chinese medicines claiming to contain species that were listed in both Annex A and B—or split-listed species. It is not always possible to determine whether a particular split-listed specimen derives from a species (or subspecies or geographical population) listed in Annex A or one listed in Annex B. In this court case, it was impossible to prove the Annex from which the specimens derived.

<http://www.defra.gov.uk/wildlife-pets/wildlife/trade-crime/cites/action-uk.htm#amendcotes>; Pendry, S., Inskipp, C. and Allan, C. (2009). *Wildlife Trade Law: a UK Enforcer's Factfile Version II 2009*. TRAFFIC International, Cambridge, UK.

Application of ISSC-MAP for Cambodian Plants

A two-year project being piloted in Cambodia by TRAFFIC Southeast Asia on the sustainable management of medicinal and aromatic plants has come to a successful close this year. The pilot was part of the “Saving Plants that Save Lives and Livelihoods” project, designed to test a recently developed International Standard for the Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) for species important to local health and economies around the world. Cambodia’s particular success offers insights into the feasibility of a global standard for sustainable medicinal and aromatic plant (MAP) management and provides direction for future courses of action.

Background

“Saving Plants that Save Lives and Livelihoods” is a global project which aims to conserve MAPs and their habitats and to establish sustainable-use schemes, including benefit-sharing within local communities. The ISSC-MAP standard was developed between 2004 and 2007 by WWF, IUCN, TRAFFIC and BfN to provide a tool to achieve this conservation target. The rationale for developing this project was to put the ISSC-MAP into practice in selected regions worldwide to develop efficient conservation mechanisms for selected MAP resources and their habitats which are under threat or likely to become threatened.

In Cambodia, the reliance of many people on traditional medicines highlighted the need for the application of a standard such as ISSC-MAP to conserve resources and improve livelihoods. Nearly 40% of plants in Cambodia are medicinal and aromatic plant species used in healthcare, subsistent livelihoods and commercial trade. Generally, the highly valued species in local and international markets face exhaustive collection, resulting in population scarcity, which impacts local livelihoods, traditional knowledge and biodiversity. Like plant species in many countries around the world, many MAP species in Cambodia are now threatened, mainly due to over-harvest/unsustainable collection and poor management of natural resource areas.

Methodology

To apply the ISSC-MAP standard in Cambodia, a suitable location and MAP species with high potential market value were first selected. During the first project workshop, stakeholders from local communities, traders, research organizations, NGOs, government, universities, and others, discussed and selected a location and MAP species based on data from field observations and local interviews. The Prek Tnoat Community Protected Area (CPA) was chosen as the site for ISSC-MAP implementation for two MAP species: Krakao *Amomum ovoideum*, a plant whose fruits are medicinally used for respiratory and

digestive health, and Tepirou *Cinnamomum cambodianum*, a rare tree whose bark is also used for digestive health.

A detailed resource assessment was conducted by biologists and members of the Prek Tnoat CPA to measure vegetation type and structure, species ecology, population density and yield production. In addition, a market chain survey was conducted in Phnom Penh to determine market viability of Krakao and Tepirou. Results of these studies found that the Tepirou tree was not a good candidate for the management programme: bark collection of this species can only happen on a five-year rotation and the current population size is too small to provide enough potential income for the Prek Tnoat community, and incorrect harvesting would threaten the species with extirpation. However, the management plan put in place a methodology for sustainable harvesting so that, while income generation is small, over-exploitation can be avoided. The resource assessment also provided the basic information necessary to create a community-based MAP management plan covering three main areas: 1) managerial structure, role and responsibility; 2) regulation of collection; and 3) benefit sharing. This MAP management plan was drafted by a team of various stakeholders and integrated into the annual CPA management plan.

Lessons learned

A key objective of the project was to ensure the continued success of ISSC-MAP implementation following completion of the pilot project. At each step in the process, efforts were made to empower and build capacity among the various stakeholders in order to retain long-term sustainable MAP management in Prek Tnoat. Members of the local community were trained to conduct their own resource assessments, monitor MAP harvest and survival, properly collect and process the MAP species, and participate in access and benefit-sharing. Leaders of the project also produced and distributed a leaflet in Khmer on sustainable harvest and processing techniques of Krakao to produce quality fruits with high market value.

During the final stakeholder meeting, a number of strategies for benefit sharing among the community were put forward. One suggestion was to allocate a small portion of earnings to a community fund that would support schools and other shared resources, and/or to a commune fund for larger infrastructure development and improving relations within the commune. The remaining funds would go to the collectors, processors, and traders directly involved in MAP management. Another suggestion was to charge community members a discounted price for the traditional medicines made from Krakao, as a means of sharing benefits and garnering support for sustainable MAP management.

One challenge to the implementation of ISSC-MAP in Prek Tnoat was that only a select few MAPs are valued in national and/or international markets. A potential solution was to add value to the raw Krakao material by processing and packaging it on site into traditional medicine that commands a higher price. To this end, the

stakeholders have initiated a community-based Traditional Medicine Producer Group charged with producing medicines from sustainably harvested resources. Another obstacle was that Prek Tnoat does not have a direct market link to Phnom Penh. MAP sellers were forced to transport Krakao to Phnom Penh and often complained of being stopped and taxed by authorities along the way.

The seasonal availability of Krakao means that Prek Tnoat will need to expand their MAP management to include other species such as *Smilax glabra*. The best strategy for increasing income for the community without over-harvesting Krakao will be to harvest multiple MAP species throughout the year. In order to meet market demand for popular MAP species and avoid local extirpation, collectors will have to expand collection to other communes and sites. Future management will also need to establish technical standards on issues such as names of MAPs (Krakao is just one of many common names), processing techniques and community benefit sharing.

Other significant challenges are the current limited capacity and lack of resources (e.g. drying kilns) for MAP management at the local community level, and the limited policy support for sustainable collection at the national level.

ISSC-MAP application in Prek Tnoat will take some time to develop and implement fully. However, the interest in and support of ISSC-MAP standards by the many stakeholders is encouraging for the future success of the project. In addition, the emphasis on capacity building over the past year will hopefully ensure long-term sustainability of the project in Prek Tnoat and possible expansion into other sites. The experience at Prek Tnoat should be taken as a model for similar conservation efforts around the world.

“Saving Plants that Save Lives and Livelihoods” is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), and implemented by TRAFFIC, WWF and the IUCN Medicinal Plants Specialist Group in India, Nepal, Brazil, South Africa/Lesotho and Cambodia.

Sarah Morgan, Greater Mekong Programme Office, TRAFFIC



PEELING BARK OF TEPIROU *CINNAMOMUM CAMBODIANUM*. THIS SPECIES WAS FOUND NOT TO BE A SUITABLE CANDIDATE FOR THE MANAGEMENT PROGRAMME ALTHOUGH A METHODOLOGY FOR SUSTAINABLE HARVESTING WAS IMPLEMENTED SO THAT OVER-EXPLOITATION CAN BE AVOIDED.



MAPPING EXERCISE WITH MEMBERS OF THE PREK TNOAT CPA. THIS EXERCISE WAS CONDUCTED AS PART OF THE RESOURCE ASSESSMENTS FOR THE SELECTED SPECIES.

WORKSHOP ON BUSINESS'S ROLE IN PROTECTING VIET NAM'S WILDLIFE

In early December 2009, the TRAFFIC Greater Mekong Programme hosted a workshop for the business community on wildlife trade in conjunction with the Communist Party's Central Committee for Communications and Education (CCCE) and the Viet Nam Chamber of Commerce and Industry. The workshop, entitled “Corporate social responsibility for the protection of wildlife, the conservation of natural resources and the sustainable development of Viet Nam” was the first of its kind, bringing together government and business to raise awareness of unsustainable and illegal wildlife consumption and to discuss conservation strategies. Over 90 participants from State-owned companies, private enterprises and governmental advisory bodies attended the two-day meeting, held in the town of Tam Dao in northern Viet Nam. Presentations and open group discussions focused on integrating commerce, policy and wildlife protection.

The workshop was conducted as part of a WWF- and TRAFFIC-led Wildlife Trade Campaign to change consumer attitudes and behaviour regarding the consumption of wildlife. Following the results of a 2005 TRAFFIC survey, which found that business and government officials are the two largest consumers of wildlife in the Vietnamese capital of Ha Noi, workshops have been targeting these specific groups. A previous conference was held in August to raise awareness among high level State and Communist Party officials and led to a successful partnership between TRAFFIC and the CCCE. Such collaboration will be crucial for future campaign success and to promote sustainable wildlife trade and the conservation of natural resources in Viet Nam.

Sarah Morgan, Greater Mekong Programme Office, TRAFFIC

Saving Plants that Save Lives and Livelihoods

Experiences from Brazil: The Importance of Access and Benefit-sharing and Traditional Knowledge, and the Challenges between Community and Business Links.

AVIVE (Associação Vida Verde da Amazônia) is a women's association established in Silves, Brazil, in 1999, with the aim of developing natural products from the sustainable, wild collection of native medicinal and aromatic plants. The group subsequently set up a co-operative, COPRONAT, to sell the finished products, which are mainly obtained from collectors and producers from different communities. In some cases, Traditional Knowledge is associated with the access and use of such species. AVIVE has established a relationship with government, NGOs, academic and private sectors for different activities related to their work.

Although there is a lack of clarity regarding the scope of Access and Benefit Sharing (ABS) regulations in relation to the use of biological resources, good ABS practices as well as those relating to protection, recognition and compensation of Traditional Knowledge, are key for the commercialization of medicinal and aromatic plants and to avoid misperceptions of bio-piracy or misappropriation of activities towards promoting their sustainable use and trade.

In Brazil, the Council for the Management of Genetic Patrimony (CGEN-MMA) is the authority responsible for ABS matters. Provisional Measure No. 2.186-16 (2001) regulates access to genetic resources, access to and protection of associated Traditional Knowledge, benefit-sharing and technology access and transfer. Customary rights of local communities and indigenous peoples are guaranteed both in the Brazilian Constitution (Art. 225) and by the Indian Statute (Law No. 6.001/1073). Traditional Knowledge and ABS are also recognized and promoted by other national policies related to medicinal and aromatic plants and sustainable development.

Besides the poor awareness within different sectors of the need to enter into ABS agreements for Traditional Knowledge, the greatest challenges relate to a range of complex issues, e.g.:

- determining ownership, especially where there are several populations with common knowledge;
- the kind of agreements and consultation processes that should be developed;
- who provides "Prior Informed Consent" and decides who should receive/share benefits;
- the Convention on Biological Diversity (CBD) has not established negotiation principles between sub-parties within the countries but only among parties;
- Intellectual Property Rights: Traditional Knowledge is not patentable because it is not considered an innovative technology. Nonetheless, in Brazil, it can be registered in the Livro dos Saberes (Knowledge book), according to Ministerial Decree No. 3.551/2000. However, this Register is not considered enough to provide protection as it does not restrict the granting of intellectual property rights, just recognition and documentation on cultural manifestations.

Each case is different and deserves to be analysed in order to reach a balance between compliance with local, national and international regulations, as well as fair negotiations of benefits for all parties involved. The challenge to implement ABS and Traditional Knowledge-related provisions remain not only for the communities but for other sectors.

Different sectors need to increase their knowledge of these issues and their importance. Experts recommend that each user obtains clear information from each institute before beginning access, use and trade activities. But it is not that simple. AVIVE as collector, producer, supplier and trader, will have to learn how

to negotiate with different interested parties, following current guidance and models and take appropriate legal and technical advice.

"Saving Plants that Save Lives and Livelihoods" is a project undertaken by TRAFFIC, WWF and IUCN, financed by BMZ and implemented in Brazil by the IUCN Regional Office for South America and AVIVE. One specific recommendation from the project has been for AVIVE to develop its own policy to deal with these issues and to protect its Traditional Knowledge. The same recommendations are applicable for other parties involved. The role of those implementing the project is to facilitate available information and provide expertise and advice on these issues.

Ximena Buitrón, Senior Program Officer, Innovation, Sustainable Business and Biodiversity, IUCN Regional Office for South America

Alerce Ruling

A ruling in Chile prompted by the illegal trading in *Alerce Fitzroya cupressoides* (CITES Appendix I) timber means that the process by which an individual gets or changes legal title to a piece of private land will be completely opened up for public scrutiny.

The new ruling, effective from 23 January 2010, obliges the Ministry of Public Properties to provide online all executive resolutions regarding the title-granting process throughout the country. This ruling is the direct result of a July 2009 lawsuit filed before Chile's Transparency Council (CPLT) by environmental attorney Miguel Fredes, who charged that the State violated Chile's newly passed Transparency Law (20.285) in the way it carried out its land title operations. Fredes had for years been unsuccessful in trying to ascertain ownership rights to highly valuable Region X Alerce forests owned by his client Forestal Sarao. Prior to the new ruling by the CPLT, the process by which the State granted or changed title to a landowner had been completely shrouded in secrecy.

The felling of Alerce, one of the world's oldest and rarest trees, endemic to Chile and Argentina, has been prohibited in Chile since 1976; however, in 1987 Chile passed a law that allowed Conaf, the State's forestry agency, to issue permits for the logging of Alerce trees that had died before 1976. This loophole encouraged a black market in Alerce, with traders often stripping off Alerce bark or starting forest fires to kill the trees.

Fredes's client, Forestal Sarao, claimed ownership of Alerce forests that were being burned and logged near the Region X town of Fresia by people who appeared to have a legal claim to his land, but who did not, in fact, own it. However, he had no way of determining how his ownership rights were being taken away from him because of the opaque proceedings of the National Properties Ministry which enabled government officials to argue that information in all land title matters belonged only to those seeking the land title changes, or that access should be denied because the title was "being processed" or had already been archived. In fact, the relevant files sought by Fredes were often in the possession of those who were making false ownership claims, making it all the more difficult for the attorney to learn exactly what was happening in the case. This also led to the strong suspicion that major political players were involved, using their influence within the regional ministry offices for political payoff purposes. Because of the secrecy of the process, legitimate landowners only learned that they were being deprived of their property after the fact, and only if they were attentive to the small print notices published by the local media.

www.santiagotimes.cl/index.php?option=com_content&view=article&id=18152:alerce-case-chiles-transparency-council-shines-light-on-states-land-title-process&catid=44:environmental&Itemid=40

BIODIVERSITY INDICATORS

The Biodiversity for Food and Medicine Indicator has been developed by TRAFFIC in collaboration with the IUCN-SSC Medicinal Plant Specialist Group through the Biodiversity Indicators Partnership (BIP), with assistance from the IUCN Species Programme and BirdLife International. At present, the indicator provides a measure of change over time in the conservation status of animals used for food and medicine, and a baseline for the conservation status of medicinal plants. Plants harvested for food have not been included; apart from medicinal use, collection of data on harvest for other purposes is not as advanced as for terrestrial animals.

The current food and medicine indicator is based on data from *The IUCN Red List of Threatened Species*. An IUCN Red List Index (RLI) for birds, mammals and amphibians used for food and medicine has been produced. This uses data from repeated assessments of the status of each species for the *IUCN Red List*, and illustrates overall trends in the extinction risk over time.

Indicator scale

This indicator provides a global picture of the changing status of bird, mammal, and amphibian species used for food or medicine. These data can be disaggregated to show regional patterns of use and trends in species extinction risks.

Indicator presentation

Draft Red List Indices showing the proportion of species expected to remain extant in the near future without additional conservation action for all species, species used for food and/or medicine or not used for these purposes for: a) birds b) mammals, and c) amphibians.

Interpreting the indicator

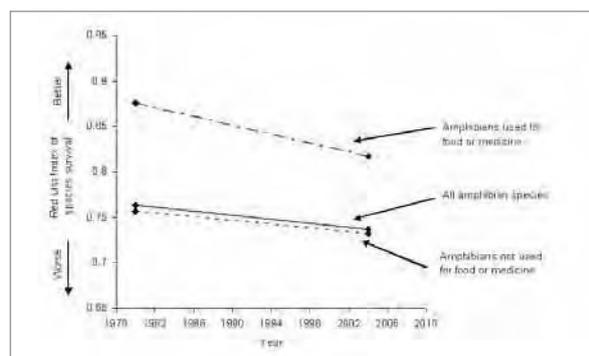
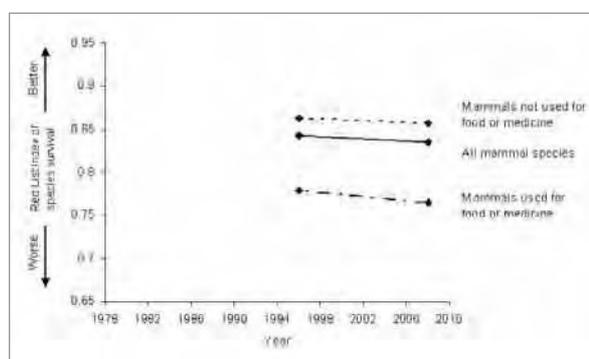
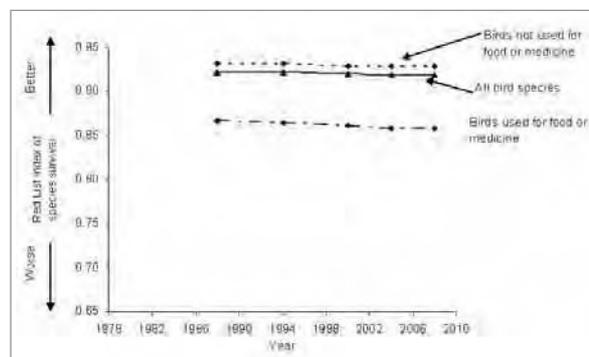
The RLI measures trends in the overall extinction risk of species-groups, as an indicator of trends in the status of biodiversity. Decreasing RLI values (a downwards sloping line) means the expected rate of extinctions (i.e. biodiversity loss) is increasing. The RLIs for birds and mammals indicate those species used for food and medicine are more threatened than those that are not, and their conservation status is also deteriorating at a greater rate. In contrast, amphibians used for food and medicine appear overall to be less threatened, but with a more rapidly declining conservation status, than those not used for these purposes.

Future development

Further development of this indicator will explore the relationship between trends in conservation status of selected species, commodity prices and people's ability to access wild animal and plant products in a selection of countries where these contribute substantially to food and medicine.

Thomasina Oldfield,
Research and Analysis Programme Leader, TRAFFIC

Draft Red List Indices showing the proportion of species expected to remain extant in the near future without additional conservation action for all species, species used for food and/or medicine or not used for these purposes for: a) birds b) mammals, and c) amphibians.



Source: RLIs produced using IUCN Red List data with assistance from IUCN Species Programme and BirdLife International.

2010 Biodiversity Indicators Partnership (BIP)
website: <http://www.twentyten.net>



The Food and Medicine Indicator forms part of the 2010 Biodiversity Indicators Partnership. The 2010 Biodiversity Indicators Partnership is a global initiative to track progress towards achieving the "2010 biodiversity target" to reduce significantly the rate of biodiversity loss by 2010. The Partnership brings together a host of international organizations working on indicator development, to provide the best available information on biodiversity trends to the global community and assess progress towards the CBD 2010 target. The 2010 BIP has been established with major support from the Global Environment Facility (GEF). Development of the Food and Medicine Indicators has been supported by funds from GEF and SwedBio.

On the Need for a Bushmeat Harvest and Trade Monitoring System in Central Africa

Several studies have documented wild meat (commonly termed bushmeat in Central Africa) as the main source of dietary protein and one of the most important sources of income for rural people in Central Africa, where up to five million tonnes are harvested annually (Fa *et al.*, 2002). There is evidence that the scale of hunting in Central Africa poses a threat to many tropical forest species. However, the long-term persistence of the bushmeat trade, documented in Africa over several centuries, suggests that the trade can be sustainable for resilient species (Nasi *et al.*, 2008). Besides the methodological challenges associated with measuring ecological sustainability, there is an increased recognition that the notion of sustainability in the context of bushmeat trade should include sociological and economic dimensions, as recommended by the Liaison Group on Bushmeat of the Convention on Biological Diversity (CBD), 2009.

In this context, the Central Africa bushmeat “issue” has in the last decades largely been documented through publications of an increasing number of projects and programmes that aim at understanding, assessing, and quantifying bushmeat consumption, hunting and trade and sometimes also at tackling wild meat hunting and trade where overexploitation or illegal practices take place.

Numerous governmental, inter-governmental and non-governmental bodies are involved in such projects, and are shedding light on the bushmeat “issue” from very different angles, including in sectors relating to development, applied science, food, conservation and health.

However, the ecological, social, economic and health implications of the bushmeat harvest and trade are still debated. Though often termed a “bushmeat crisis”, a detailed look may provide a complex picture: is it a biodiversity decline crisis with an empty forest syndrome, a food or development crisis for rural communities, or in some instances, does this “crisis” mean health risks for consumers, or a combination of any of the above?

Although plenty of projects and detailed research exist, both a full picture of bushmeat issues in Central Africa and a comprehensive analysis of the lessons learned throughout these projects at national or regional level, are currently lacking. Such a knowledge gap neither helps to identify what the “crisis” is, nor when it has occurred. More important, how would policy decision-makers in Central Africa know what remedial action is needed to tackle any crisis? Yet, at least two guiding governing frameworks, e.g. the CBD and its report of the Liaison Group on Bushmeat (2009), and the operational document relating to the Central African

Forest Commission’s (COMIFAC) Convergence Plan (2009) stand as examples of such demands upon decision-makers. Answers to these questions are all the more crucial because Government decision-makers and intergovernmental fora still lack unbiased and fact-based information that support their decisions within the fields of development, conservation, health, food and science.

This, in turn, is a call for key stakeholders to collaborate on providing an overview through indicators on the bushmeat use and trade “issue”. In 2008, TRAFFIC launched and continues to support a process of development of a Central African Bushmeat Monitoring System through a participatory approach, including representatives of national institutions, scientific and technical institutions or organizations, NGOs and the private sector. In particular, TRAFFIC organized two workshops in Douala, Cameroon, in December 2008, and February 2010, respectively (TRAFFIC, 2008, 2009) which aimed to develop, in collaboration with selected key stakeholders, a monitoring system which could be based on available aggregated survey information, providing a regular overview through proxy indicators. Very informative and constructive discussions were held about the aim and scope of the monitoring system “système de suivi de la filière viande de brousse en Afrique centrale” (SYVBAC), its potential structure and function, methodological aspects, challenges of data collection and site selection, identification of indicators, but also about partnerships and advocacy issues. Discussions and information-sharing underlined the strong interest and support of participants to contribute to the development of SYVBAC.

TRAFFIC hopes that ultimately SYVBAC will help decision-makers to have relevant and much needed data on bushmeat harvest, use, and trade to hand. Government decision-makers will become increasingly better informed, primarily to meet national policy and development needs, but also in a better position to respond to various requests for input to the international fora and conventions (CBD, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), International Tropical Timber Organization (ITTO), among others), regional bodies (COMIFAC, Congo Basin Forest Partnership (CBFP), for example), and at national level (National Bushmeat Action Plans and respective strategies, legislation and Forest Management Plans). More generally, this initiative would contribute to the development of the Observatoire des Forêts d’Afrique Centrale (OFAC), which strives to provide for a jointly managed overview of available knowledge and data on Central African forests in their economic, ecological and social aspects. SYVBAC may contribute to the joint knowledge-sharing undertaking of the “State of Forests” programme of OFAC (OFAC, 2009). ►

Acknowledgements

TRAFFIC acknowledges the German Ministry for Economic Cooperation and Development (BMZ), the French Development Agency/ Agence Française de Développement (AFD) and WWF Germany for their kind support for the development of a bushmeat monitoring system.

References

- CBD (2009). Report of the Liaison Group on Bushmeat, First meeting, Buenos Aires, 15–17 October 2009. www.cbd.int/doc/meetings/for/lgb-01/official/lgb-01-02-en.pdf. Viewed on 22 February 2010.
- COMIFAC Secrétariat Exécutif (2009). Opérationnalisation du plan de convergence de la COMIFAC—plan d'opérations 2009–2011. Yaoundé, Cameroon, 111 pp.
- Fa, J.E., Peres, C.A. and Meeuwig, J. (2002). Bushmeat exploitation in tropical forests: an intercontinental comparison. *Conservation Biology* 16:232–237.
- Nasi, R., Brown, D., Wilkie, D., Bennett, E., Tutin, C., van Tol, G., and Christophersen, T. (2008). Conservation and use of wildlife-based resources: the bushmeat crisis. Secretariat of the Convention on Biological Diversity (CBD), Montreal, and Center for International Forestry Research (CIFOR), Bogor. Technical Series no. 33, 50 pp.
- OFAC (2009). State of the Forest 2008. www.observatoire-comifac.net/edf/2008.php. Viewed on 22 February 2010.
- TRAFFIC (2008). Un atelier sous-régional sur un système de suivi de la viande de brousse en Afrique Centrale. www.traffic.org/news-french/2008/12/9/un-atelier-sous-regional-sur-un-systeme-de-suivi-de-la-viande.html. Viewed on 22 February 2010.
- TRAFFIC (2009). Bassin du Congo: vers un système de suivi de la filière viande de brousse. <http://www.traffic.org/news-french/2010/2/16/bassin-du-congo-vers-un-systeme-de-suivi-de-la-filiere-viande.html>. Viewed on 22 February 2010.

S. Ringuet, Central Africa Technical Programme Development Advisor
E-mail: sringuet@wwf.fr
R. Melisch, TRAFFIC Global Programme Co-ordinator
N. van Vliet, TRAFFIC Bushmeat Strategic Advisor
G. Ngandjui, Senior Programme Officer, TRAFFIC Central Africa



ED LOUIS



CI / PHOTO BY HAROLDO CASTRO

LEMURS POACHED FOR MEAT IN MADAGASCAR

Following reports in the *TRAFFIC Bulletin* (22(2):49) of the serious threat to tree species in Madagascar from illegal logging, there has been news of a massive upsurge in the illegal hunting of lemurs for meat which is threatening the survival of many species in the country, according to Conservation International (CI). The hunting is attributed to criminal gangs who are taking advantage of a breakdown in law and order after the political violence and instability in the country during 2009. Some 15 people have been arrested for the killing of these animals which are being ordered by restaurant owners, and include Crowned Lemur *Eulemur coronatus* and the Golden Crowned Sifaka *Propithecus tattersalli* (pictured above, left and right, respectively, and dried specimens, below).

CI states that the withdrawal of international support for conservation and development work following the political violence and change of government in early 2009 has weakened environmental governance and created ideal conditions for criminals to profit from the situation. The organization is working with local NGO Fanamby to call for more support from the international community to protect Madagascar's endangered wildlife. CI president Dr Russ Mittermeier, one of the world's leading authorities on lemurs, said: "What is happening to the biodiversity of Madagascar is truly appalling, and the slaughter of these delightful, gentle, and unique animals is simply unacceptable. And it is not for subsistence, but rather to serve what is certainly a "luxury" market in restaurants of larger towns in the region. More than anything else, these poachers are killing the goose that laid the golden egg, wiping out the very animals that people most want to see, and undercutting the country and especially local communities by robbing them of future ecotourism revenue.

He added: "...Madagascar has taken important steps towards resolving its political crisis and move towards the restoration of democracy. It is counter-productive of the international donor community to continue denying conservation and development funding because this only encourages poor governance of the country's natural resources. The world community must act now to support the dedicated local wildlife authorities who are battling to prevent this globally important resource from being destroyed."

Conservation International press release, 20 August 2009: <https://www.conservation.org/newsroom/press-releases/Pages/Poaching-Lemurs-Madagascar-International-Community-Must-Actnow.aspx>



FANAMBY / PHOTO BY JOEL NARIVONY

Date	Location	Items seized	Agency which made seizure	Prosecution	Source
2007	Penang	713	unknown	Court case ongoing	DWNP statistics
2007	Pahang	149	unknown	Offender fined MYR1000-1500 on two separate charges.	DWNP statistics
2007	Terengganu	2150	unknown	Charged for keeping in a cruel manner. Fined MYR1000 or 3 months gaol	DWNP statistics
2007	Terengganu	2910	unknown	As above	DWNP statistics
2007	Terengganu	2737	unknown	As above	DWNP statistics
2007	Selangor	3	unknown	Court case ongoing	DWNP statistics
2007	Kuala Lumpur	7	unknown	Investigation ongoing	DWNP statistics
2007	Kuala Lumpur	152 (287 kg of meat)	unknown	Court case ongoing	DWNP statistics
2007	Kuala Lumpur	748	unknown	Court case ongoing	DWNP statistics
2007	Johor	35	DWNP	Suspect arrested	News report
5 April 2008	Pahan	222	DWNP	No arrests made	News report
25 May 2008	Selangor	7	DWNP	Two men charged. Court case ongoing	DWNP statistics and news report
14 September 2008	Terengganu	4800	Marine Police		News report
20 October 2008	Pahang	1244	DWNP	Investigation ongoing	Perhilitan statistics
4 November 2008	Kuala Lumpur	51	DWNP	Court case ongoing	DWNP statistics and news report
7 November 2008	Segamat, Johor	7093	DWNP	Still under investigation	
4 December 2008	Johor	454	unknown	(connected to 4 Nov. case) Court case. Two people fined MYR2000	DWNP statistics and news report
11 December 2008	Kuala Lumpur	19	unknown	Investigation ongoing	DWNP statistics
11 December 2008	Kuala Lumpur	1	unknown	Investigation ongoing	DWNP statistics
16 December 2008	Negeri Sembilan	1	DWNP	Three suspects. Case ongoing	DWNP statistics
18 December 2008	KLIA Cargo Complex	676	DWNP	One man arrested	News report
11 January 2009	Kuantan, Pahang	2330	DWNP	Three men arrested.	
18 January 2009	Pahang	14	unknown	Trial ongoing	DWNP statistics and news report
7 April 2009	Selangor	1	unknown	Three charged. Court case ongoing	DWNP statistics
8 April 2009	Perlis	11	unknown	Court case ongoing	DWNP statistics
15 April 2009	Gambang, Pahang	1202	DWNP	Fine MYR3000	DWNP statistics
15 April 2009	Mencupu Orang Asli settlement, Pahang	34	DWNP	Three charged. Fined MYR3000	DWNP statistics and news report
18 April 2009	Pekan, Pahang	210	DWNP	Court case ongoing	DWNP statistics and news report
11 August 2009	Penang	1	unknown	No arrests made Court case ongoing	News report DWNP statistics

Table 1. Seizures of Clouded Monitors in Peninsular Malaysia, January 2007–August 2009.

Monitoring the Large Trade in Clouded Monitors in Peninsular Malaysia

The Clouded Monitor *Varanus nebulosus* is native to continental South-east Asia, and Java (Indonesia), and is sometimes considered a subspecies of the Bengal Monitor *V. bengalensis* (and then referred to as *V. b. nebulosus*). One of four *Varanus* species found in Peninsular Malaysia (Bennett, 1998), the Clouded Monitor is poached for meat and possibly for skins. Recent illegal trade in specimens in Malaysia has reached alarming proportions. According to the annual report of the Department of Wildlife and National Parks (DWNP), 2006 saw a worrying trend of very large quantities of these reptiles found during operations (DWNP, 2006). Seizures made by the Malaysian authorities, largely by the DWNP, exemplify the scale of the trade. Between January 2007 and August 2009, for example, some 27 975 Clouded Monitors were seized in Peninsular Malaysia.

The species is classified as Totally Protected in Peninsular Malaysia under Schedule 1 of the *Protection of Wild Life Act 1972* (Act No. 76), which is enforced by DWNP and, as such, specimens may not be killed, taken, or kept by anyone. It is also listed in CITES Appendix I and prohibited from international commercial trade.

Seizures: Figures relating to seizures of Clouded Monitors during 2007 to August 2009 were collected, compiled and analysed from a number of sources, primarily government agencies and press releases. All information compiled here has been verified by the DWNP.

The seized reptiles were discovered concealed in dealers' warehouses, cold rooms, houses, shops, as well as at airports and jetties, being transported or awaiting transport, principally, it is alleged, to China for the exotic meat market. The Clouded Monitors were more often than not seized with specimens of a variety of other species also destined for the exotic meat market, including Leopard *Panthera pardus*, Estuarine Crocodile *Crocodylus porosus*, Malayan Pangolin *Manis javanica*, Reticulated Python *Python reticulatus* (all CITES species), Wild Boar *Sus scrofa*, East Asian Porcupine *Hystrix brachyura* and various owl and eagle species (Shepherd and Shepherd, 2009), among others. The only other specimens of *Varanus* species seized during this period were 312 Water Monitors *Varanus salvator* (CITES Appendix II), which can be legally harvested and traded with the appropriate DWNP-issued licence.

Table 1 provides data relating to seizures reported in the media and DWNP's official records for the study period. The official records only include cases which were or could be brought to court and does not include those cases where compounds—or on-the-spot fines—were issued. DWNP could not provide exact dates of seizures for 2007 and agencies making the seizures other than DWNP are not always recorded.

As shown in Table 1, 2008 saw the highest number of Clouded Monitors seized in a year, within the three-year period. The state of Pahang consistently recorded high



LEE GRISMER

CLOUDED MONITOR *VARANUS NEBULOSUS*

numbers and topped the list in 2009, but Terengganu was the primary location for seizures in 2007, accounting for 81% of specimens seized that year.

Anyone found guilty of unlawfully shooting, killing or taking any species listed as Totally Protected contravenes Section 64 of the *Protection of Wild Life Act 1972* (Act No. 76), which provides for a maximum fine of MYR5000 (USD1429) or a term of imprisonment not exceeding three years, or both. Further, Section 64(2) provides for a fine of up to MYR3000 (USD857) and/or imprisonment of up to two years for those found guilty of being in possession or carrying on the business of a dealer or taxidermist of Totally Protected species. During the three-year period examined, no gaol terms were meted out in cases brought to court. Gaol terms were only required in the cases of failure to pay a fine. However, many court cases have not yet been concluded and in several, investigations are continuing. Low fines, lack of convictions resulting in prison sentences and high demand are likely the reasons behind the continuing illegal trade in this species. Without serious deterrents, the trade is likely to continue. TRAFFIC encourages the authorities in Peninsular Malaysia to continue their vigilance and for more severe penalties to be handed down to individuals found trading in these protected species.

Acknowledgements: The Department of Wildlife and National Parks (Malaysia), Loretta Ann Shepherd, and Kim Lochen are acknowledged for their assistance with this article.

References

- Bennett, D. (1998). *Monitor Lizards. Natural History, Biology and Husbandry*. Edition Chimaira (Andreas S. Brahm), Frankfurt am Main, Germany.
- Department of Wildlife and National Parks Peninsular Malaysia (2006). Annual Report, Kuala Lumpur, Malaysia.
- Department of Wildlife and National Parks Peninsular Malaysia (2007). Annual Report, Kuala Lumpur, Malaysia.
- Shepherd C.R. and Shepherd, L.A. (2009). An emerging Asian taste for owls? Enforcement agency seizes 1,236 owls and other wildlife in Malaysia. *Birding ASIA* 11:85–86.

Chris R. Shepherd, Senior Programme Officer, TRAFFIC Southeast Asia; Elizabeth John, Senior Communications Officer, TRAFFIC Southeast Asia



Some monkeys
can grip
branches
with just
their
tails

Application of Food Balance Sheets to Assess the Scale of the Bushmeat Trade in Central Africa

S. Ziegler

Wildlife is estimated to be a significant and direct source of protein for more than 34 million people living in the Congo Basin. Prevailing scientific opinion warns that the trade in bushmeat (also referred to as wild meat and game meat) represents the most immediate threat to the Congo Basin's forest mammalian biodiversity. This study attempts to assess the relationship between trends of the bushmeat trade in the Congo Basin and various variables of environmental change and socioeconomic development in Cameroon, the Republic of Congo, the Democratic Republic of Congo, Gabon and Central African Republic between 1990 and 2005. Bushmeat data were derived from food balance sheets provided by the FAOSTAT database. Despite the overall trend of decreasing forest cover in Central Africa, the FAOSTAT data lead to the conclusion that overall bushmeat extraction has increased in the Congo Basin. On the other hand, according to the same source, the gradient of bushmeat production per forest area has been on the decline in certain countries since the turn of the millennium. The results indicate that bushmeat consumption per capita is higher in countries with a larger urban population. The current trend of urbanization throughout Central Africa may trigger an increase in the per capita consumption of bushmeat. The outcome of the study also leads to the conclusion that bushmeat consumption increases significantly with personal wealth throughout the Congo Basin range States. Although the FAOSTAT bushmeat data are estimates and should therefore be regarded with caution, the data are the most readily available official sources of information on production of wild meat in the Congo Basin. In the context of rapid changes in human populations and forest exploitation that currently take place throughout much of Central Africa, this study indicates that data derived from the FAOSTAT database may be used as makeshift indicators to monitor trends of bushmeat production and consumption.

INTRODUCTION

Since the early 1990s, much research has been undertaken on the nature and scale of bushmeat exploitation and its possible impact on wildlife populations (Redford, 1992; Wilkie and Carpenter, 1999; Robinson and Bennett, 2000, 2002; Fa *et al.*, 2003). Though for decades deforestation has been cited as the most immediate threat to tropical wildlife in forest habitats, contemporary belief is that hunting is cause for greater concern. First mentioned by Redford (1992), the term "empty forest syndrome" has been introduced to acknowledge major global anxiety over commercialized hunting and the widespread prediction that large forest-dwelling species will disappear long before their habitats do. The commercial

trade in bushmeat occurs across almost all of tropical Africa, Asia and the Neotropics, but it is most prevalent in the densely forested regions of Central and West Africa (Fa *et al.*, 2003).

Most studies have voiced concerns about the scale and impact of bushmeat exploitation in the Congo Basin tropical moist forests. These forests occupy 5.3 million km², and are mainly found within six countries, namely Cameroon, the Central African Republic, the Democratic Republic of Congo, Equatorial Guinea, Gabon and the Republic of Congo (Fa *et al.*, 2003). The Congo Basin contains the world's second-largest rainforest, housing more than half of Africa's animal species (Redmond *et al.*, 2006). Bushmeat harvesting is perceived to be a threat to globally endangered wildlife. There is prevailing scientific opinion that if current trends continue, unsustainable levels of bushmeat hunting are likely to extirpate tropical forest mammalian biodiversity (Redford, 1992; Terborgh, 1999; Bennett and Robinson, 2000). Often heavy-bodied forest species with important roles in maintaining forest structure and composition are targeted (Hawthorne, 1993). Uncontrolled and illegal bushmeat hunting in this region therefore threatens the health of a forest ecosystem of planetary importance, both in terms of biodiversity and of global climate stability. In the Congo Basin, researchers estimate that up to five million tonnes of bushmeat—which is 3.4 million tonnes of dressed meat—are traded annually (Wilkie and Carpenter, 1999; Fa *et al.*, 2002). Although it is difficult to assess the magnitude of the bushmeat trade, Robinson and Bennett (2002) estimate that hunting levels in Central Africa exceed six times the sustainable rate. Primates are not excluded from the hunting regime and there is evidence that primates of international conservation value are hunted to dangerously low levels, with harvesting rates at up to 28 times the sustainable rate (Fa *et al.*, 1995). Local extinctions have been recorded in Preuss' Red Colobus *Procolobus preussi* (Waltert *et al.*, 2002), as has the extinction of Miss Waldron's Red Colobus *Procolobus badius waldroni* throughout much of its range of distribution (Whitfield, 2003).

BACKGROUND

Bushmeat, also referred to as game meat or wild meat, is the term commonly used for the flesh of forest mammals, but also the meat of some reptiles and birds (Fa *et al.*, 2003). It often provides a cheap and plentiful source of protein in regions where meat from domestic animals, such as cattle, goats and chickens, is scarce or more expensive. Bushmeat is one of those forest products which have been demonstrated to have major significance for rural communities, particularly in the humid and sub-humid tropics.

Wildlife has been hunted for food for centuries, and people have traditionally hunted game for subsistence use or for barter. Historically, in the Republic of Congo and Cameroon, bartering existed between Ba'Aka pygmies and Bantu farmers, who exchanged wild meat and agricultural products respectively (Pearce and Ammann, 1995). Matsura (2004) reports that subsistence use of



PHOTOGRAPHS: MARTIN HARVEY / WWF-CANON



HUNTER AND DEAD MONKEY, GABON (LEFT); DUIKERS KILLED BY SUBSISTENCE HUNTERS ARE DISPLAYED BY THE ROADSIDE FOR SALE TO PASSING MOTORISTS, GABON (RIGHT).

bushmeat is still important among some pygmies in Gabon. However, the past 20 years have seen the emergence of the commercial bushmeat market due to the imperative that rural people are increasingly involved in the cash economy. The sale of bushmeat allows people to purchase materials and items that a subsistence life cannot provide, as well as generating income for shelter, clothing, taxes and schooling (Ziegler *et al.*, 2002). Wildlife is estimated to play a significant and direct part in the lives of more than 34 million people living in the Congo Basin (Brown and Williams, 2003). Game meat provides protein for many poor rural families without land or access to agricultural markets. Often, there is no replacement for bushmeat, which represents 80% of all animal-based household protein consumed in much of Central Africa (Draulans and Van Krunkelsven, 2002). The current non-bushmeat protein sources in Central Africa are mainly agricultural meat, fish and seafood. Given the fact that food production in this region has not increased significantly throughout the last 40 years (Fa *et al.*, 2003), those who most depend on wildlife resources are in a dilemma: their food security is threatened due to non-sustainable levels of hunting and the absence of abundant alternative sources of protein.



ROLAND MELISCH / TRAFFIC

BLUE DUIKER *CEPHALOPHUS MONTICOLA* (LIMBE, CAMEROON, 2008), ONE OF THE SPECIES MOST COMMONLY FOUND IN THE BUSHMEAT TRADE IN CENTRAL AFRICA.

Although there is a growing body of research on hunting and bushmeat use in the African rainforest, much of the existing information is based on site-specific data, often collected over a short period of time. Comparison across studies is problematic as it is often unclear if consumption estimates are based on whole carcass, dressed, or boned-out weights. Furthermore, much of the evidence of bushmeat harvest and consumption patterns is site-specific and may lead to misinterpretation if scaled-up to the national level, as shown for deforestation by Fairhead and Leach (1998). This paper seeks to review the relationship between recent trends of bushmeat trade and various variables of environmental change and development. One of the greatest challenges associated with the management of exploitation of wildlife resources in Central Africa is the paucity of biological and socio-economic data on a national scale that would help decision-makers to assess impacts on and benefits from the bushmeat resource. The author intends to overcome this problem by reviewing bushmeat production data that are derived from food balance sheets and captured in the FAOSTAT database. The FAOSTAT bushmeat data are not calculated from market or consumption surveys but are estimates generated by FAO, which is a less than perfect source. However, for the time being, the FAOSTAT data are the most readily available official sources of information on production of game meat within the Congo Basin. An approach was applied that discusses the sustainability of the bushmeat harvest from transformed food balance data. Furthermore, the value of national bushmeat data from the FAOSTAT database was discussed to help develop policies designed to conserve wildlife and secure bushmeat-dependent livelihoods.

METHOD

This study assessed the relationship between recent bushmeat production trends in the Congo Basin and various variables of environmental change and socio-economic development. Therefore, the author was interested in defining a set of proxy variables, reflecting both the condition of the forest resource as the primary habitat of the hunted species, and the status of development and livelihoods. Table 1 provides an overview of the time series databases consulted in this review. Although all databases were updated frequently, the volume of the incoming data determines the frequency of these updates so that the most recent complete set of analysed data derives from 2005. The analysis was restricted to the period 1990 to 2005, mainly due to data constraints for years prior to 1990. It needs to be stressed that the precision of the analysis hinged upon the accuracy of the assessed databases, and particularly upon the game meat production data of the Food and Agriculture Organization of the United Nations (FAO). FAOSTAT provides data on game meat production which must not be interpreted directly as the ecological productivity of the sum of all game species within the forest ecosystem. In this paper, the term game meat production is employed as it has been used by FAO, as a measure of bushmeat harvest.

Variable	Source	Date assessed
Forest cover	http://faostat.fao.org/site/405/default.aspx	29 May 2008
Forest area per capita	http://faostat.fao.org/site/405/default.aspx http://esa.un.org/unup/index.asp?panel=1	16 June 2008
Protected areas	http://www.wdpa.org/Default.aspx	11 November 2008
Rural population	http://esa.un.org/unup/index.asp?panel=1	7 May 2008
Population density	http://esa.un.org/unpp	7 May 2008
Human Development Index	http://hdr.undp.org/en/media/hdr_20072008_en_complete.pdf	16 June 2008
Gross Domestic Product based on purchasing power parity	http://www.econstats.com/weo/V019.htm	16 June 2008
Domestic meat consumption	http://faostat.fao.org/site/569/DesktopDefault.aspx?PageID=569	29 May 2008
Production of bushmeat	http://faostat.fao.org/site/569/DesktopDefault.aspx?PageID=569	29 May 2008

Table 1. List of variables analysed in this study and sources of online databases.

Food balance sheets

The author assessed the FAOSTAT database that provides time-series and cross-sectional data relating to food and agriculture for some 200 countries. For this study, the geographical focus was on Cameroon, the Republic of Congo, the Democratic Republic of Congo, Gabon, and Central African Republic. Food balance sheets present a comprehensive picture of the pattern of a country's food supply during a specified reference period. Food balance sheets bring together the larger part of the food and agricultural data in each country to serve in the detailed examination and appraisal of the food and agricultural situation in a country. Traditionally, information on the availability of food at some aggregate level and on the structure of its distribution among households has been used for measuring and monitoring the status of food security. The food balance sheet shows for each food item—i.e. game meat in this research—the total quantity of foodstuffs produced in a country added to the total quantity imported and adjusted to any change in stocks that may have occurred since the beginning of the reference period. The FAOSTAT game meat entry is not calculated from market or consumption surveys, but production is estimated by FAO on the basis of the returned food balance sheets. FAO defines game meat production as the difference between the amount of non-bushmeat protein available and the product of the number of inhabitants, times the daily protein supply per person.

FAOSTAT time series provide game meat production data that are traditionally expressed in terms of carcass weight. To allow for comparison regarding the productivity of forest ecosystems, carcass weight was adjusted to live weight by using a conversion factor of 1.54 as described by Hill and Hawkes (1983).

The author used the live weight production data to compute bushmeat harvest per unit area and year. Since forest was considered as the primary habitat of most of the hunted game species (Haltenorth and Diller, 1992), production was defined as harvest per forest area, and subsequently discussed in terms of sustainability.

Given that the bushmeat harvested was largely destined for domestic use and that international bushmeat trade is negligible at country level, it was considered appropriate to regard the quantity supplied to the market (i.e. the harvest) as similar to the quantity demanded by the market (i.e. consumption). Thus, dividing the annual FAOSTAT production data by the number of inhabitants in the corresponding year of reference resulted in the composite variable bushmeat consumption per capita. This variable was discussed at country level and tested for statistical relationship with the variables of environmental change and socioeconomic development.

Statistical analyses

The author tested whether there is a significant linear relationship between the variables of environmental change or socioeconomic development and bushmeat consumption per capita. Regression can be interpreted as a method for accounting for some of the variation of the dependent variable in terms of variation of the independent variable (Sokal and Rohlf, 1995). Bushmeat consumption per capita was considered the dependent variable whose magnitude depends on a set of independent variables: the selected proxy variables, reflecting the condition of forest, and the status of development and livelihoods. The author calculated the mean from the time series 1990, 1995, 2000 and 2005 by country (Cameroon, the Republic of Congo, the Democratic Republic of Congo, Gabon, and Central African Republic) for all independent variables, as well as for bushmeat consumption per capita.

It should be noted that the statistical conclusions reached in this report cannot necessarily be extrapolated beyond the individual States. Moreover, it is necessary to point out that the statistical relationships between bushmeat consumption per capita and individual variables representing environmental change and economic development are not necessarily indicative of the causal drivers of the bushmeat trade, or that other factors, such as cultural and religious preferences, are irrelevant.

Country	Year	Forest cover (%)	Forest area (ha/capita)	Forest area (x1000 ha)	Protected area (%)	Rural population (%)	Population (x1000)	Pop. density (inhabitants /km ²)	GDP PPP ¹ (USD)	HDI ²	Domestic meat consumption (kg/capita/yr)	Bushmeat consumption (kg/capita/yr)
CM	1990	52.70	2.01	24 545	4.4	59.29	12 239	26	1749.5	0.529	12	3.60
CM	1995	50.40	1.67	23 445	4.4	54.67	14 058	30	1551.7	0.513	10	3.27
CM	2000	48.00	1.41	22 345	5.4	50.14	15 861	33	1849.7	0.525	11	3.03
CM	2005	45.60	1.19	21 245	7.3	45.73	17 795	37	2283.6	0.532	12 ³	2.81
<i>Mean</i>		<i>49.18</i>	<i>1.57</i>	<i>22 895</i>	<i>5.38</i>	<i>52.46</i>	<i>14 988</i>	<i>31.5</i>	<i>1858.6</i>	<i>0.525</i>	<i>11.25</i>	<i>3.18</i>
CG	1990	66.50	9.38	22 726	1.9	45.66	2 422	7	1052.5	0.559	8	4.54
CG	1995	66.30	8.11	22 641	3.3	43.57	2 793	8	1046.9	0.546	13	4.37
CG	2000	66.10	7.04	22 556	6.5	41.68	3 203	9	1144.3	0.518	9	5.00
CG	2005	65.80	6.22	22 471	12.1	39.83	3 610	11	1379.3	0.548	153	5.54
<i>Mean</i>		<i>66.18</i>	<i>7.69</i>	<i>22 599</i>	<i>6.0</i>	<i>42.69</i>	<i>3 007</i>	<i>8.8</i>	<i>1155.8</i>	<i>0.543</i>	<i>11.25</i>	<i>4.86</i>
CD	1990	62.00	3.70	140 531	5.0	72.18	37 942	16	1136.6	0.423	3	2.06
CD	1995	60.80	3.04	137 869	5.8	71.57	45 339	19	748.9	0.391	3	1.90
CD	2000	59.60	2.67	135 207	5.8	70.16	50 689	22	592.0	0.375	2	1.78
CD	2005	58.90	2.27	133 610	6.0	67.89	58 741	25	675.3	0.411	23	1.51
<i>Mean</i>		<i>60.33</i>	<i>2.92</i>	<i>136 804</i>	<i>5.7</i>	<i>70.45</i>	<i>48 178</i>	<i>20.5</i>	<i>788.2</i>	<i>0.4</i>	<i>2.5</i>	<i>1.81</i>
GA	1990	85.10	23.89	21 927	6.8	30.83	918	3	5931.4	0.525	21	20.15
GA	1995	84.90	20.72	21 877	6.8	24.62	1 056	4	6803.4	N/A	36	17.99
GA	2000	84.70	18.47	21 826	7.8	19.86	1 182	4	6612.2	N/A	37	17.77
GA	2005	84.50	16.87	21 775	19.1	16.42	1 291	5	6976.7	0.677	203	16.27
<i>Mean</i>		<i>84.80</i>	<i>19.99</i>	<i>21 851</i>	<i>10.1</i>	<i>22.93</i>	<i>1 112</i>	<i>4</i>	<i>6580.9</i>	<i>0.601</i>	<i>28.5</i>	<i>18.05</i>
RCA	1990	37.20	7.71	23 203	16.0	63.16	3 008	5	1068.4	0.398	19	3.55
RCA	1995	37.00	6.68	23 053	16.4	62.78	3 450	6	1080.7	0.390	21	3.53
RCA	2000	36.80	5.93	22 903	16.4	62.36	3 864	6	1170.1	0.394	25	3.49
RCA	2005	36.50	5.43	22 755	16.5	61.93	4 191	7	1163.0	0.384	273	3.34
<i>Mean</i>		<i>36.90</i>	<i>6.44</i>	<i>22 979</i>	<i>16.3</i>	<i>62.56</i>	<i>3 628</i>	<i>6</i>	<i>1120.6</i>	<i>0.392</i>	<i>23</i>	<i>3.45</i>

Table 2. Variables of environmental change and socioeconomic development as well as bushmeat consumption in selected countries within the Congo Basin between 1990 and 2005.
Country codes according to ISO 3166 (CM–Cameroon; CG–Republic of Congo; CD–Democratic Republic of Congo; GA – Gabon).

¹Gross Domestic Product based on purchasing power parity.

²Human Development Index.

³Data derived from 2003.

Furthermore, although the study intends to examine the extent to which bushmeat trends are associated with high levels of environmental change and economic development, it needs to be stressed that the presence of multicollinearity means that the relative contribution of different variables is difficult to isolate.

RESULTS

Environmental change and socioeconomic development

Forest cover and protected areas as well as socioeconomic data at country level are summarized in Table 2. According to the data obtained in this study, forest cover in Central Africa has declined continuously since 1990, but deforestation has varied widely in individual countries. Forest loss in absolute figures was highest in Cameroon and the Democratic Republic of Congo, where, respectively, 33 330 km² and 69 210 km², of forest were lost between 1990 and 2005. During this period, Cameroon lost 13.4% of its forest cover; the lowest rate of forest loss was observed in Gabon, where only 0.6 percent of the country's forest cover disappeared throughout the years of reference. Amongst the Congo Basin States, forest cover was highest in Gabon where more than 84% of the land area was still forested in 2005. Total area of protected zones (defined as IUCN categories I–VI and other areas, such as hunting zones) also increased from 1990 to 2005. The surface of protected areas nearly doubled in the Republic of Congo after 2000. A similar pattern was observed in Gabon where the total protected area increased by more than 140% within five years from 2000 onwards.

In 1990 the population density in the countries of concern was 11.4 inhabitants/km²; 15 years later this value had increased to 17 inhabitants/km². Population density varied among the Congo Basin range States, with the highest recorded in Cameroon (37 inhabitants/km²) and the Democratic Republic of Congo (25 inhabitants/km²) and the lowest in Gabon with five inhabitants/km² for the reference year of 2005. Forest loss in combination with population increase throughout the region meant that the forest area per capita declined in all five countries. The lowest values were in Cameroon and the Democratic Republic of Congo where, in 2005, one inhabitant had on average 40% less forest at his/her disposal as compared to 1990. In absolute numbers, one Cameroonian could theoretically claim a forest area of 1.19 hectares in 2005, whereas the corresponding value in Gabon was almost 17 hectares.

All Congo Basin countries were characterized by relatively low Human Development Indices (HDIs), and within the test sample, Central African Republic and the Democratic Republic of Congo had the lowest HDIs, Cameroon and the Republic of Congo had intermediate HDIs and Gabon had a relatively high HDI. Gabon had the highest GDP based on purchasing power parity with almost USD7000 per capita in 2005, while the Democratic Republic of Congo had the lowest (USD675.3) for this reference year. The relatively prosperous state of Gabon's economy can be attributed to its mineral oil resources.



FAMILY SELLING BUSHMEAT, KISANGANI, DEMOCRATIC REPUBLIC OF CONGO, 2009 (LEFT); BUSHMEAT, INCLUDING AN ELEPHANT TRUNK, FOR SALE AT MARKET, GABON (RIGHT).

Throughout the 1990s, a substantial proportion of countries in the tropical forest zone suffered from substantial economic stasis and decline, resulting in lower levels of governance and service provision. The domestic meat (cattle, goats, sheep, horses, rabbits, and chickens) production tables in the FAOSTAT database were also assessed. Most recent data of domestic meat consumption per capita were from 2003. Although the absolute meat production increased throughout much of Central Africa since 1990, the production increase was partly offset by population growth. Consumption of domestic meat remained more or less stagnant in Cameroon and the Democratic Republic of Congo throughout the years of reference. In Gabon, a drop in domestic meat consumption from 37 kg/capita/year in 2000 to 20 kg/capita/year in 2003 was recorded. The Republic of Congo and the Central African Republic were able to increase the annual intake of domestic meat by 87.5% and 42%, respectively.

Bushmeat production

Bushmeat production in the Congo Basin increased considerably between 1990 and 2005. Yield, as expressed in absolute figures, rose most prominently in the Democratic Republic of Congo where the FAOSTAT data show a total growth of 12 000 t, from 78 000 t/year in 1990 to 90 000 t/year in 2000 (Fig. 1). Bushmeat harvest in the Republic of Congo nearly doubled, from 11 000 t/year to 20 000 t/year throughout the reference period. A linear growth rate equal to 400 t per year characterized the bushmeat production in Cameroon.

Despite the observed trend of decreasing forest cover, the FAOSTAT production table leads to the conclusion that bushmeat production per forest area has increased throughout Central Africa since 1990 (Table 3). This boost has been most prominent in the Republic of Congo where production increased by 85%, from 74 kg/km²/year in 1990 to 137 kg/km²/year in 2005. The relative change in bushmeat production per forest area is computed in Fig. 2. Data were compared to the base year 1990 and

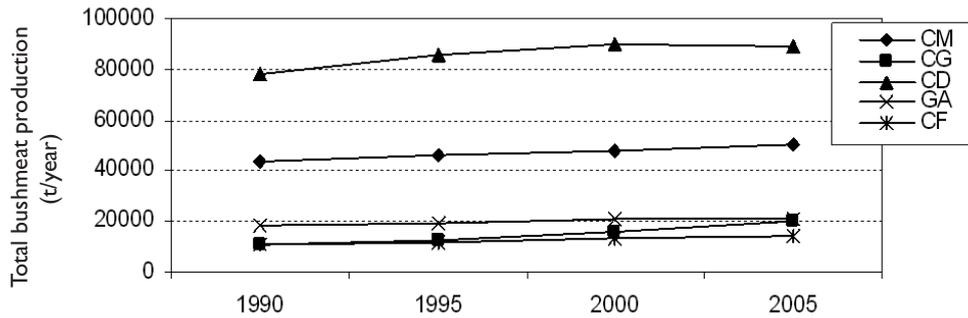


Fig. 1. Total bushmeat production in selected countries within the Congo Basin between 1990 and 2005. Country codes are according to ISO 3166 (CM–Cameroon; CG–Republic of Congo; CD–Democratic Republic of Congo; GA–Gabon; CF–Central African Republic).

the development of the bushmeat production index was plotted. The enhanced bushmeat production in the Republic of Congo after 1995 is evident. Fig. 2 also shows that the gradient of the bushmeat production index line for Central African Republic, Gabon, and the Democratic Republic of Congo, flattened to some extent after the turn of the millennium. This was most pronounced in the Democratic Republic of Congo, where the bushmeat production index even diminished by one kg/km²/year from 2000 to 2005. In the same reference period, the overall bushmeat production declined by 1265 t in the Democratic Republic of Congo.

With live weight production values between 276 and 362 kg/km²/year, Cameroon clearly outnumbered its neighbours: in any of the four reference years (1990, 1995, 2000, and 2005), bushmeat production per unit area was at least twice as high as in the Democratic Republic of Congo, Gabon, the Republic of Congo, and Central African Republic, as can be seen from Table 3.

Bushmeat consumption

According to the FAOSTAT data, consumption of bushmeat in the Congo Basin was highest in Gabon where inhabitants consumed on average more than 16 kg

of bushmeat per year between 1990 and 2005—almost four times the amount consumed in other Central African countries (Table 2). Average bushmeat consumption in all countries was 6.78 kg/capita in 1990 but fell to 5.89 kg/capita in 2005, though the difference between the means is not significant (t-test; $t = 0.21$, d.f. = 8, $p = 0.8389$). With the exception of the Republic of Congo, bushmeat consumption per capita decreased in Central Africa throughout the years of reference. This was most clear for Gabon, where the data from 2005 showed that, on average, each inhabitant consumed almost four kilogrammes less bushmeat per year compared to 1990. The trend of declining bushmeat consumption was moderate in Cameroon, the Democratic Republic of Congo and Central African Republic, with less than one kilogramme of bushmeat/year per capita throughout the reference period (1990 to 2005). In the Republic of Congo, the period from 1990 to 1995 was characterized by a drop in bushmeat consumption, but afterwards consumption per capita increased by an annual rate of 2.7 percent and achieved an annual intake of 5.54 kg/capita in 2005 (Table 2).

There is a trend that bushmeat consumption per capita is linked to forest area per capita. In countries with a higher value of forest area per inhabitant, more bushmeat

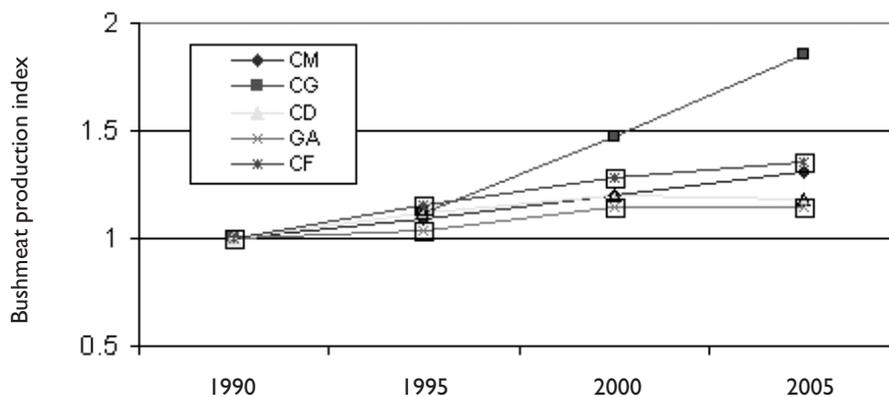


Fig. 2. Development of the bushmeat production index with 1990 as the base year for selected countries within the Congo Basin between 1990 and 2005. Country codes are according to ISO 3166 (CM–Cameroon; CG–Republic of Congo; CD–Democratic Republic of Congo; GA–Gabon; CF–Central African Republic).

Country	Year	Bushmeat production (t/yr)	Forest area (x1000 ha)	Carcass weight production (kg/km ² /yr)	Live weight production (kg/km ² /yr)
CM	1990	44 000	24 545	179	276
CM	1995	46 000	23 445	196	302
CM	2000	48 000	22 345	215	331
CM	2005	50 000	21 245	235	362
CG	1990	11 000	22 726	48	74
CG	1995	12 200	22 641	54	83
CG	2000	16 000	22 556	71	109
CG	2005	20 000	22 471	89	137
CD	1990	78 000	140 530	56	86
CD	1995	86 000	137 869	62	96
CD	2000	90 000	135 207	67	103
CD	2005	88 735	133 610	66	102
GA	1990	18 500	21 927	84	129
GA	1995	19 000	21 877	87	134
GA	2000	21 000	21 826	96	148
GA	2005	21 000	21 775	96	148
CF	1990	10 680	23 203	46	71
CF	1995	12 170	23 053	53	82
CF	2000	13 490	22 903	59	91
CF	2005	14 000	22 755	62	96

Table 3. Bushmeat production in selected countries within the Congo Basin between 1990 and 2005.

Country codes according to ISO 3166 (CM–Cameroon; CG–Republic of Congo; CD–Democratic Republic of Congo; GA–Gabon; CF–Central African Republic).

per capita was consumed and vice versa. This trend is highly significant ($R^2 = 0.9395$, $p = 0.0064$, $n = 5$) and only applies to the composite variable forest area per capita because neither forest cover nor population density alone showed statistical significance (Table 4). The regression analyses found a negative correlation ($r = -0.985$) between rural population and bushmeat consumption. Rural population refers to the number of inhabitants living in areas classified as rural according to the criteria used by each country as a percentage of the total country population. Although this statistical relationship is hampered by the small sample size ($n = 5$), it may indicate that bushmeat consumption per capita decreases with a higher proportion of the rural population.

Table 4 also indicates that bushmeat consumption increases significantly with personal wealth, expressed as GDP at purchasing power parity per capita ($R^2 = 0.9613$, $p = 0.0032$, $n = 5$). The hypothesis as to whether increasing purchasing power leads to higher domestic meat (cattle, chickens, goats) consumption was also tested, but no significant correlation was found ($R^2 = 0.5299$, $p = 0.163$, $n = 5$). No significant correlation was found for bushmeat consumption per capita and longevity, knowledge and income expressed as the composite indicator HDI. Regression analysis of bushmeat consumption and domestic meat consumption supports the null hypothesis and is therefore not significant (Table 4).

DISCUSSION

Ecological perspective

In evergreen moist forests, maximum biomass of mammal species larger than one kilogramme rarely exceeds 3000 kg/km² (Brown and Williams, 2003). The variation in mammalian biomass is mainly accounted for by the variation in ungulates whose body mass is generally less in tropical forests (Jarman, 1974).

This notably affects the amount of bushmeat that can be harvested in a forest habitat, and thus the maximum yield that can be secured by human hunters. Bushmeat production, with annual extraction rates in the Democratic Republic of Congo reaching 90 000 t/year according to FAOSTAT data, as well as the fundamentally extractive type of exploitation, raises issues of future sustainability. According to Robinson and Bennett (2000), annual sustainable harvest of game meat from tropical forests is generally under 200 kg/km² and is likely to be around 150 kg/km². If production of game meat from a forest ecosystem is about 150 kg/km²/year, and if 65% of live weight is edible meat (Hill and Hawkes, 1983), then each square kilometre of rainforest will produce 97 kg of edible meat per year.

Based on the FAOSTAT table, most annual live weight production rates in Central Africa still lie below

150 kg/km², with the exception of Cameroon where production exceeds this value by more than 100%. Furthermore, the game meat production estimates in 2005 for Gabon and the Republic of Congo are getting fairly close to Robinson and Bennett's sustainability threshold. However, it is important to note that there is no mutual agreement on average sustainable production in tropical forests. Fa *et al.* (2002) report a productivity of 1111 kg/km²/year for the Congo Basin. This shows that the range of maximum sustainable yield varies considerably and is prone to uncertainty, particularly if applied to huge areas. Therefore, any quota setting or policy decision regarding the bushmeat resource should be carried out with extreme caution. From a conservation perspective, the precautionary principle should apply and the lowest productivity should be considered (Nasi *et al.*, 2008).

There are also voices pointing out the fact that the link between bushmeat extraction from tropical forests and unsustainable use is likely to be more complicated (Cowlshaw *et al.*, 2005). Much of the conservation interest relates to pristine forest ecosystems, whereas hunting often takes place in the more productive farm-bush ecotone along forest edges that are characterized by a much higher mammal biomass. Some bushmeat species, such as duikers, thrive in secondary forest and may be able to sustain relatively high levels of hunting pressure; others may be pest species that succeed in agricultural mosaics and have both ecological and economic value. Barnes (2002) points out that forest edge is twice as productive as the interior. For example, duiker biomass estimates vary from 101 to 1497 kg/km² across the Congo Basin (Wilkie and Carpenter, 1999), and it is evident that the variance in production mirrors the range in density estimates. This may help to account for the frequent discrepancy between estimated stock levels and the actual offtake. Without doubt, African societies have harvested and traded bushmeat for centuries, and the hunted species would have disappeared a long time ago if sustainability was not somehow elemental to the system (Lewicki, 1974; Mendelson *et al.*, 2003). Thus, as referred to by several authors (Kormos *et al.*, 2003; Cowlshaw *et al.*, 2005), the extent to which the bushmeat trade is sustainable or unsustainable is both complex and dynamic. There are a number of variables, contingent on

a variety of supply-and-demand factors, price elasticity, accessibility, distance to markets, and human density, as well as the ecology of the hunted species.

As can be seen from the results in this research, Central Africa is characterized by net deforestation and forest is the primary habitat of most of the hunted game species (Haltenorth and Diller, 1992). Thus, deforestation has an impact upon the quantity of game meat harvested and consumed. Vast areas of formerly isolated forest have been opened up for logging throughout Central Africa. Consequently the quantity of game meat supplied to the bushmeat markets is likely to increase initially, which corresponds to the observed trend in Table 3. Fa *et al.* (2000) report a similar pattern in Equatorial Guinea where, in absolute numbers, more carcasses appeared in the bushmeat markets in 1996 as compared to 1991. Furthermore, recently opened up forest frontier areas have often been newly settled by substantial numbers of frequently landless migrant people seeking new livelihoods and/or employment opportunities with logging operations, and thus increasing the demand for bushmeat. Fa *et al.* (2003) note that the extraction of bushmeat in the Congo Basin can be seen as a density-dependent phenomenon, since extraction increases linearly with human population growth. The offtake by commercial hunters in the Lobeke region of south-eastern Cameroon was found to be ten times more per immigrant hunter than for local subsistence hunters, for whom it was only 2.9 animals/hunter/month (WCS, 1996).

Gradual declines in wildlife as a result of over-hunting have been documented in Cameroon (Maisels *et al.*, 2001): the process of species extirpation in the Kilum-Ijim area began over 100 years ago with the loss of megafauna, possibly beginning with elephants (several generations ago), and certainly with buffalos (at least 20 years ago). In contrast to gradual declines, Barnes (2002) points out that a sudden, unexpected collapse of forest animal populations is more likely—similar to the boom-and-bust situation observed in fisheries. This could prove to be problematic as decision-makers might not act until it is too late because governments are hesitant to address the bushmeat trade during the boom phase of a good harvest. Therefore, the raw FAOSTAT data as expressed in tonnes per year might be misleading since they largely acknowledge an increase of presumed bushmeat harvest throughout the years of reference. However, if production is adjusted to a unit of area and indexed to a base year, a trend becomes obvious that the production gradient diminishes in several countries, namely the Democratic Republic of Congo, Gabon and Central African Republic.

Livelihood perspective

Bushmeat hunting is a key component of many peoples' livelihoods in Central Africa. Within the last 20 years, much of this hunting is believed to have become increasingly unsustainable. A greater proportion of hunting was previously often largely subsistence in nature, employing local, relatively low impact, technologies and carried out by relatively small numbers

BUSHMEAT CONSUMPTION PER CAPITA

	r (correlation)	R ² (coefficient of determination)	p (corresponding two-tailed probability)
Forest cover (%)	0.7888	0.6222	0.113
Forest area per capita	0.9693	0.9395	0.0064
Protected area (%)	0.1829	0.0335	0.7699
Rural population (%)	-0.8985	0.8073	0.0383
Population density	-0.5535	0.3063	0.3335
HDI	0.732	0.5358	0.1598
GDP based on PPP per capita	0.9805	0.9613	0.0032
Consumption of domestic meat per capita	-0.0068	0.0001	0.9926

Table 4. Results of test of significance of regression for bushmeat consumption per capita.



NATHALIE VAN VLIET

CHILDREN SELLING MEAT OF THE AFRICAN BRUSH-TAILED PORCUPINE *ATHERURUS AFRICANUS*, SOUTH-WEST CAMEROON, 2008 (LEFT).

A LOGGING TRUCK BEING CHECKED BY FOREST GUARDS IN SOUTH-EAST CAMEROON. LOGGING TRUCKS ARE OFTEN USED TO TRANSPORT ILLEGAL BUSHMEAT TO THE COUNTRY'S MAJOR CITIES (BELOW).

of long-term forest-resident peoples. However in recent years, the nature of bushmeat hunting has radically changed. The causes of this transformation are complex but include population growth, urbanization and socio-economic development (Redmond *et al.*, 2006).

The transformed FAOSTAT data appear to be an underestimate of the total bushmeat consumption in Central Africa, particularly if compared to the suggestive values provided by Wilkie and Carpenter (1999) who provide an average consumption rate for Central Africa of 36.31 kg/person/year. On the other hand, it is evident that precise evaluation of the quantity of wild meat consumed per capita fluctuates widely, with hunter-gatherers eating between 36 kg and 144 kg of bushmeat per year, while rural and urban populations consume between 14 kg and 57 kg and one kilogramme and 33 kg, respectively (Nasi *et al.*, 2008). Chardonnet *et al.* (2002) calculated the game meat consumption for forest and savannah/forest ecological regions at 5.3 and 3.3 kg/person/year, respectively, which is lower than the average bushmeat consumption for the Congo Basin range States according to the FAOSTAT data at 6.2 kg/person/year. It is evident that more standardized data are required to assess systematically the consumption of bushmeat at national level and the FAOSTAT data seem to be hugely compromised. This is crucial as Fa *et al.* (2003) predict that bushmeat protein supplies would drop by 81% in all Central Africa in less than 50 years, and that only Gabon would be able to maintain a protein supply above the recommended daily requirement of 52 g/person/day (FAO/WHO, 1985).

Furthermore, the results indicate that with the urbanization of African societies, the demand for bushmeat also increases. It is not clear at this stage

whether an improved road system as well as changes in hunting technology, with access to new, non-traditional and more efficient hunting technologies may be accounted for. However, it is certain that the growing urban population creates very substantial and significant demands on natural resources over forest areas hundreds of kilometres distant (Ape Alliance, 1998).

De Merode *et al.* (2004) found that among those on an income of less than one US dollar per day, most bushmeat was sold on the market and not consumed. The evidence suggests that the long-term prospects for bushmeat relate primarily to survival strategies and safety-net functions rather than to rural transformation. Thus, the potential of bushmeat as a driver of socio-economic development needs to be investigated further (Davies, 2002). Furthermore, both fish and bushmeat exhibited the characteristics of superior goods since bushmeat sales were influenced by the economic status of the household (De Merode *et al.*, 2004). The results in this study are overwhelmingly supported by this



OLIVIER VAN BOGAERT / WWF-CANON



NATHALIE VAN VLIET

BUSHMEAT MARKET, MAKOKOU, GABON, 2007 (LEFT).

FUELWOOD IN LIMBE, CAMEROON, 2008 (BELOW). UNSUSTAINABLE AND ILLEGAL FUELWOOD COLLECTION TRIGGERS THE BUSHMEAT CRISIS.

argument since the consumption of bushmeat is positively correlated to purchasing power. Therefore, policy makers must ensure that raising household wealth through development assistance does not result in undesirable impacts on the conservation status of wildlife. Wilkie *et al.* (2005) found that fish and bushmeat were dietary substitutes in Gabon and suggest that economic levers such as taxation or supply reduction through better law enforcement can be used to change demand for wildlife. On the other hand, the role of domestic meat as a substitute for wild meat appears to be limited: reducing the price of domestic meat does not reduce the consumption of bushmeat (Damania *et al.*, 2005).

Methodological issues

An apparent limitation of the FAOSTAT data is that they neither differentiate the range of species taken nor capture the actual volume of bushmeat exploited. Rodent, snail and insect species, which are often consumed by the hunter and his family, hardly appear in the markets and therefore do not appear in the statistics (Ntiemoa-Baidu, 1997).



ROLAND MELISCH / TRAFFIC

Nowadays, there is overwhelming scientific evidence that the current bushmeat trade in Central Africa is having a negative impact on populations of vulnerable species, resulting in local extinctions that could ultimately lead to global extinctions (Fa *et al.*, 2003). Forty-two mammalian species of international conservation concern are identified in the commercial African bushmeat trade (CITES, 2000; Redmond *et al.*, 2006), the majority of which are primates (20) and duikers (10). WWF (2003) estimates that as many as 3000 to 6000 great apes are being killed annually across Africa for the bushmeat trade. There is also anecdotal evidence that elephants are hunted for their meat in Central Africa (Stephenson, 2007). Although large-bodied species such as elephants and gorillas are a small percentage of the total trade, this level of offtake is a real conservation problem.

The incompleteness and inaccuracy of bushmeat production statistics are the major problem encountered in developing countries. In such instances, FAO estimates annual production figures by multiplying population numbers and per capita food consumption data derived from secondary sources. These estimates are based on the limited records reported to wildlife departments or on food consumption surveys, such as those reported by FAO. Currently, the data collection is not based on a standardized survey method. Therefore, varying effort in data capture and/or reporting might influence changes in the game meat production. Although FAO reports the estimates of production of game meat to its Member States, there is general concern from within FAO regarding the accuracy of the underlying basic statistics of population, supply and consumption of foods and of their nutritive value. These vary a great deal between countries, both in terms of coverage as well as in accuracy and are likely to be compromised. Furthermore, different conversion factors for calculating live weight estimates from dressed or smoked bushmeat species must be taken into consideration. Among the practical issues that often

must be addressed in constructing food balance sheets, a conceptual problem frequently arises with respect to the coverage of the basic data: production statistics are mostly confined to commercialized major food crops. Under conditions such as those prevailing in many developing countries, an appreciable part of total bushmeat production is non-commercial or subsistence production, and there is imminent risk that this substantial part of the low consumption level of animal protein is completely excluded from the food balance sheets (FAO, 2009).

However, it should be noted that despite problems related to their accuracy, national food balance sheets as well as nutritional and consumption surveys are the most readily available official sources for information on production of game meat at the national level (Ntiamao-Baidu, 1997). Through data derived from the food balance sheets, it is possible to calculate values of bushmeat production per unit area and consumption per capita. Although the FAOSTAT data are most probably underestimates of the actual harvested bushmeat volume in Central Africa and should, therefore, be regarded with caution, they may indicate trends of bushmeat production and consumption. In the context of rapid changes in human populations and forest exploitation, these trends have the potential to formulate the baseline generalizations that are necessary to inform and direct solutions to the bushmeat problem. Therefore, transformed data from food balance sheets as described in this study, may serve as makeshift indicators to support a system with which trends of bushmeat production and consumption can be monitored. In order to design effective conservation strategies to address the bushmeat problem in the long-term, more sophisticated bushmeat trade indicators need to be developed for which detailed information on markets and preferences is required.

RECOMMENDATIONS

This paper is meant to serve to alert researchers, resource managers and decision-makers that FAO has a statistical system in place that captures and reports the annual production of bushmeat in Cameroon, the Republic of Congo, the Democratic Republic of Congo, Gabon and the Central African Republic. The system is based on estimates derived from food balance sheets. Although the FAOSTAT figures may lead to the conclusion that bushmeat exploitation is below the sustainability threshold for certain countries, the conservation opinion largely supports the view that the current situation of bushmeat hunting in Central African rainforests is more precarious than previously thought. Until recently, no nationwide bushmeat monitoring system has been developed which allows trends in bushmeat harvest and wild meat consumption to be estimated. Data derived from the FAOSTAT and additional online-databases provide useful information that can be used as an initial step to design a cost-effective national environmental management system with which the state of the bushmeat resource and the pressure upon it can be monitored. Thus, there is an urgent need for

streamlining and validation of data from various ecological and socioeconomic sources to help better manage the bushmeat resource. The author recommends that FAO, decision-makers in Central Africa and conservationists discuss further how provisions can be put in place to improve on the limitations of the game meat production data in the FAOSTAT database and increase accuracy.

ACKNOWLEDGEMENTS

The author is grateful to Vera Reifenstein who provided invaluable support in gathering information from online-databases; Patrick Schwab compiled the data on protected areas. Roland Melisch, Stéphane Ringuet and Henriette Bikie kindly improved earlier versions of this text. Brooks Ferebee from the University of Frankfurt gave valuable comments on the statistical sections. The author would also like to thank Nathalie van Vliet, Yaa Ntiamao-Baidu, David Wilkie and John Fa who critically reviewed the manuscript. This research has been conducted under a grant by TRAFFIC. The author and TRAFFIC are indebted to the German Ministry for Economic Cooperation and Development (BMZ) for providing financial support for this study.

REFERENCES

- Ape Alliance (1998). *The African bushmeat trade—a recipe for extinction*. Cambridge, UK.
- Barnes, R.F. (2002). The bushmeat boom and bust in West and Central Africa. *Oryx* 36(3):236–242.
- Bennett, E. and Robinson, J. (2000). *Hunting of Wildlife in Tropical Forests. Implications for Biodiversity Forest Peoples*. Biodiversity Series—Impact Studies Paper No. 76. EU, WCS. New York, USA.
- Brown, D. and Williams, A. (2003). The case for bushmeat as a component of development policy: issues and challenges. *International Forestry Review* 5(2):148–155.
- Chardonnet, P., Des Clers, B., Fischer, J. Gerhold, R. Jori, F. and Lamarque, F. (2002). The value of wildlife. *Review sci. techn. Off. Int. Epiz.* 21(1):15–51.
- CITES (2000). Bushmeat as a trade and wildlife management issue. CoP11 Doc. 11.44. Eleventh Meeting of the Conference of the Parties, Gigiri (Kenya), 10–20 April 2000. <http://www.cites.org/eng/cop/11/doc/44.pdf>.
- Cowlshaw, G., Mendelson, S. and Rowcliffe, J.M. (2005). Evidence for post-depletion sustainability in a mature bushmeat market. *Journal of Applied Ecology* 42:460–468.
- Damania, R., Milner-Gulland, E.J. and Crookes, D.J. (2005). A bioeconomic analysis of bushmeat hunting. *Proceeding of the Royal Society of London* 272:259–266.
- Davies, G. (2002). Bushmeat and international development. *Conservation Biology* 16(3):587–589.
- De Merode, E., Homewood, K. and Cowlshaw, C. (2004). The value of bushmeat and other wild foods to rural households living in extreme poverty in Democratic Republic of Congo. *Biological Conservation* 118(5):573–581.
- Draulans, D. and Van Krunkelsven, E. (2002). The impact of war on forest areas in the Democratic Republic of Congo. *Oryx* 36(1):35–40.
- Fa, J.E., Juste, J., Perez del Val, J. and Castroviejo, J. (1995). Impact of market hunting on mammal species in Equatorial Guinea. *Conservation Biology* 9:1107–1115.

- Fa, J.E., Juste, J. and Castelo, R. (2000). Bushmeat markets on Bioko Island as a measure of hunting pressure. *Conservation Biology* 14(6):1602–1613.
- Fa, J.E., Peres, C.A. and Meeuwig, J. (2002). Bushmeat exploitation in tropical forests: an intercontinental comparison. *Conservation Biology* 16:232–237.
- Fa, J.E., Curries, D. and Meeuwig, J. (2003). Bushmeat and food security in the Congo Basin: linkages between wildlife and people's future. *Environmental Conservation* 30(1):71–78.
- FAO/WHO (1985). Energy and protein requirements. *WHO Technical Report Series* 724. Geneva, Switzerland: World Health Organization. 60 pp.
- FAO (2009). Food Balance Sheets and The Food Consumption Survey: A Comparison of Methodologies and Results. <http://www.fao.org/economic/ess/methodology/methodology-systems/food-balance-sheets-and-the-food-consumption-survey-a-comparison-of-methodologies-and-results/it/>. Viewed on 5 September 2009.
- Fairhead, J. and Leach, M. (1998). *Reframing deforestation: global analysis and local realities*. Studies in West Africa. Routledge, London, 238 pp.
- Haltenorth, T. and Diller, H. (1992). *A Field Guide to the Mammals of Africa*. Collins Field Guide, London.
- Hawthorne, W. (1993). Forest regeneration after logging: findings of a study in the Bia South Game Production Reserve, Ghana. *ODA Forestry Series* 3, London, Kumasi.
- Hill, K. and Hawkes, K. (1983). Neotropical hunting among the Aché of Paraguay. In: Hames, R. and Vickers, W. (Eds) *Adaptive Responses of Native Amazonians*. Academic Press, New York, Pp.139–188.
- Jarman, P.J., 1974. The social organization of antelope in relation to their ecology. *Behaviour* 48:215–267.
- Kormos, R., Bakarr, M., Bonnénin, L. and Hanson-Alp, R. (2003). Bushmeat hunting as a threat to chimpanzees in West Africa. In: Kormos, R. and Boesch, C. (Eds) *West African Chimpanzees*. IUCN, Gland, Switzerland.
- Lewicki, T. (1974). *West African Food in the Middle Ages*. Cambridge University Press, Cambridge.
- Maisels, F., Keming, E., Kemei, M. and Toh, C. (2001). The extirpation of large mammals and implications for montane forest conservation: the case of the Kilum-Ijim Forest, Northwest Province, Cameroon. *Oryx* 35(4):322–331.
- Matsura, N. (2004). Residential group of Babongo Pygmies in southern Gabon. In: An International Symposium: *African great apes evolution, diversity and conservation; formation of a strategic base for the multidisciplinary strategy for biodiversity*. Kyoto University, Japan.
- Mendelson, S., Cowlshaw, G. and Rowcliffe, J.M. (2003). Anatomy of a bushmeat commodity chain in Takoradi, Ghana. *Journal of Peasant Studies* 31:73–100.
- Nasi, R., Brown, D., Wilkie, D., Bennett, E., Tutin, C., van Tol, G. and Christophersen, T. (2008). *Conservation and Use of Wildlife-based Resources: the Bushmeat Crisis*. Secretariat of the Convention on Biological Diversity, Montreal, and Center for International Forestry Research (CIFOR), Bogor. Technical Series no. 33. 50 pp.
- Ntiama-Baidu, Y. (1997). Wildlife and food security in Africa. *FAO Conservation Guide—Technical papers* no. 33.
- Pearce, J. and Ammann, K. (1995). *Slaughter of the Apes: How the Tropical Timber Industry is Devouring Africa's Great Apes*. World Society for the Protection of Animals, London, UK.
- Redford, K.H. (1992). The empty forest. *Bioscience* 42:412–422.
- Redmond, I., Aldred, T., Jedamzik, K. and Westwood, M. (2006). *Recipes for Survival: Controlling the Bushmeat Trade*. World Society for the Protection of Animals, London, UK.
- Robinson, J. and Bennett, E. (2000). Carrying capacity limits to sustainable hunting in tropical forests. In: Robinson, J. and Bennett, E. (Eds) *Hunting for Sustainability in Tropical Forests*. Cornell University Press. Pp.13–30.
- Robinson, J. and Bennett, E. (2002). Will alleviating poverty solve the bushmeat crisis? *Oryx* 36(4):332.
- Sokal, R. and Rohlf, F.J. (1995). *Biometry: the principles and practices of statistics in biological research*. Freeman and Company, New York. 850 pp.
- Stephenson, P.J. (2007). *WWF Species Action Plan: African Elephant, 2007–2011*. WWF, Gland, Switzerland. 74 pp.
- Terborgh, J. (1999). *Requiem for Nature*. Washington, DC, Island Press. xii, 234 pp.
- Waltert, M., Faber, K., and Mühlenberg, M. (2002). Further declines of threatened primates in the Korup Project Area, south-west Cameroon. *Oryx* 36(3):257–265.
- Whitfield, J. (2003). Bushmeat: the law of the jungle. *Nature* 421:8–9.
- Wilkie, D.S. and Carpenter, J. (1999). Bushmeat hunting in the Congo Basin: an assessment of impacts and options for mitigation. *Biodiversity and Conservation* 8:927–955.
- Wilkie, D.S., Starkey, M., Abernethy, K., Nstame Effa, E., Telfer, P. and Godoy, R. (2005). Role of prices and wealth in consumer demand for bushmeat in Gabon, Central Africa. *Conservation Biology* 19(1):269–274.
- WCS (1996). *The Lobéké Forest: Southeast Cameroon. Summary of Activities Period 1988–1995*. New York, USA.
- WWF (2003). *Conservation of Africa's Great Apes*. WWF, Gland, Switzerland.
- Ziegler, S., Nikolaus, G. and Hutterer, R. (2002). High mammalian diversity in the newly established National Park of Upper Niger, Republic of Guinea. *Oryx* 36(1):73–80.

Stefan Ziegler, Species Focal Point, Forest Programme, WWF Germany, Rebstockerstrasse 55, 60326 Frankfurt, Germany.

E-mail: stefan.ziegler@wwf.de



Dried or Fried: Amphibians in Local and Regional Food Markets in West Africa

M. Mohnke, A.B. Onadeko, M. Hirschfeld, and M.-O. Rödel

Overexploitation of amphibians is one of the reasons for their worldwide decline. In Africa, the consumption of frogs has not yet been the focus of scientific research. Herein the authors report on investigations carried out in Burkina Faso, Benin and Nigeria, West Africa, based on interviews with frog-collectors, stallholders and consumers. In Burkina Faso, the frog trade mainly takes place on a local scale. In northern Benin and Nigeria, an intensive cross-border trade of amphibians was detected. Frogs, predominantly the African Tiger Frog *Hoplobatrachus occipitalis*, are collected in the north of Nigeria and neighbouring countries, and are subsequently traded into the cities of southern Nigeria. It is likely that the numbers of frogs traded is not sustainable in some areas, and may have already caused declines in frog populations. The frog trade in West Africa needs more attention and detailed investigation in order to avoid any ensuing detrimental consequences for the region's ecosystem.

Fig. 1. Woman selling dried toads at a market in a village in the province of Ganzourgou, Burkina Faso. Photograph: Meike Mohnke

INTRODUCTION

The sustainable use of natural resources is a strong political argument to preserve biological diversity (CBD, 2008). However, overexploitation of these resources is also one of the major threats to the conservation of nature (Cowlshaw, 2005; CBD, 2008). For example, overexploitation is mentioned as one of the reasons for the worldwide amphibian decline (Stuart *et al.*, 2004, 2008). Recently, Warkentin *et al.* (2009) summarized alarming data on numbers of Asian frogs collected for human consumption. In many countries, frogs have always been collected on a local scale as an essential source of animal protein (Angulo, 2008; Mohnke *et al.*, 2009). However, during the past decades frogs have become an important international trading item. By the end of the 1990s the international trade in frogs' legs involved more than 30 countries and in 1998 was valued at approximately USD48.7 million (Teixeira *et al.*, 2001). As it has been claimed that 95% of the traded frogs' legs originate from wild populations, there is growing concern over declining amphibian populations (Warkentin *et al.*, 2009), including potentially severe economic and social impacts (Mace and Reynolds, 2001).

As a consequence of decreasing frog populations, the collection of frogs from the wild was prohibited in various European countries (Neveu, 2004; Oza, 1990). India and

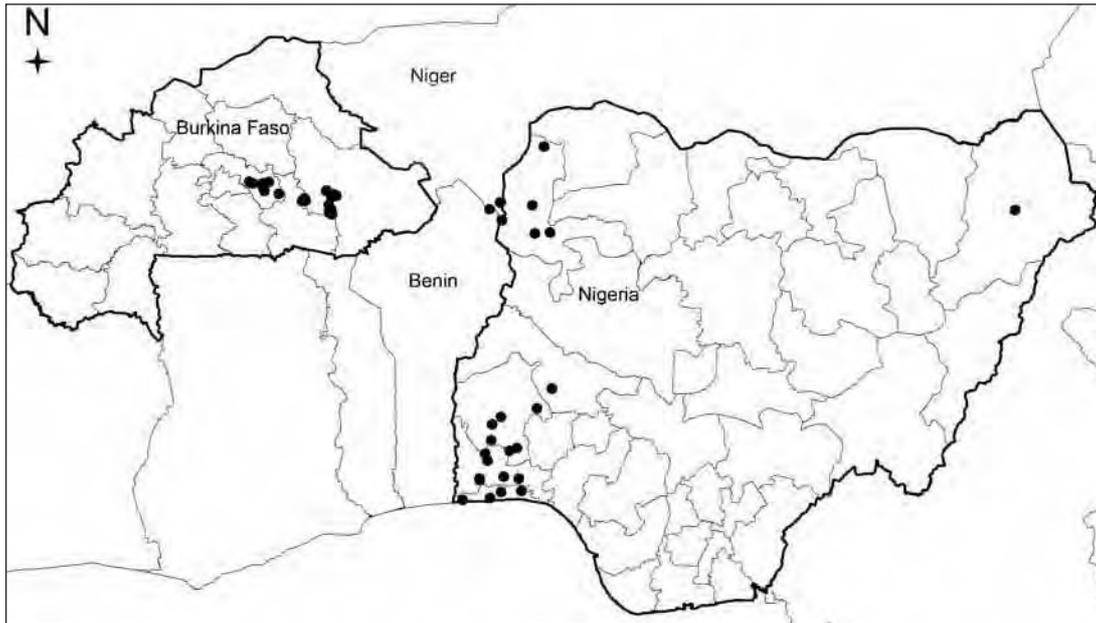


Fig. 2. Map of the study sites in Burkina Faso and amphibian trading spots in Nigeria. Each black dot refers to a village or town where interviews have been carried out. Malanville in Benin was included as a major trading spot for frogs going into the Nigerian food market.

Bangladesh subsequently became the world’s leading producers and exporters of frogs’ legs (Teixeira *et al.*, 2001). However, due to growing evidence that frog declines caused an increase in agricultural pests and mosquitos, these countries banned the collection and trade of frogs. Then, and to date, Indonesia became the world’s main exporter of frogs’ legs, followed by China, Taiwan and Viet Nam (Teixeira *et al.*, 2001; Kusrini, 2005). The local Asian frog trade may be sustainable (Kusrini and Alford, 2006). However, the actual numbers of harvested frogs and the socioeconomic importance of this harvest are largely unknown. This also concerns other parts of the world. In Africa, amphibians are used in medical treatments or for cultural reasons (e.g. Pauwels *et al.*, 2003; Gonwouo and Rödel, 2008), but their importance as human food has so far not been investigated.

The human population in Africa has doubled during the past 20 years (UNPD, 2009) and the need for resources has consequently resulted in an increasing rate of wildlife exploitation (Mace and Reynolds, 2001). African wildlife was traditionally regarded as a valuable

community asset, which was used and protected by customs and taboos. Today, some of these traditions and taboos have become weakened or have disappeared, and the wildlife they previously protected is now exposed to serious threats (Ntiamao-Baidu, 1987). Recently the authors became aware of dramatically increasing demand for frogs in several West African countries. The dimensions of and the actors within this frog market were unknown. The present study is the first to investigate the current market for frogs in the region. Based on interviews conducted in three West African countries, namely Burkina Faso, Benin and Nigeria, the study aims to get an overview of the amount of frogs collected, their use and trade, as well as the socioeconomic value of this market.

METHODS

The study was conducted in Burkina Faso, Benin and Nigeria (Fig. 2). In Burkina Faso, it focused on two

COUNTRY States/Places	BURKINA FASO		BENIN	NIGERIA				TOTAL
	Gourma	Ganzourgou	Malanville	Kebbi	Oyo	Ogun	Lagos	
Villagers	86	43						129
Stallholders	5	19		5	6	3	5	43
Fishermen/Collectors		22	7		17	12	3	61
Traders				5	10	8		23
Customers				5	8	4	3	20
Total	91	84	7	15	41	27	11	276

Table 1. Overview of the numbers, geographic origin and frog-related occupations of the interviewees.

regions: the provinces of Gourma and Ganzourgou. Gourma comprises an urban community—Fada N’Gourma—five rural communities and a total of 231 villages. In 2006, the human population was estimated to be 272 974. Ganzourgou includes an urban community—Zorgho—seven rural communities, 185 villages and about 36 969 households (INSD, 2006). Burkina Faso has few natural resources, often poor, depleted soil, and an unequal distribution of income, resulting in poor economic prospects. About 90% of the population is engaged in subsistence agriculture.

In 2007, the authors observed that large numbers of frogs were collected in Malanville, a city in the north-east of Benin, close to the border with Nigeria and Niger, and that these frogs were exported to Nigeria. The authors followed the trade route into Nigeria and conducted interviews, focusing mainly on the collecting points and trading spots in the State of Kebbi in the north-west of the country, and the larger cities and towns in south-western Nigeria (States of Ogun, Oyo, Lagos).

Eight semi-quantitative structured questionnaires were developed. In Burkina Faso, three questionnaires were applied, one for villagers, one for stallholders (all of whom were female), and one for fishermen. In Malanville, Benin, a slightly modified questionnaire was devised for the fishermen. These questionnaires were in French. In Nigeria, four questionnaires were applied; one for frog collectors, one for traders, one for stallholders and one for customers. These questionnaires were in English. To avoid communication problems, all interviews were carried out with the help of assistants speaking the local language. Photographs of frog species were used in each interview to identify those species that were collected, traded and consumed, respectively. To test the reliability of identifications, some species not occurring in the study areas were included. In general, the questionnaires comprised questions concerning the frog harvest (places and time, methods of harvest, species identities and numbers harvested), the economic and cultural importance of the frogs for the local population and the economic dimension (prices, etc.). On most occasions, people were interviewed in their homes. Owing to the patriarchal society that exists in these countries, interviews mostly took place with the male family heads or with their sons. Accordingly, interviews with women were rare; female market traders being an exception. Table 1 provides a summary of all the interviews carried out. These interviews were conducted between the following periods: January to March 2008 in Burkina Faso; March 2008 in Benin; March to May 2008 and February to March 2009 in Nigeria. To evaluate the development of frog collection in Malanville, an additional visit was undertaken in June 2009.

The exchange rate in Burkina Faso and Benin during the survey period was approximately FCFA503.59 to USD1.00. The exchange rate in Nigeria was NGN149.687 to USD1.00.

RESULTS

Species traded

In Burkina Faso, the African Tiger Frog *Hoplobatrachus occipitalis* was the species that the greatest number of people stated that they had consumed, followed by *Pyxicephalus edulis*, *Ptychadena bibroni*, *P. oxyrhynchus* and *P. trinodis* (Fig. 3). Toads, *Amietophrynus* spp., also rank among the 10 species most often identified by people as being consumed, which is remarkable given the toxic compounds contained in toad skins. Toads seemed to be especially preferred by people in particular villages in Ganzourgou. In Malanville, Benin, *Hoplobatrachus occipitalis* was by far the most commonly caught and traded frog, followed by *Ptychadena* spp. and *Pyxicephalus edulis*. In Nigeria, people likewise preferred *Hoplobatrachus occipitalis* which was traded by all 23 traders interviewed (100%), followed by *Xenopus muelleri* (26%) and *Ptychadena oxyrhynchus* (13%) (Fig. 3). *Xenopus muelleri* seems to be avoided by customers and traders in Burkina Faso. In general, large frogs were preferred over smaller ones. Consumers did not discriminate between the sex of the frogs they consumed; however, females tend to be larger. In Nigeria, 44% of collectors caught frogs of all sizes available in order to meet demand.

Collecting seasons, sites and methods

Collection methods generally differed between villagers catching frogs for self-supply and commercial frog collectors. Within the latter group, 13 of the 22 interviewed persons in Burkina Faso stated that they were fishermen. Eighty-two villagers in Burkina Faso provided details about collecting methods. They usually caught frogs in rivers or on river banks (61%). Many frogs, particularly *Hoplobatrachus occipitalis*, accumulate at rivers during the dry season (Spieler, 1997; Rödel, 2000). Other collecting locations were temporary ponds (29%), dams (24%), wells (21%), permanent ponds (22%) and swamps (5%). Usually frogs were collected in close proximity (less than one kilometre) to the collector’s home (78%).

In Burkina Faso, the frogs were usually collected during the dry season (57%). Here, the population mostly comprised farmers who cultivate their fields during the rainy season and thus do not have time to collect frogs. However, 29% of the villagers stated that they collect frogs all year round and 13% collected them exclusively during the rainy season. All of the professional collectors (n=22) caught frogs at rivers; 82% collected frogs during the dry season. One person (4%) caught frogs during the rainy season and three collectors (14%) caught frogs all year round.

In general, the consumption of frogs for villagers in Burkina Faso was more important than their sale. They

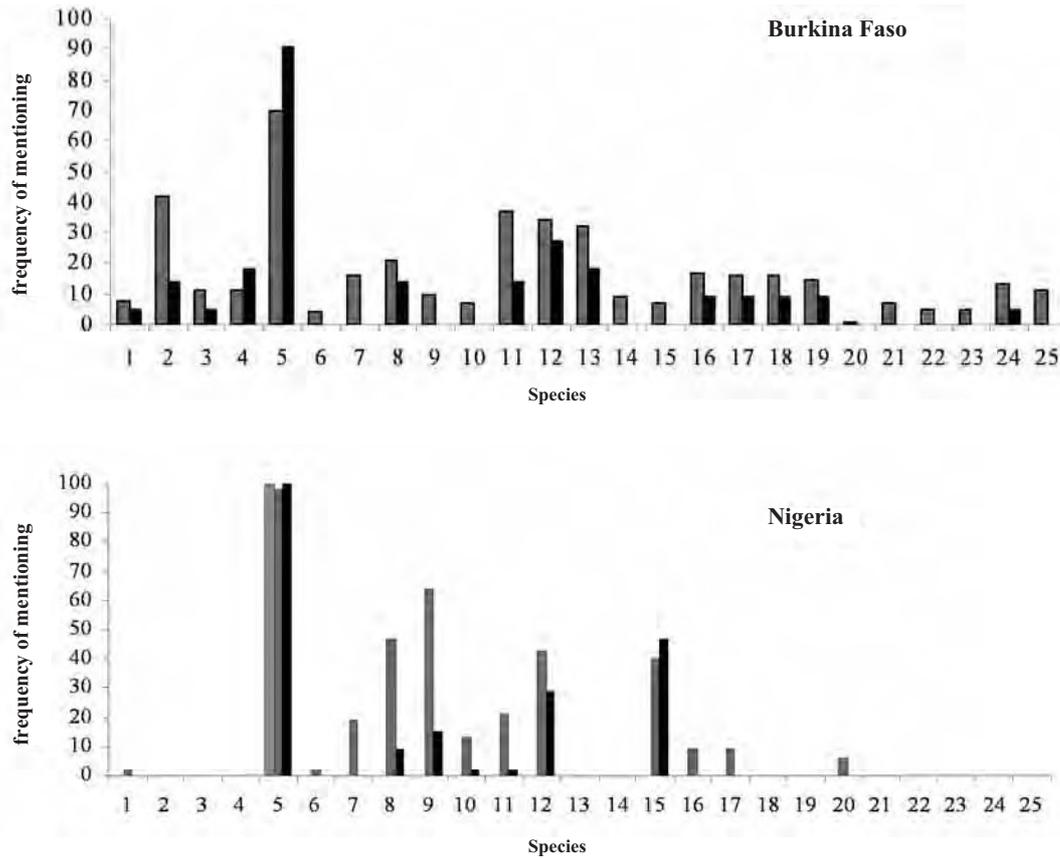


Fig. 3. Species consumed and traded in Burkina Faso and Nigeria¹ (consumed species: grey bars; traded species: black bars; species traded from Malanville, Benin, to Nigeria: grey patterned bar). ¹These figures reflect the number of times a species was identified in photographs by interviewees to show which species they consumed or traded. Species listed by numbers: 1. *Hemisis marmoratus*, 2. *Pyxicephalus edulis*, 3. *Tomopterna cryptotis*, 4. *Hildebrandtia ornata*, 5. *Hoplobatrachus occipitalis*, 6. *Hylarana galamensis*, 7. *Ptychadena schillukorum*, 8. *P. pumilio*, 9. *P. mascareniensis*, 10. *P. tournieri*, 11. *P. bibroni*, 12. *P. oxyrhynchus*, 13. *P. trinodis*, 14. *P. tellinii*, 15. *Xenopus muelleri*, 16. *Amietophrynus maculatus*, 17. *A. regularis*, 18. *A. pentoni*, 19. *A. xeros*, 20. *Hyperolius nitidulus*, 21. *Phrynobatrachus francisci*, 22. *P. natalensis*, 23. *Leptopelis viridis*, 24. *L. bufonides*, 25. *Kassina fusca*.

(n=82) usually caught frogs by hand (79%), but other methods used include the use of hooks (23%), fishing nets (17%), dip nets (7%), basket traps (6%), truncheons (5%), chasing frogs out of small water puddles (5%), pitfalls (bucket traps or simple holes in the ground) (1%) and placing buckets over the frogs (1%). Thirty-two percent of the professional collectors also caught frogs with their hands. However, they otherwise tended to apply different catching methods. Fishermen often caught frogs in the same nets they use to catch fish (50%), or with hooks (23%). Further methods comprised: pitfalls at the edge of dams (18%), basket traps (Fig. 4) which get placed in shallow water or swampy terrain overnight (9%) or special dip nets (5%). Collected frogs were usually sold to female market traders who fry most specimens in oil before selling them individually. Sometimes the frogs are disembowelled before being fried, however they are also fried and sold whole. Toads are skinned, beheaded, washed and then dried for sale.

In Malanville, northern Benin, almost all frogs collected for the Nigerian market originate from the banks and tributaries of the River Niger. In 2008, all collectors

in Malanville, whether from Benin or Nigeria, stated that they used basket traps to catch frogs (n=7). However, in 2009 the Nigerian frog collectors applied a different method: by the end of the dry season (June/July), they went out during the night and used torches to detect the frogs by eye shine. With the help of long wooden sticks they beat the frogs on their heads. Given the extremely high numbers of frogs caught (see “Dimensions of the frog trade”), this method seems to be the most efficient one. Frogs for the Nigerian market are either smoked or dried.

Within survey areas in Nigeria, the majority of frogs were caught from permanent ponds (81%; interviewees n=32), followed by temporary ponds (72%), rivers (48%), swamps (32%), forests (16%), and wells (13%). Of the 32 Nigerian collectors interviewed, 28% caught frogs all year round; 72% only collected frogs during the rainy season. They reported that the best time to catch frogs was during the night and/or the early morning hours. Frogs were caught by hand (80%) or with the help of fishing nets (75%), followed by hooks (35%) and basket traps (25%).

Dimensions of the frog trade

In Burkina Faso, 80% of the 129 villagers interviewed stated that frogs are consumed in their villages. In Ganzourgou, 93% answered that frogs are consumed and 67% that they eat frogs themselves. In Gourma, 73% said that frogs are eaten and 48% reported that they themselves eat frogs. Twelve persons (9%) stated that they used to eat frogs in the past but stopped due to increasing prices or decreasing availability. Eighty-four householders (65%) stated that frogs are an important food source for their families. Forty-three provided details concerning the amount of frogs they consume. Together, the 43 households (on average seven persons) consumed 262 kg of frogs per week; that is six kilogrammes (approximately 120 frogs) per household per week. Children often collect frogs for their own consumption while herding cattle. Frogs thus seemed to be an important source of protein. Of 54 interviewees, 38 (70%) stated that they prefer to eat other meat like fish, beef, chicken, goat or sheep. Fifteen persons (28%) preferred frogs over other meat. Nearly one third of the villagers (29%) listed the frog trade as being a very important occupation. The majority of them depend on subsistence agriculture; however, 13 villagers (10%) stated that selling frogs was an important source of income during the dry season. In particular, some collectors and female market traders were dependent on the frog market.

The Burkina Faso frog economy is strictly partitioned between men and women. Whereas men are responsible for collecting, women are responsible for sale (Fig. 1). The only exception is the toad trade. Here, women are engaged in collecting, drying, and selling. Those interviewed stated that they sold frogs mostly during the dry season, although one fourth (25%; n=24) traded frogs all year round. During the respective selling periods, many of the women (42%) sold frogs on a daily basis; one third (33%) sold frogs on 10 days per month. Altogether, 22 of 24 women sold 65 920 frogs per month (approximately 564 640 frogs annually). This included mainly Tiger Frogs and to a lesser extent, toads. The price for one frog depended on its size and usually varied between FCFA25 for a small frog, up to FCFA250 (USD0.05 and USD0.50, respectively) for a large one. Although the toad trade was locally restricted, it often comprised high numbers, e.g. one woman was processing 200 toads, all collected during one day. According to her, she fills three sacks with toads per week, selling each sack for FCFA1500. Although the Burkina Faso frog trade is mainly a local one, orders are also received from restaurants. In Ouagadougou, most restaurants have frogs' legs on their menus at a cost of at least FCFA4000 a dish. In places like Mogtedo, located on main traffic axes, travellers often stop to buy larger numbers of fried frogs for their family and friends.

In Benin and Nigeria, the frog trade has a different dimension. In Nigeria, frogs are mainly consumed in the south of the country. In the States of the south-west, a total of 32 frog collectors were interviewed. On average they collected 97 frogs per week. Hence, these traders collected a total of 2780–3430 frogs per week, or



MEIKE MOHNEKE

FIG. 4. AFRICAN TIGER FROGS *HOPLOBATRACHUS OCCIPITALIS* CAUGHT WITH A BASKET TRAP IN SHALLOW PARTS OF THE RIVER NIGER, NORTHERN BENIN. THE SMALL FISH ARE USED AS BAIT.

2 738 610 frogs annually (this calculation includes only periods where frogs are collected according to the interviewees). However, most of the frogs traded originate from the northern savanna regions in Nigeria, as well as from neighbouring countries (Benin, Niger, Chad). These frogs are transported to trading spots in northern Nigeria (e.g. Lolo, Kano, Benzu, Bagodo). At these places, exclusive frog markets are organized. The traders in Lolo receive their frogs mainly from Benin and Niger. Accurate numbers of harvested frogs could be obtained in Malanville, Benin, where frogs were collected exclusively for this Nigerian market. Many Malanville fishermen recently switched to the collection of frogs. On average, a daily fish catch produced USD3.00–4.00 income. Frogs were usually collected until at least one sack was filled (containing approximately 1000 frogs). In 2008 that took about one week and each sack fetched at least USD20.00. While the overall income was comparable to that which was earned from fish, the advantage of selling frogs was receiving a higher amount of money as a lump sum, thus providing more possibilities for spending the money. By contrast, the daily income from fish was often spent straight away. In addition to the fishermen, Nigerian traders employ young Nigerians, who travel to Malanville to collect frogs. In the latter case, traders provide the trapping tools and pick up the collected frogs once a week. In 2008, seven collectors filled on average 53 sacks of dried or smoked frogs per month. In 2009, the situation had changed drastically. An increased number of collectors, mainly from Nigeria, caught frogs. The authors accompanied a group of 30 collectors. A two-man team collected an average of 500 frogs per night, but these figures could be as low as 200–300 during a full moon, or as many as 1500 frogs. Based on the average numbers, these 30 collectors caught 450 000 frogs during their two-months-stay in Malanville (Fig. 5).

Country	Location	Stakeholder	Unit	Purchase price (local ^{1,2})	Purchase price (USD)	Unit	Sale price (local ^{1,2})	Sale price (USD)	
BURKINA FASO	Diabo	female market trader	3	100	(0.21)	1	50	(0.11)	
	Diabo	female market trader	3-5	100	(0.21)	1	25-50-75-100	(0.05-0.11-0.16-0.21)	
	Fada N' Gourma	female market trader	50 kg	10 000	(21.13)	1 (s)	50	(0.11)	
	Fada N' Gourma, Mogtedo	female market trader				3 (s)	100	(0.21)	
	Fada N' Gourma, Mogtedo	female market trader	1-3	50	(0.11)	1 (l)	100-150-250	(0.21-0.32-0.53)	
	Zorgho	female market trader	5 bowls	375	(0.79)	500	500	(1.06)	
	Zorgho	female market trader	2	2500	(5.28)	4	25-50-100	(0.05-0.11-0.21)	
	Zam	female market trader		50	(0.11)	1-3	100	(0.21)	
	Kabouda	female market trader	2	565	(1.19)	8-10 (l)	50	(0.11)	
	Kabouda	female market trader	2	500	(1.06)	8-10 (s)	25	(0.05)	
	Kabouda	female market trader	2	500	(1.06)	600	600	(1.27)	
	Kabouda	female market trader	2	500	(1.06)	600	600	(1.27)	
	NIGERIA	Iseyin, Ilorin							
		Ogbomosho Eruwa,	collector				5-6 (l)	100	(0.67)
		Oyo Town, Epe, Ibadan	collector				6-7 (l)	100	(0.67)
		Ado-awaye, Abeokuta	collector				12-15 (s)	100	(0.67)
		Eruwa, Ado-awaye, Abeokuta	collector				9-12 (s)	100	(0.67)
Iseyin, Ijebu Ode, Onidundun, Eruwa		collector				6-7 (m)	100	(0.67)	
Onidundun									
Ijebu Ode, Iseyin, Eruwa,		collector				7-10 (m)	100	(0.67)	
Ado-awaye, Abeokuta		collector				6-8	100	(0.67)	
Ijebu Ode		collector				8-9	100	(0.67)	
Epe		collector				sack(s)	500-600	(3.37-4.04)	
Iseyin		collector				sack	700-800	(4.71-5.39)	
Iloron/Ogbomosho		collector							

Table 2. List of frog prices depending on the location and the stakeholder. Prices for Burkina Faso are in FCFA (exchange rate: USD1.00=FCFA503.593, FCFA1000=USD2.066).

¹Prices for Nigeria are in Naira (NGN) (exchange rate: USD1.00=NGN149.687; NGN1000=USD6.745). The USD prices are displayed in parentheses. The frogs are listed in the respective unit in which they are sold (numbers of specimens; kg; bowls=50-70 specimens; sacks=approximately 1000 specimens; box=> 1000 specimens).

(s) = small; (m) = medium; (l) = large

Country	Location	Stakeholder	Unit	Purchase price (local ^{1,2})	(USD)	Unit	(local ^{1,2})	Sale price (USD)
NIGERIA (ctd)	Ijebu Ode	collector	sack	200–800	(1.35–5.39)	sack	200–800	(1.35–5.39)
	Odo Jabore	collector	sack	800	(5.39)	sack	800	(5.39)
	Abeokuta	collector	sack	800–900	(5.39–6.06)	sack	800–900	(5.39–6.06)
	Epe	collector	sack	1000	(6.73)	sack	1000	(6.73)
	Lolo	trader	sack	6000–10 000	(40.40–67.34)	sack	6000–10 000	(40.40–67.34)
	Iseyin	trader	bundle 6–10	150–200	(1.01–1.35)	bundle 3–5	80–90	(0.54–0.61)
	Iseyin	trader	bundle 5–10	150–200	(1.01–1.35)	bundle 5–10	250–400	(1.68–2.69)
	Ogbomoshosho	trader	bundle 6–7 (m)	80–100	(0.54–0.67)	bundle 8–10 (m)	100–200	(0.67–1.35)
	Ogbomoshosho	trader	bundle 5–6 (l)	150–200	(1.01–1.35)	bundle 3–4	100–150	(0.67–1.01)
	Ijebu ode	trader	7–9 (m)	100–250	(0.67–1.68)	7–9 (m)	150–300	(1.01–2.02)
	Ijebu ode	trader	5–6 (l)	100–250	(0.67–1.68)	bundle 5–6 (l)	150–300	(1.01–2.02)
	Oyo Town	trader	bundle 8–10	100–250	(0.67–1.68)	4–5	60–150	(0.40–1.01)
	Oyo Town	trader	9–12	80–250	(0.54–1.68)	4	50–100	(0.34–0.67)
	Oyo Town	trader	6–8	100–300	(0.67–2.02)	4	50–100	(0.34–0.67)
	Abeokuta	trader	8–12	100–300	(0.67–2.02)	8–12	150–350	(1.01–2.36)
	Pakoto/Ibo	trader	5–10	100–300	(0.67–2.02)	5–10	150–350	(1.01–2.36)
	Sagamu	trader	8–12	150–300	(1.01–2.02)	8–12	200–400	(1.35–2.69)
	Lolo	stallholder	stallholder	6000–8000	(40.40–53.87)	5–6	6000–12 000	(40.40–80.81)
	Iseyin	stallholder	stallholder	150–200	(1.01–1.35)	300	300	(2.02)
	Ibadan, Oyo Town	stallholder	stallholder	12 000	(80.81)	6	100	(0.67)
	Ogbomoshosho	stallholder	stallholder	10 000–13 000	(67.34–87.54)	5–7	100	(0.67)
	Badagry	stallholder	stallholder	1200–1400	(8.08–9.43)	6–7	200	(1.35)
	Epe	stallholder	stallholder	1500–2000	(10.10–13.47)	4–5	150	(1.01)
	Abeokuta, Sagamu, Ijebu	stallholder	stallholder	100	(0.67)	8–12	200	(1.35)
	Oyo town	stallholder	stallholder	9000–12 000	(60.61–80.81)	6	100	(0.67)

Table 2 (ctd). List of frog prices depending on the location and the stakeholder. ¹ Prices for Burkina Faso are in FCFA (exchange rate: USD1.00=FCFA503.593, FCFA1000=USD2.066).

² Prices for Nigeria are in Naira (NGN) (exchange rate: USD1.00=NGN149.687; NGN1000=USD6.745). The USD prices are displayed in parentheses. The frogs are listed in the respective unit in which they are sold (numbers of specimens; kg; bow/ls=50–70 specimens; sacks=approximately 1000 specimens; box=>1000 specimens).

(s) = small; (m) = medium; (l) = large

Either the collectors themselves travel to Lolo to sell the frogs, or traders purchase the frogs in Malanville and resell them in Lolo. Usually a flat tax fee of FCFA1200 has to be paid when crossing the Nigerian border. Between 70% and 80% of the frogs from the north are transported to Ibadan from where they are distributed to other towns in the south-west of the country. In Ibadan, frogs are also received from Chad all year round. These are collected at Lake Chad and pass through Maiduguri (capital of Borno State). From Kano (capital of Kono State) frogs are traded only during the rainy season. On average, five to 10 sacks of frogs per trader were traded at one market-day in Lolo, e.g. five traders in Lolo traded 36 to 39 sacks per week (Fig. 6). They earned a profit of between NGN1000–2000 (USD20.13–40.25) per sack, each sack costing NGN4000–6000 on purchase and NGN6000–10 000 at sale (Table 2). At subsequent trade centres, towards the south, the traded units got smaller. A unit comprised five to 12 frogs (depending on their sizes) packed in bundles when purchased and three to seven frogs when offered for sale. A bundle was between NGN80–300 on purchase and generated NGN100–400 when sold (profit margin: 50–100%). Market prices everywhere depended on the size and quantity of frogs, as well as on the clients' negotiating abilities. According to 19 traders (83%), prices have been increasing over the past five years. The majority of traders traded frogs all year round; 22% traded them during the rainy season only. The frog trade is predominantly for consumption, but some people (13%) also traded them for medicine. Eighteen of 31 Nigerian customers interviewed bought frogs to consume at home. Seven bought frogs to offer them to restaurants.

In addition to the economic value of amphibians, there is also a cultural worth. Certain frog species have a medicinal importance, i.e. they are used to cure specific illnesses. Traditional medication is especially important in areas where western medicine is either not available or affordable (van der Geest, 1997). In particular, toads and frog species that look similar to toads, such as *Kassina fusca* and *Leptopelis bufonides*, were the species most commonly used in medical treatments.

Declining frog populations?

Based on informants' perception, certain amphibian species have been declining over recent years. Most villagers (n=129) in Burkina Faso thought that water shortage (46%) is the main reason for the frogs' decline, followed by human consumption (15%), habitat degradation (7%) and human population growth (5%). A different picture arose when asking fishermen (n=22) in the country, who believed that the main reason for the decline in amphibian species is habitat degradation (32%), followed by human consumption and water shortage (both 23%). The villagers had observed the highest decline rates in the largest species: *Pyxicephalus edulis*, followed by *Hoplobatrachus occipitalis* and *Ptychadena oxyrynchus*. According to interviewees, toads showed the lowest decline rates. Some villagers even believed that toad numbers were increasing. When a decline was perceived, it was said that frog populations started to decline during the past two decades. These interviewees stated that reduced population numbers of particular frog species was the reason for their low presence in markets currently and that consumption of

FROGS COLLECTED IN MALANVILLE, NORTHERN BENIN, ARE EITHER SMOKED OR DRIED BEFORE BEING EXPORTED EXCLUSIVELY FOR THE NIGERIAN MARKET. *HOPLOBATRACHUS OCCIPITALIS* WAS BY FAR THE MOST COMMONLY CAUGHT AND TRADED FROG AT ALL THE STUDY SITES.



Fig. 5. Piles of frogs, principally *Hoplobatrachus occipitalis*, drying in the sun, Malanville, Benin, June 2009. At least 18 piles of frogs—collected by 30 Nigerian frog collectors—were observed by the authors on one visit.

MAREIKE HIRSCHFELD

frogs had been more common in the past. In northern Benin, some interviewees stated that they had observed a decline in frog populations. In Nigeria, only three of 32 persons perceived a decline in amphibian species, namely in *Hoplobatrachus occipitalis*, *Ptychadena oxyrhynchus* and *Xenopus muelleri*, all species dominating the Nigerian trade. These three persons thought that the decline was due to over-hunting and habitat degradation. However, in Nigeria only the frog collectors were asked this question. In both Benin and Nigeria, the largest decline was perceived for the most exploited species.

DISCUSSION

Recent investigations by Warkentin *et al.* (2009) suggest an unsustainable exploitation of frogs in Asian countries. The present report documents for the first time the local small-scale use of frogs in Burkina Faso and an intensive large-scale, cross-border frog trade between Nigeria and its neighbouring countries. Although the number of frogs traded is smaller than reported by Warkentin *et al.* (2009), the rate of collection in West African amphibians is likely to be unsustainable in the long term. Even during the authors' comparatively short period of observation, a dramatic increase in the number of frogs collected for the Nigerian food market was observed. While frogs are sold in markets in the province of Ganzourghou, frog use is for the most part not a commercial activity in Burkina Faso, e.g. in Gourma most frog consumers catch frogs for themselves. However, for some species even this local consumption seems to be unsustainable and interviewees in Burkina Faso indeed perceived a decline of frog populations, in particular of those species that were consumed. Reports of increasing difficulties in catching frogs, and increasing prices, suggest that current harvest rates are unsustainable. Similar indications have been recently reported from western Cameroon and eastern Nigeria, where even tadpoles are collected for food (Gonwouo and Rödel, 2008). With the data collected for this survey, it is not possible to judge whether the perception of a decline in frog numbers is accurate, and if so, whether it can be attributed exclusively to overexploitation, or what effect other factors such as habitat degradation, pesticide use, and climate changes (i.e. different rainfall patterns), may have. Currently, there are no regulations in any West African countries governing the harvesting of frogs, neither concerning season nor the species, numbers and/or size of specimens harvested. Even more exploiters may enter the system as there is still a net return from the harvest. As there is a huge social and commercial interest—frog collection and consumption being a very important part of villagers' lives—it will be difficult to control or limit this harvest (Ludwig, 2001).

The methods used for collecting frogs varied by area and tradition, and, in particular, in the intensity of the harvest. If frogs were used for self-supply only, or for local consumption or sale, catching them by hand was sufficient. In the areas with the most intense frog collecting activities, as in Malanville, Benin, basket traps

seemed to be a preferred and efficient method. Recently, Nigerian collectors have switched to an even more effective method. They use torchlight to find the frogs at night (Kusrini, 2005; Teixeira *et al.*, 2001), which they then kill by beating their heads with long sticks. This method of killing frogs is not applied in Asia since damaged specimens, especially those collected for export, would be rejected (Kusrini, 2005).

The species of frog preferred varied: the majority of customers and collectors favoured large specimens, but to meet the demand often all available sizes were collected. *Hoplobatrachus occipitalis* is a large frog and the main species used for food at all the study sites. Specimens of *Ptychadena* spp. were often consumed but were not usually traded. *Xenopus muelleri* was the second-most traded frog species in Nigeria. Congeners of this species are also harvested for food in western Cameroon (Gonwouo and Rödel, 2008). By contrast, *Xenopus muelleri* are rarely eaten in Burkina Faso, although they occur there as well. Toads are only consumed in certain villages, e.g. in the Ganzourghou area in Burkina Faso, whereas in the neighbouring Gourma region no respondent ate toads.

Since large specimens are preferred for consumption, the current rate of collecting may well lead to an altered population structure of *Hoplobatrachus occipitalis*, or even result in local extinction. Unfortunately it is not known at what age this species reaches sexual maturity. It is likely that frogs can already reproduce once they have reached about half their maximum size (males 110 mm, females 160 mm; Spieler, 1997; Rödel, 2000). Judging from other species of similarly sized frogs, this is at around two years' old. The largest adults may well be 10 years and older. Overexploitation of *H. occipitalis* may not only have consequences for the human diet, but also for the frogs' ecosystem. A loss of predators may weaken control of prey populations (Allan *et al.*, 2005). In *H. occipitalis*, this may apply to all life stages. This species has predatory larval stages preying on a variety of other aquatic animals such as tadpoles and mosquito larvae, and is thus an important element in the trophic cascade of temporary savanna ponds (Spieler and Linsenmair, 1997; Rödel, 1998). Adult specimens of *Hoplobatrachus occipitalis* feed on a variety of organisms, including potential pest insects (Inger and Marx, 1961; Lescure, 1971). Abdulali (1985) provides a detailed account on the ecology of some rice field-dwelling amphibians in India (including another *Hoplobatrachus* species), highlighting their role as bio-control agents of rice insects. Since India banned the processing and export of frogs, the frog populations have recovered and insecticide imports have dropped by 40% (Teixeira *et al.*, 2001), indicating the large economic value of intact frog populations for pest control.

Ideally, any harvesting of wild species should be done sustainably (Waites, 2007). On a global scale, an increasing number of internationally traded frogs are produced on frog farms (Teixeira *et al.*, 2001; Daszak *et al.*, 2006). While efforts to set up frog farms in Central Africa have been initiated (Munyuli Bin, 2002), the

authors could find no such initiative in West Africa. According to their data, all West African amphibians used for food are from the wild. Although toads are consumed in some countries (Daszak *et al.*, 2006), ranoid frogs, and especially the American Bullfrog *Lithobates catesbeianus* and the Indian Tiger Frog *Hoplobatrachus tigrinus* are the species most commonly bred for consumption. The breeding of non-native species always bears the risk that a) specimens escape and harm native species and ecosystems (Kiesecker *et al.*, 2001; Beebe and Griffiths, 2005) and b) specimens import diseases (Daszak *et al.*, 2004). However, as a species native to West Africa, it might be possible to breed *Hoplobatrachus occipitalis* in captivity. Efforts to cultivate wildlife, in particular fish, are currently being undertaken in northern Benin. It would be worthwhile trying to combine these efforts with breeding frogs.

Cultivation of *Hoplobatrachus occipitalis* would not only help to secure wild populations but would also offer long-term socioeconomic advantages. The inland fishery sector can be indicative of the economic importance of the local frog trade. Besides the income that is gained from the fish catch, the processing of fish encompasses further economic benefits, i.e. employment. In other words, if fish can be produced and processed locally, the net income benefit to the area may be more than twice the value of the fish sales (FAO, 2009). Similar advantages may be expected from the establishment of a captive breeding and processing programme for frogs. However it is important to recognize the potential drawbacks to farming, such as loss of income to villagers not involved in farming, land use and pollution from farms, as well as disease and health risks.

In West African countries, small-scale fishers provide the majority of the national fish catch and contribute to about a quarter of the total protein intake. Hence small-scale fishing plays a vital role in nutrition, trade and economic activity (Marquette *et al.*, 2002). However, due to overexploitation in many inland waters, fish stocks have drastically declined (Brashares *et al.*, 2004; Allan *et al.*, 2005). According to the data collected during this survey, amphibian collection rates increased in Malanville after fish populations in the River Niger declined. Similarly, years of poor fish supply in Ghana coincides with increased hunting rates in that country and has resulted in the decline in biomass of wildlife (Brashares *et al.*, 2004). The increasing West African demand for frogs may therefore be an indirect sign of a decrease of other natural resources and deserves more attention.

Although most decision-makers in West African countries are well aware of the need for wildlife conservation, they are mostly confronted with more pressing problems, such as poor education, failing crops, lack of food and poor health. Having limited funding available, wildlife conservation usually takes low priority (Ntiemoa-Baidu, 1987). However, the dimension of the frog trade in parts of West Africa may not only be a sign of further problems in nature conservation. The decline or even potential loss of frogs in particular areas may have direct and indirect effects on rural communities, such as

increasing mosquito populations, less bio-control of agricultural pest species or negative effects on freshwater ecosystems such as temporary ponds (Mohnke and Rödel, 2009). To address these questions in more depth, more basic data are urgently needed on the quantity of frogs traded, their origin and their customers, as well as information relating to natural frog abundances, population structure, and life history, in order to develop management programmes for sustainable harvests and breeding programmes.

RECOMMENDATIONS

- The basic biology and natural history of the species involved in trade (e.g. life expectancy, mortality and fecundity) needs to be better understood.
- The motivation of the people who are exploiting frogs has to be carefully considered and alternative labour options should be explored.
- Further investigation of the amphibian trade, especially in Nigeria but also in neighbouring countries such as Niger and Chad, should be carried out to provide a complete overview of the dimensions of the frog trade.
- When overexploitation is likely, the respective authorities need to be informed in order to start monitoring the collection and to impose harvesting rules (for example, restricting harvest to particular places, certain seasons, etc.).
- Public awareness concerning the role of amphibians and their ecosystem services should be raised locally.
- Efforts to assess potential costs and benefits of cultivation of the native *Hoplobatrachus occipitalis* involving local stakeholders should be undertaken. To maintain their livelihood, efforts could be made to involve former frog collectors in such activity.

ACKNOWLEDGEMENTS

The authors would like to thank Adjima Thiombiano and Brice Sinsin, as well as all respective authorities in Burkina Faso, Benin and Nigeria for their support and for issuing research permits. They are very thankful to Bilasse Zongo, Ahandi Thiombiano and Geremie Kabore in Burkina Faso; Norbert Assongba and Monique Sabo Gado in Benin and Maureen West, Adewale Olidade, Adesola Akinsola, Zagyanu Hassan, Yakubu Muhammed, Ahamed Kalgo, Utagba Anthony, Patrick Kulo, Ibik Akere, Afolabi Olakunle, and Baba Beji in Nigeria. Johannes Penner designed the map. Ross Alford provided helpful comments on an early draft of this paper. This study is part of the BIOLOG-program of the German Ministry of Education and Science (BMB+F; Project BIOTA-West III, amphibian projects, 01LC0617J).

Fig. 6. Frog market in Lolo, northern Nigeria.

Traders at the frog market in Lolo receive their frogs mainly from Benin and Niger. On average, five to 10 sacks of frogs per trader were traded on one market-day, e.g. five traders traded between 36 and 39 sacks per week. From Lolo, the frogs are transported to the south of the country.

Photograph: Abiodun Onadeko



REFERENCES

- Abdulali, H. (1985). On the export of frog legs from India. *Journal of the Bombay Natural History Society* 2:347–375.
- Allan, J.D., Abell, R., Hogan, Z., Revenga, C., Taylor, B.W., Welcomme, R.L. and Winemiller, K. (2005). Overfishing of inland waters. *BioScience* 55:1041–1051.
- Angulo, A. (2008). Consumption of Andean frogs of the genus *Telmatobius* in Cusco, Peru: recommendations for their conservation. *TRAFFIC Bulletin* 21:95–97.
- Beebee, T.J.C. and Griffiths, R.A. (2005). The amphibian decline crisis: a watershed for conservation biology? *Biological Conservation* 125:271–285.
- Brashares, J.S., Arcese, P., Sam, M.K., Coppolillo, P.B., Sinclair, A.R.E. and Balmford, A. (2004). Bushmeat hunting, wildlife declines, and fish supply in West Africa. *Science* 306:1180–1183.
- CBD (2008). Convention on Biological Diversity. www.biodiv.org. Viewed 21 June 2009.
- Cowlishaw, G., Mendelson, S. and Rowcliffe, J.M. (2005). Evidence for post-depletion sustainability in a mature bushmeat market. *Journal of Applied Ecology* 42:460–468.
- Daszak, P., Striely, A., Cunningham, A.A., Longcore, J.E., Brown, C.C. and Porter, D. (2004). Experimental evidence that the bullfrog (*Rana catesbeiana*) is a potential carrier of chytridiomycosis, an emerging fungal disease of amphibians. *Herpetological Journal* 14:201–207.
- Daszak, P., Schloegel, L., Louise, M., Cronin, A., Pokras, M., Smith, K. and Picco, A. (2006). *The Global Trade in Amphibians: Summary Interim Report of a CCM Study*. Report of the Consortium for Conservation Medicine. Consortium for Conservation Medicine, New York.
- FAO (2009). *The State of the World Fisheries and Aquaculture 2008*. FAO Fisheries and Aquaculture Department. Food and Agriculture Organization of the United Nations, Rome.
- Gonwouo, L.N. and Rödel, M.-O. (2008). The importance of frogs to the livelihood of the Bakossi people around Mount Manengouba, Cameroon, with special consideration of the Hairy Frog, *Trichobatrachus robustus*. *Salamandra* 44:23–34.
- Inger, R. and Marx, H. (1961). The food of amphibians. In: *Mission G.F. de Witte*. Exploration du Parc National de l'Upemba, Institut des parcs nationaux du Congo et du Ruanda-Urundi 64:1–86.
- INSD (2006). Annuaire statistique. Institut national de la statistique et de la démographie. www.insd.bf. Viewed 10 June 2009.
- Kiesecker, J.M., Blaustein, A.R. and Miller, C.L. (2001). Potential mechanisms underlying the displacement of native red-legged frogs by introduced bullfrogs. *Ecology* 82:1964–1970.
- Kusrini, M. (2005). Edible frog harvesting in Indonesia: Evaluating its impact and ecological context. PhD Thesis. School of Tropical Biology, James Cook University, Townsville, Australia.
- Kusrini, M. and Alford, R. (2006). Indonesia's exports of frogs' legs. *TRAFFIC Bulletin* 21:13–24.
- Lescure, J. (1971). L'alimentation du crapaud *Bufo regularis* Reuss et de la grenouille *Dicroglossus occipitalis* (Günther) au Sénégal. *Bulletin de l'Institut fondamental d'Afrique noire*. Série A 33:446–466.
- Ludwig, D. (2001). Can we exploit sustainably? In: Reynolds, J.D., Mace, G.M., Redford, K.H., Robinson, J.G. *Conservation of Exploited Species*. Cambridge University Press. Pp.16–38.
- Mace, G.M. and Reynolds, J.D. (2001). Exploitation as a conservation issue. In: Reynolds, J.D., Mace, G.M., Redford, K.H., Robinson, J.G. *Conservation of Exploited Species*. Cambridge University Press. Pp.3–15.
- Marquette, C.M., Koranteng, K.A., Overå and Bortei-Doku Aryeetey, E. (2002). Small-scale fisheries, population dynamics, and resource use in Africa: the case of Moree, Ghana. *Ambio* 41:324–336.
- Mohneke, M., Onadeko, A.B. and Rödel, M.-O. (2009). Exploitation of frogs—a review with a focus on West Africa. *Salamandra* 45:193–202.
- Mohneke, M. and Rödel, M.-O. (2009). Declining amphibian populations and possible ecological consequences—a review. *Salamandra* 45:203–207.
- Munyuli Bin, M.T. (2002). Controlled frog farming in Kivu (Democratic Republic of Congo). *Cahiers d'études et de recherches francophones/Agricultures* 11:269–274.
- Neveu, A. (2004). La ranculture est-elle une alternative à la récolte? Etat actuel en France. *INRA Productions Animales* 17:167–175.
- Ntiamao-Baidu, Y. (1987). West African wildlife: a resource in jeopardy. *Unasylva* 39:1–10.
- Nigeria Direct (2009). The official information gateway of the federal republic of Nigeria. http://nigeria.gov.ng. Viewed 10 June 2009.
- Oza, G.M. (1990). Ecological effects of the frog's legs trade. *The Environmentalist* 10:39–41.
- Pauwels, O.S.G., Rödel, M.-O. and Toham, A.K. (2003). *Leptopelis notatus* (Anura: Hyperoliidae) in the Massif du Chaillu, Gabon: from ethnic wars to soccer. *Hamadryad* 27:271–273.
- Rödel, M.-O. (1998). *Kaulquappengesellschaften ephemerer Savannengewässer in Westafrika*. Edition Chimaira, Frankfurt/M. 195 pp.
- Rödel, M.-O. (2000). *Herpetofauna of West Africa, Vol. I: Amphibians of the West African Savanna*. Edition Chimaira, Frankfurt/M. 335 pp.
- Spieler, M. (1997). *Anpassungen westafrikanischer Anuren an Austrocknungsrisiko und Räuberdruck in einem saisonalen Lebensraum*. Wissenschaft und Technik Verlag, Berlin. 181 pp.
- Spieler, M. and Linsenmair, K.E. (1997). Choice of optimal oviposition site by *Hoplobatrachus occipitalis* (Anura: Ranidae) in an unpredictable and patchy environment. *Oecologia* 109:184–199.
- Stuart, S.N., Chanson, J.S., Cox, N.A., Young, B.E., Rodrigues, A.S.L., Fischman, D.L. and Waller, R.W. (2004). Status and trends of amphibian declines and extinctions worldwide. *Science* 306:1783–1786.
- Stuart, S., Hoffman, M., Chanson, J., Cox, N., Berridge, R., Ramani, P. and Young, B. (2008). *Threatened Amphibians of the World*. Lynx Editions, Barcelona. 758 pp.
- Teixeira, R.D., Pereira Mello, S.C.R. and Lima dos Santos, C.A.M. (2001). *The World Market of Frog Legs*. FAO/Globefish Research Programme Vol. 86, Rome. 44 pp.
- UNPD (2009). World population prospects: the 2008 revision population database. United Nations Population Division. www://esa.un.org/unpp/index.asp. Viewed 10 June 2009.
- Van der Geest, S. (1997). Traditional medicine in basic health services in Africa. *Tropical Medicine and International Health* 2:903–911.
- Waites, T.A. (2007). Revisiting evidence for sustainability of bushmeat hunting in West Africa. *Environmental Management* 40:476–480.
- Warkentin, I.G., Bickford, D., Sodhi, N.S. and Bradshaw, C.J.A. (2009). Eating frogs to extinction. *Conservation Biology* 23:1056–1059.

M. Mohneke, M. Hirschfeld, M.-O. Rödel,
Museum für Naturkunde, Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin, Herpetology, Invalidenstraße 43, 10115 Berlin, Germany.
E-mail: meike.mohneke@mfn-berlin.de;
mareike.hirschfeld@mfn-berlin.de; mo.roedel@mfn-berlin.de.
A.B. Onadeko, *Department of Zoology, Faculty of Sciences, University of Lagos, Akoka, Yaba, Lagos, Nigeria.*
E-mail: onadeko2002@yahoo.com.



THE TRAFFIC BULLETIN SEIZURES AND PROSECUTIONS SECTION
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

FRANCE

On 18 August 2009, Bordeaux Customs seized 20 live Spur-thighed Tortoises *Testudo graeca graeca* (CITES II) from a van. The van owner said he wanted to offer them to family members living in France. The tortoises, which were covered in oil (reason unknown, although it has been suggested that this may have been carried out to deter detection by sniffer dogs), came from Morocco and were not accompanied by CITES paperwork. They were sent to a veterinarian for treatment and were to be released either in the wild or in a sanctuary.

On 10 September 2009, Customs officers at Roissy Airport, Paris, inspected nine boxes arriving from Niamey, Niger, on route to Miami; two were labelled as Sahara Mastigures *Uromastyx geyri* (CITES II) and contained 193 live lizards (155 kg, five of which were dead). The CITES documentation presented with the shipment was not accepted because it is illegal in Niger to export wild specimens of this species; the specimens were seized. The shipment owner had correct documentation for the other seven boxes (unspecified reptiles).

The seized reptiles were placed in a farm in Paris in order to acclimatize them for eventual release in their natural habitat or an animal reserve.

www.douane.gouv.fr/page.asp?id=3809, 24 August 2009; [TRAFFIC Europe](http://TRAFFIC.Europe); www.douane.gouv.fr/page.asp?id=3815, 17 September 2009

NORWAY

On 25 October 2009, authorities in Kristiansand arrested a Norwegian national when he was stopped for a spot check after leaving a passenger ferry arriving from Denmark. Suspicions were aroused when a tarantula was found loose in his bag. A body search revealed that the man was carrying 14 non-venomous young Royal Pythons *Python regius* (CITES II) that had been rolled up and placed in several layers of socks taped to his chest and legs. Ten cans taped to his legs each contained an albino Leopard Gecko *Eublepharis macularius*.

The man was fined NOK12 500 (USD2220). While the fate of the reptiles was being decided by the authorities, the animals were handed into the care of a security firm.

www.dailymail.co.uk/news/worldnews/article-12231221 Snakes-smuggled-plane-Man-arrested-illegally-importing-snakes-lizards-Norway—taping-reptiles-body.html#ixzz0V85ZbKTV

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)

establishes international controls over trade in wild plants and animals, or related products, of species that have been, or may be, threatened due to excessive commercial exploitation. Parties have their own legislative vehicle by which to meet their obligations under CITES. The species covered by CITES are listed in three Appendices, according to the degree of protection they need:

APPENDIX I includes species threatened with extinction which are or may be threatened by trade. Trade in specimens of these species is permitted only in exceptional circumstances. An export permit from the country of origin (or a re-export certificate from other exporting countries) and an import permit from the country of importation are required.

APPENDIX II includes species not necessarily yet threatened, but which could become so if trade is not strictly controlled. Species are also included in Appendix II if they are difficult to distinguish from other species in Appendix II, in order to make it more difficult for illegal trade to take place through misidentification or mislabelling. An export permit from the country of origin (or a re-export certificate from other exporting countries) is required, but not an import permit.

APPENDIX III includes species that any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and as needing the co-operation of other Parties in the control of trade. Imports require a certificate of origin and, if the importation is from the State that has included the species in Appendix III, an export permit is required.

All imports into the European Union of CITES Appendix II-listed species require both an export permit/re-export certificate and an import permit.

POLAND

On 31 August 2009, a shipment of 25 t of eels declared as *Anguilla japonica* specimens arrived at the port of Szczecin, via Hamburg, from China. Polish Customs carried out DNA tests on the specimens and confirmed that they included European Eels *Anguilla anguilla* (CITES II) as well as *Anguilla japonica* specimens. The importer claims he was not aware of this fact. The consignment was seized and the case is under investigation. The listing of the European Eel in CITES Appendix II came into effect in March 2009.

A Polish company has been found guilty of illegally importing 14 t of *Ginjal*, a drug which contains powdered seahorse *Hippocampus* (CITES II). Although this transaction was in violation of the *Nature Conservation Act*, the court ruled the stock should be returned to the company.

"The illegal tablets should have been confiscated so they can never reach the marketplace," commented Magdalena Romanowicz, Head of WWF Poland's Reducing Illegal Wildlife Trade initiative.

Ginjal is made in Indonesia exclusively for the Polish market and is used to treat urinary infections. One of its principal ingredients is powdered seahorses, which require CITES permits to be internationally traded.

According to Polish Customs, the company in question had imported around 135 million *Ginjal* tablets since 2004 without the necessary documentation. Although Polish police and Customs had on several occasions raised concerns over the legality of such imports, no action was taken because the drug had been registered by the Ministry of Health.

"This clearly indicates a need for greater communication between the Polish authorities: drugs entering the market should be checked not only for health safety but also for adherence to environmental regulations to ensure endangered species are not further threatened", said Romanowicz.

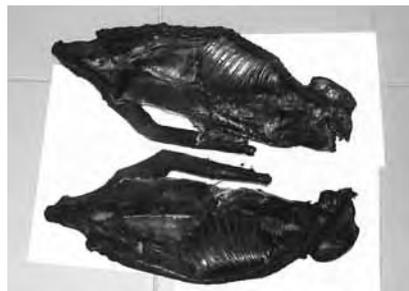
"The history of use of *Ginjal* in Poland clearly shows how a lack of effective action by governmental agencies has allowed a market to exist for a product that should never have made it to our stores", she added.

On 25 October 2009, at Warsaw's international airport, Customs officials seized bushmeat from the luggage of a woman travelling from Cameroon, via Frankfurt, and entering the country via the green "nothing to declare" channel. Her luggage was selected for checking and found to contain carcasses of unidentified, small (circa 40 cm-long) apes/monkeys that had been smoked. The items were confiscated and the police informed.

CITES Management Authority, Poland; www.google.com/hostednews/afp/article/ALeqM5jFg9HENos0-Lxatmxwbal5W2RFfw, 7 September 2009; WWF Poland; www.traffic.org

RUSSIA

It was reported on 2 December 2009 that police officers at Petropavlovsk Airport, Kamchatka, seized nine Gyrfalcons *Falco rusticolus* (CITES I) from the baggage of a Russian national bound for Vladivostok. According to the Kamchatka Krai Wildlife Protection Agency, the rare birds had been wrapped in cloth and hidden in bags equipped with a cooling agent to protect them from overheating on route.



WARSAW CUSTOMS OFFICE

SMOKED CARCASSES OF UNIDENTIFIED APES/MONKEYS FROM CAMEROON, SEIZED IN POLAND.

An administrative offence case was instituted against the Russian national on charges of the illegal smuggling of birds listed in the *Russian Red Book*. Veterinarians had already examined the birds, which were due to be released into the wild on 2 December.

The Gyr Falcon is very popular in Arab countries where it is used for hunting. In the last few years, Kamchatka has experienced a massive surge in the poaching of this species. A woman was detained in Petropavlovsk Airport earlier in 2009 on allegations of smuggling Gyr Falcons from Kamchatka (see also *TRAFFIC Bulletin* 22(2):73).

www.vostokmedia.com/n60943.html, 2 December 2009

UK

In July 2009, UK Border Agency (UKBA) CITES Team officers at Heathrow Airport examined two shipments of cosmetics being imported from the USA. In total some 136 products were seized as they were found to contain Candelilla *Euphorbia antisiphilitica* (CITES II). The shipments were accompanied by valid US CITES export permits but neither had UK CITES import permits, which are required for CITES Appendix II imports to the EU.

The resin-free wax of the plant is used in emollients to protect the skin against water loss and in lipsticks, for example, as well as in the production of food additives and confectionery.

On 5 November 2009, UKBA officers at Heathrow seized a number of African Elephant *Loxodonta africana* (CITES I) ivory items: 219 ivory beads (1.6 kg) were found sewn into items of clothing in transit from Nigeria to China, and an ivory carving concealed inside a wooden statue in transit from Kenya to France. Both had been concealed in express courier parcels. In addition, on 31 August 2009, UKBA officers found eight ivory carvings from Cameroon concealed inside a vessel at Liverpool docks.

On 21 July 2009, the UK National Wildlife Crime Unit, UKBA, Animal Health Agency Inspectors and Greater Manchester Police executed a search warrant at a Chinese medicine centre in Manchester city centre and seized a large quantity of raw and prepared medicines. The raw ingredients included: Costus root *Saussurea costus* (CITES I); tortoises (I/II); Seahorses *Hippocampus* spp. (II); *Cibotium barometz* Dicksoniaceae; American Ginseng *Panax quinquefolius* (II); Desert-living Cistanche *Cistanche deserticola* (II); *Flickingeria* spp. Orchidaceae (II); *Dendrobium* spp. Orchidaceae (II); and *Gastrodia elata* Orchidaceae (II).

Between September and November 2009 at the port of Felixstowe, UKBA officers seized 13 large drums of oil of Guaiacwood or Palo santo *Bulnesia sarmientoi* (CITES III) in three separate seizures (2375 kg). The oil was being imported from Paraguay without the requisite CITES documentation and certificate of origin. Paraguay had a moratorium on exports at the time of export.

In September 2009, at the port of Felixstowe, UKBA officers detected 20 000 kg of frozen European Eel *Anguilla anguilla* (II) being imported from China. The shipment was accompanied by a valid CITES re-export permit but no UK CITES import permit; all the eels were seized.

In December 2009, UKBA officers at the port of Dover intercepted a lorry travelling from Morocco to the UK. Following a thorough inspection of the vehicle, a small box containing four Spur-thighed Tortoises *Testudo graeca* (II) was found. The driver of the vehicle had no CITES import documentation for the specimens, which were all seized.

On 20 August 2009, the Metropolitan Police's Wildlife Crime Unit raided a shop in London's Chinatown and seized over 200 medicinal products claiming to contain the following ingredients: Leopards *Panthera pardus* and Tigers *P. tigris* (both CITES I), musk deer *Moschus* (I/II), and Costus root *Saussurea costus* (I). Officers carried out the raid as part of Operation Charm, a continuing partnership initiative taking action against the illegal trade in endangered species in London. The searches coincided with the coming into effect of an amendment that closes a loophole in the law. These regulations relate to species that are "split-listed" (i.e. different populations or subspecies that are placed in different CITES Appendices, or a population or subspecies listed where another may not be) (see page 95). Previously, investigators were unable to determine the provenance of a specimen listed in the ingredients of manufactured products and therefore which part of the regulations applied. The amendment to the regulation now means that the higher level of protection applies unless there is evidence to the contrary. The shop manager was questioned and enquiries are continuing.

On 5 October 2009, at Luton Crown Court, Nicholas Noonan of Bedfordshire pleaded guilty to charges relating to the illegal trade in CITES I-listed African Elephant *Loxodonta africana* tusks and Sperm Whale *Physeter catodon* teeth, as well as ivory artefacts. He was gaoled for 10 months.

The investigation was launched in 2006 when covert agents from the US Fish and Wildlife Service received an unsolicited e-mail, via eBay, asking them to look at a number of tusks that were listed for sale by Noonan. Over the following months, Noonan traded various tusks, teeth and artefacts with the undercover agents; evidence was then passed on to HM Revenue and Customs (HMRC) officers. Noonan's home was subsequently raided by HMRC officers who found various items which, following examination by experts at the Natural History Museum, were confirmed to be elephants' tusks and whales' teeth; some of these had been fashioned into corkscrews or carved with decorative images. In an attempt to continue trading on eBay, Noonan had illegally obtained a certificate of exemption which he then altered and used.

On 23 November 2009, at Manchester Magistrates' Court, Ching Kun Liu was charged with offering for sale plasters said to contain Leopard *Panthera pardus* (CITES I) products. He was fined GBP1000 (USD662) and GBP100 costs.

In December 2009, at Gloucester Crown Court, Christopher Surfleet was sentenced to 27 weeks' imprisonment suspended for 18 months, and ordered to do 150 hours community service. Surfleet, an auctioneer, sold a client's rhinoceros horn to dealers in the Far East without the client's knowledge. He was also ordered to pay UKP2500 (USD1650) compensation to the client and UKP250 costs.

The horn was part of an assortment of property which the client had brought to the company in which Surfleet worked in November 2007, to be auctioned on her behalf.

On 17 February 2010, Natalija Grinova appeared at Liverpool City Magistrates' Court charged with three offences under COTES relating to the prohibited sale of 34 x 50 g jars of caviar and keeping a further 22 jars of caviar for sale. She pleaded guilty and was fined £350 (USD548) plus £80 costs and a £15 victim surcharge. The 22 caviar jars were also forfeited. The caviar had been imported from Ukraine.

National Wildlife Crime Unit; UK Border Agency (UKBA); *TRAFFIC Bulletin* 20(1):6-7; www.operationcharm.org/news/20090820.jsp, 20 August 2009; HM Revenue & Customs Press Office, 16 October 2009; www.telegraph.co.uk/news/uknews/crime/16790269/PLEASE-PIC-Auctioneer-sold-rhino-horn-for-Chinese-aphrodisiac-market.html, 12 December 2009

AFRICA

More than two tonnes of illegal ivory have been seized and more than 100 people arrested in recent months in the largest-ever transnational operation co-ordinated by INTERPOL targeting wildlife crime across Africa. Codenamed Operation Costa, the series of actions involved officers from police, national wildlife, Customs and national intelligence agencies across six countries—Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda (see also page 146).

Officers in all six countries carried out inspections on shops and markets and checks



ELEPHANT TUSKS AND ITEMS MADE FROM WHALE TEETH WERE OFFERED FOR SALE ILLEGALLY ON EBAY; SOME PIECES HAD BEEN FASHIONED INTO CORKSCREWS OR CARVED WITH DECORATIVE IMAGES.

HMRC

on suspect vehicles at border crossing points. Other wildlife products, in addition to weapons, ammunition and vehicles, were also seized.

"The success of Operation Costa is notable not only for the sheer volume of illegal ivory that has been recovered, which is among the biggest-ever haul recorded, but because it also clearly shows the ability and will of law enforcement to tackle wildlife crime effectively", said Peter Younger, manager of INTERPOL's OASIS Africa (Operational Assistance, Services and Infrastructure Support to African Police Forces) wildlife crime programme.

Supported by INTERPOL's National Central Bureaus and INTERPOL's Regional Bureau in Nairobi, Operation Costa is the second such initiative targeting wildlife crime in Africa co-ordinated by INTERPOL. The first, Operation Baba, was conducted in November 2008 and resulted in the arrests of nearly 60 people and the seizure of one tonne of elephant ivory, following co-ordinated actions in Congo, Ghana, Kenya, Uganda and Zambia (see *TRAFFIC Bulletin* 22(2):75).

INTERPOL media release, 30 November 2009: www.interpol.int/Public/ICPO/PressReleases/PR2009/PR2009113.asp

CAMEROON

On 21 July 2009, two wildlife traffickers were found in illegal possession of two fresh skins of Leopard *Panthera pardus* (CITES I and totally protected in Cameroon). A case file has been established against the dealers in the court in Bafoussam. This action follows an intensification by the West Regional Delegation of Forestry and Wildlife of operations to crack down on wildlife crimes in the region. The West Regional Forces of Law and Order and The Last Great Ape Organization (LAGA) assisted in the operation.

A person was arrested in Bissombo, Bengbis, in the South Region, in possession of a live Chimpanzee *Pan troglodytes* (CITES I), as well as elephant parts and Chimpanzee skulls, some of which were fresh. The animals are suspected to have been captured or killed within the Dja Reserve. The trafficker was gaoled and the live Chimpanzee was taken to Mefou National Park by the Cameroon Wildlife Aid Fund (CWAFF) where it is receiving care.

Before this, a trafficker with a long history of illegal killing of elephants was arrested in possession of elephant parts in the Dja Reserve area in Somalomo, Messamena, in the Upper Nyong Division of the East Region.

The operations that led to these arrests were carried out by the East and South Regional Delegations of Forestry and Wildlife in collaboration with the Forces of Law and Order, the Upper Nyong Divisional Delegation of Forestry and Wildlife and the judiciary, and were in consonance with the nationwide programme on wildlife law enforcement launched by the government in 2003, with technical assistance from local NGO LAGA.

On 16 October 2009, a team of law enforcement officers, including the anti-poaching brigade of the Ministry of Forests and Wildlife (MINFOF), staff from the Direction Générale à la Recherche Extérieure (DGRE) and others, swooped on markets throughout Yaoundé to seize bushmeat illegally on sale.

Codenamed "Coup de poing" (Operation Punch), the team confiscated 45 live animals, 228 carcasses plus 42 assorted animal parts following raids at Nkolndongo and Nkolndongo Texaco markets and the railway station. Three shop owners were arrested. The confiscated animals ranged from parts of gorillas and pythons to monkeys, pangolins, turtles, crocodiles, snakes, antelopes, monitor lizards, hornbills and rodents. The live animals were transferred to Mvog Betsi Zoo, while the confiscated meat was later auctioned off.

According to Celestine Ndonga of DGRE, the area had been identified as important for illegal trade in wildlife products and had been under surveillance for several months leading up to the operation.

TRAFFIC is helping to build the capacity of the Cameroon Government's wildlife monitoring patrols through a project funded by WWF Poland. Elvis Ngolle Ngolle, Minister of Forests and Wildlife, said: "We are pleased with our co-operation with partners TRAFFIC Central Africa and [local NGO] LAGA." "Although sale of some of these species is not prohibited, this activity must be conducted in compliance with existing regulations to control the trade and ensure State revenues, the welfare of communities and the conservation of biodiversity."

On 1 February 2010, police seized more than 1000 Grey Parrots *Psittacus erithacus* (CITES II) at Douala Airport as they were about to be smuggled out of the country to Kuwait and Bahrain. No CITES documentation accompanied the shipment. Many of the parrots were dead; the surviving specimens were delivered to the Limbe Wildlife Center. It is the third major seizure of Grey Parrots in Cameroon in the past two years.

<http://allafrica.com/stories/200908101311.html>, 10 August 2009; *Cameroon Tribune*, 10 August 2009: www.cameroon-tribune.net/article.php?lang=Fr&oled=j31082009&idart=56122&olarch=j10082009, 10 August 2009; <http://allafrica.com/stories/200910010512.html>, 1 October 2009; www.traffic.org/home/2009/10/21/operation-punch-delivers-knockout-blow-to-illegal-bushmeat.html, 21 October 2009; *Pan African Sanctuary Alliance*, 2 February 2010

REPUBLIC OF THE CONGO

On 18 January 2010, four Chinese nationals were arrested for illegally dealing in ivory—the first arrests of Chinese nationals in the country in connection with the trade, according to police sources.

The arrests were made after a raid on premises in central Brazzaville produced a haul of ivory bracelets, statues and other goods.

<http://af.reuters.com/article/topNews/idAFJOE60H0FT200118>, 18 January 2010

ETHIOPIA

On 27 September 2009, a consignment of 637 kg of ivory was intercepted by Ethiopian authorities in Addis Ababa. The consignment had originated from Jomo Kenyatta International Airport, Nairobi, Kenya, destined for Bangkok, Thailand, via Addis Ababa, by the same consignee involved in a seizure of ivory in Kenya on 29 September (see Kenya).

www.kws.org/info/news/2009/01/oct09.html, 1 October 2009; <http://www.interpol.int/Public/EnvironmentalCrime/Wildlife/WorkingGroup/Newsletter60.pdf>

KENYA

On 14 July 2009, wildlife officials seized more than 300 kg of illegal ivory and two Black Rhinoceros *Diceros bicornis* (CITES I) horns from a cargo plane in transit from Mozambique, bound for Lao PDR via Thailand.

Blood on some of the 16 elephant tusks and the rhinoceros horns suggested the animals had been recently killed. The contraband, whose provenance was unclear, was concealed in coffin-shaped wooden boxes.

On 29 September 2009, at Jomo Kenyatta International Airport, Nairobi, Kenya Wildlife Service law enforcement officers, in liaison with Kenya Airways, Ethiopian Airlines, Lusaka Task Force and airport police, impounded 61 whole tusks of raw ivory (CITES I) (532 kg). The trophies were discovered in the Kenya Airways warehouse and were to be air freighted to Bangkok, Thailand, via Addis Ababa, Ethiopia. (see Ethiopia).

Wildlife rangers arrested 12 men involved in an illicit game trade syndicate suspected of killing a female White Rhinoceros *Ceratotherium simum* (CITES I) at a private ranch on 28 December 2009, and removing its horns. The horns were recovered. The suspects were to be arraigned before a court in Nairobi's Kibera district.

http://news.yahoo.com/s/ap/20090714/ap_on_re_af/af_kenya_illegal_ivory, 14 July 2009; www.timeslive.co.za/news/africa/article248538.ece?service=print; www.kws.org/info/news/2009/01/oct09.html, 1 October 2009; www.interpol.int/Public/EnvironmentalCrime/Wildlife/WorkingGroup/Newsletter60.pdf

SOUTH AFRICA

In July 2009, at Grahamstown Magistrates' Court, Mbulelo Mgxoteni and Thembele Msila, both of Port Elizabeth, pleaded guilty and were charged in connection with the theft of elephant tusks from Kwandwe Game Reserve. They were each gaoled for a year, suspended for three years, and sentenced to a fine of R9000 (USD1200) or 18 months in prison. Two thirds of the fine was suspended.

Msila, a former employee at the reserve, and his uncle Mgxoteni, tried to get information on elephant tusks from a reserve worker who subsequently tipped off management who, in turn, alerted the police. A trap was set: two elephant tusks were left in an office on the reserve to which Msila and Mgxoteni had obtained a key. After breaking in and stealing the tusks, the pair was stopped at the gates of the reserve as they were leaving.

The apparent light sentence was attributed to various factors, including the fact that the pair were first time offenders and that no animals had been killed.

On 24 July 2009, Vaughan Corlett was found guilty of being in possession of specially protected plants without permits following the seizure of 268 cycad plants at his property. He was sentenced on 7 August 2009, at Randburg Magistrates' Court, Gauteng, to a fine of



GDACE

STEMS OF CYCAD *ENCEPHALARTOS LAEVIFOLIUS* (CITES I) FOUND ON A PROPERTY IN GAUTENG PROVINCE, SOUTH AFRICA.

R500 000 (USD68 000) or imprisonment for four years, plus two years' imprisonment, suspended for five years. This is believed to be the first sentence of its kind in South Africa for the illegal trade in cycads.

The investigation began in late February 2007 when the Organized Crime Unit of the South African Police Service (SAPS) in Johannesburg was asked to assist with an investigation regarding the possible possession of indigenous cycads *Encephalartos* at a smallholding owned by the defendant in Honeydew. The property was visited on 1 March 2007 where a large number of indigenous cycad plants were found planted in the ground and in pots or plastic bags. Fourteen cycad *Encephalartos laevifolius* stems were found. Suspicions were aroused as the species originates from a nature reserve in Mpumalanga and the stems of these specimens had no leaves and their roots were badly damaged and cut off from the stem; furthermore, their stems were covered with old burn marks caused by veld fires that are common to plants from the wild.

With the assistance of the forensic laboratory of SAPS and officers from Mpumalanga Parks Agencies based in Nelspruit, the 268 plants were found to include 18 plants (four of which were microchipped) that were positively identified as stolen from nature reserves in Mpumalanga. The 14 *E. laevifolius* specimens were linked to their natural habitat with soil and rock samples collected by the SAPS forensic laboratory. One of the stolen microchipped plants found in the possession of Mr Corlett was identified as *Encephalartos heenanii*, which was one metre in length.

Microchips are implanted into rare cycad plants in their natural habitat to make it possible to track them down should they be found in private possession.

The suspect was charged with possession of stolen goods, possession of specially protected plants without permits, and receipt, possession, acquisition or handling of protected plants in accordance with the *Gauteng Nature Conservation Ordinance 12 of 1983*.

All of the cycad plants were forfeited to the State. Plants taken from Mpumalanga were to be returned and the remainder handed over to Walter Sisulu National Botanical Garden.

On 31 July 2009, at Bellville Specialized Commercial Crime Court, Kiyaam Rinqest was gaoled for 32 years. Rinqest had been found guilty of receiving drugs worth millions of rands as payment for illegal abalone *Haliotis* exports to the Far East.

He was found guilty on 10 of the 23 charges—two of dealing in drugs, two of possession of abalone, two involving the possession of abalone-processing equipment, one concerning the illegal use of the proceeds of crime and three of car theft.

By poaching undersized abalone, in addition to removing abalone without a permit, Rinqest had "aggravated an already desperate situation", the judge said. He said there was also a connection between abalone poaching and the trade in drugs, which were used as payment for illegally collected abalones.

On 7 August 2009, Eastern Cape police seized two tonnes of abalones *Haliotis* and arrested a Port Elizabeth man after seeing abalone in his pick-up truck. After following the vehicle to the suburb of Collenglen, police uncovered the goods from the vehicle and the man's property.

The previous day, another person from Port Elizabeth was arrested when police, acting on information, found three tonnes of abalones at his house in Greenbushes.

On 20 August 2009, two men were arrested for allegedly poaching rhinoceroses at a game reserve between Ulundi and Melmoth, managed by Ezemvelo KwaZulu-Natal Wildlife. The arrests follow a reported spate of rhinoceros poaching incidents in the reserve. Weapons and ammunition were confiscated.

On 23 October 2009, two men were arrested by police following a search of a property in Louterwater, Uitenhage, Eastern Cape, which uncovered 121 kg of abalones *Haliotis* (and

drugs and firearms). The pair was to appear in court at a later date.

The Herald (South Africa), 14 December 2009; *Gauteng Nature Conservation: Projects Resource Protection*; www.the-times.co.za/News/Article.aspx?id=1042801, 31 July 2009 www.int.iol.co.za/index.php?set_id=1&click_id=15&art_id=nw20090807170312621C266509, 7 August 2009; www.iol.co.za/index.php?set_id=1&click_id=15&art_id=nw20090824182106241C675711, August 24 2009; www.weekendpost.co.za/article.aspx?id=489114

TANZANIA

On 21 July 2009, at Dar es Salaam's Magistrates' Court, six Tanzanian businessmen were charged with smuggling 11 t of elephant ivory to the Philippines and Viet Nam between October 2008 and March 2009. They were also charged with 11 counts of conspiracy, unlawful hunting, exporting concealed and undeclared items, as well as making false documents. The men, who denied the charges and were remanded in custody until 28 July pending bail application, run several export and cargo clearing firms in Dar es Salaam. The tusks were impounded by authorities in the Philippines and Viet Nam through co-operation with INTERPOL (see also Viet Nam).

An anti-poaching operation involving police officers and wildlife rangers has resulted in the arrest of poachers and the seizure of more than 100 kg of ivory (and weapons). The operation, codenamed Operation Kipepeo—or Operation Butterfly—owing to the use of helicopters with infantry support to scan poachers in the Selous Game Reserve, resulted in the arrest of 70 poachers in the first week of operation. The government subsequently announced an award of USD1 000 for information leading to the arrest of poachers. Eight cases have been filed in connection with the operation: at least four are at the hearing stage and involve individuals in possession of over 800 kg of ivory.

www.google.com/hostednews/afp/article/ALeqM5gQykXh;pfORKfQj66ccc3e2vSiv, 21 July 2009; *TRAFFIC East/Southern Africa*

ZIMBABWE

On 11 January 2010, at Masvingo Magistrates' Court, Victoria Tendai Mutyairi of Masvingo was sentenced to 17 years' imprisonment for poaching a rhinoceros at Matendere Range. The sentence was suspended for 10 years on condition that USD120 000 in restitution was paid to the State.

Mutyairi and two cousins went to Matendere Range with the intention of poaching rhinoceroses. The trio killed one rhinoceros and wounded another, which managed to escape. The horn of the dead rhinoceros had been removed.

The suspects were intercepted by a team from the police and the Parks and Wildlife Management Authority. Mutyairi was shot in the abdomen after an exchange of gunfire with the police. The other two escaped.

"This sentence is a welcome move that will work as a deterrent to would-be offenders. In the past, most poachers were getting away with lighter sentences such as fines and community services," said Parks and Wildlife Management Authority public relations manager Caroline

Washaya-Moyo. She added that the sentencing was a culmination of efforts made by the Authority to curb poaching across the country.

On 6 December 2009, two South Africans and a Mozambican were arrested in Springs for the possession of illegal ivory. The men were travelling in a vehicle when they were stopped by police. The three were to appear in Springs Magistrates' Court on 8 December. No update was available.

<http://allafrica.com/stories/201001150219.html>,
15 January 2010; www.iol.co.za, 7 December 2009

MIDDLE EAST

UNITED ARAB EMIRATES

The Dubai Municipality has seized animal skins during an inspection of various veterinary establishments and antique shops, including those of four Pythons *Pythonidae* (CITES I/II) and two Nile Crocodiles *Crocodylus niloticus* (I/II). The skins were up to nine metres in length.

Eng. Hashim Al Awadhi, Head of the Veterinary Services Section, said the Section plays an important role in implementing the terms of CITES in regulating the international trade of flora and fauna that are at risk of extinction. He said that the Veterinary Services Section takes extra efforts to educate the public and those who work in pet shops and shops that sell souvenirs on the provisions of CITES, endangered animals, the purpose of protecting these animals and organizing their trade through the provision of CITES certificates.

Emirates News Agency, 28 September 2009

ASIA

EAST ASIA CHINA

On 8 June 2009, the Yunnan Honghe forest police seized two Common Water Monitors *Varanus salvator* (CITES II) and one Burmese Python *Python molurus* (II) from a minibus travelling from Honghe to Kaiyuan, Yunnan Province. The following day, the police discovered 88 skins of Leopard Cats *Prionailurus bengalensis* (II) and some cobras on the premises of two people, who were detained. The case is under investigation.

On 7 July 2009, Shantou Customs reported that a gang leader had been sentenced to life imprisonment by the Middle People's Court of Shanwei, Guangdong Province, following a charge of involvement in the smuggling of 2023 frozen pangolins *Manis* (CITES II), 153 kg of frozen pangolin viscera, 800 kg of pangolin scales, 732 live Monocellate Cobras *Naja kaouthia* (II), 3904 live rat snakes, 363 frozen civet cats and 32 292 dried Chinese Rat Snakes *Ptyas korros*. The man's personal property was also confiscated. Six others involved received suspended gaol terms of between three and 15 years.

On 9 July 2009, traffic police at the Guang-Jing highway of Taizhou, Jiangsu Province, discovered 24 paws of Asiatic Black Bears *Ursus thibetanus* (CITES I), 11 Common Monitors *Varanus bengalensis* (I), seven Chinese Giant Salamanders *Andrias davidianus* (I), six Monocellate Cobras *Naja kaouthia* (II) and two Hundred-pace Snakes *Deinagkistrodon acutus* in a vehicle travelling from Wenzhou, Zhejiang Province, to Jinan, Shandong Province. All the live lizards and snakes were sent to Nanjing Hongshan Forest Zoo. The driver was detained and the case is under investigation.

On 15 July 2009, Guangzhou Customs officials seized 1 194 kg of frozen pangolins *Manis* (CITES II) and 602 kg of dried rat snake skins at a gravel dock of the Pearl River Estuary.

On 25 July 2009, Fangchenggang traffic police in Guangxi Province seized 39 live pangolins *Manis* (CITES II) from a car; the passengers fled. All the animals were transferred to the local wildlife conservation department.

On 6 August 2009, Customs officials in Gongbei, Zhuhai City, Guangdong Province, seized a total of 47 kg of Agarwood *Aquilaria sinensis* (CITES II/National Grade 2 Specially Protected) from two mainland travellers who tried to clear Customs in possession of the undeclared fragrant wood.

On 18 August 2009, police in Fangchenggang city, Guangxi Province, arrested two people and confiscated 39 live pangolins *Manis* (CITES II) from a local garage. All the animals were transferred to the forestry department. The case is under investigation.

On 7 September 2009, policemen from the Nantou checkpoint of Shenzhen city found 12 Slow Lorises *Nycticebus coucang* (a species listed under national first-class protection/CITES I) in a coach travelling from Nanning, Guangxi Province. In addition, 18 live pangolins *Manis* (II) were seized from a car. Two suspects were detained and all animals were sent to the local safari park.

On 12 September 2009, Lincang traffic police, Yunnan Province, found an employee of a local construction company illegally transporting two Asiatic Black Bear *Ursus thibetanus* (CITES I) paws. The suspect claimed he had planned to give the animal parts as a gift. He was detained and the vehicle was impounded.

On 19 October 2009, Gengma forest police of Lincang, Yunnan Province, seized from two apartments eight bear paws, one bear penis, one bear gall bladder, the skin of one Leopard *Panthera pardus* (CITES I), three Serow *Naemorhedus sumatraensis* (I) horns, and other animal products. The suspects claimed that the items had been smuggled from Myanmar via Yonghe port of Cangyuan county.

On 19 October 2009, after five months of careful investigation, Hengyang Forest police, Hunan Province, seized 24 live pangolins *Manis* (CITES II), and arrested three suspects. The animals had been transported from south-west China and were thought to be bound for Guangdong Province. The animals were sent to

the local wildlife rescue centre and the suspects were detained.

On 13 November 2009, Yongping forest police of Dali, Yunnan Province, seized 23 paws of Asiatic Black Bear *Ursus thibetanus* (CITES I) (147.5 kg) from a vehicle on the 320 State road. The suspect was detained and the seizure was to be investigated.

On 23 November 2009, in a Beijing coach station, two bear paws and three frozen pangolins *Manis* (CITES II) were found in a coach arriving from Shanghai. The delivery man, a native of Guangdong Province, claimed that he had purchased the items via the internet.

In December 2009, a court in Xishuangbanna, Yunnan Province, sentenced Kang Wannian to 12 years in gaol for killing an Indochinese Tiger *Panthera tigris corbetti* (CITES I) in southwestern China. He was also ordered to pay a fine of CNY100 000 (USD14 600), plus CNY480 000 for State economic losses.

Kang said he shot the animal after dark and did not know it was an endangered Indochinese Tiger. The incident took place in February 2009, and Kang surrendered to police in June.

Fewer than 10 specimens of this subspecies are distributed in the south of Yunnan Province, which borders Myanmar.

On 21 December 2009, Luohu Customs officials at Shenzhen, Guangdong Province, detected 17 pieces of animal bones on the x-ray of a carton in the possession of a Chinese national. The items were identified by the South China Endangered Animal Institute as Tiger bone. The suspect claimed that the bones had been purchased in Malaysia and were to be used to treat his rheumatism. The case has been transferred to the local anti-smuggling department for further investigation.

In an earlier incident, in June 2009, Luohu Customs officials seized 70 Tiger bones (2.2 kg). It is reported that some 20 kg of ivory and two kilogrammes of Saiga Antelope *Saiga tatarica* (CITES II) were among wildlife items seized by Luohu Customs during 2009.

On 13 January 2010, the Tengchong branch of Kunming Customs seized 946 g of rhinoceros horn from a vehicle. Two suspects claimed that they had purchased the horn in Myanmar and had smuggled it through the border. The case is under investigation.



AGARWOOD *AQUILARIA SINENSIS* SEIZED BY CUSTOMS OFFICIALS IN GONGBEI, ZHUHAI CITY, GUANGDONG PROVINCE, CHINA.

LIU CONGXIN

In a separate incident, on 8 July 2009, a resident in Gifu was arrested for illegally selling seven Luzon Peacock Swallowtails between February 2008 and March 2009.

On 14 October 2009, the Consumer and Environmental Protection Division of Tokyo Metropolitan Police Department, Ikebukuro Police Station and Ikegami Police Station arrested a man for illegally importing Luzon Peacock Swallowtails *Papilio chikae* (CITES I) in violation of *Foreign Exchange* and *Foreign Trade* laws.

On 23 October, the file on a further four men was sent to the Tokyo District Public Prosecutors' Office.

The five men took part in a tour to collect *Papilio chikae* in Luzon, Philippines. They left the Philippines on 28 March with a total of 40 butterflies in their possession.

The suspect who had planned the tour is a collector and had allegedly run similar collection tours in August 2008 and August 2009.

Asahi Shimbun, 8/25 July 2009; *Yomiuri Shimbun*, 8/19 July, 24 October 2009; *Mainichi Shimbun*, 8/19 July, 23 October 2009; *Hokkaido Shimbun*, 8 July 2009; *Chunichi Shimbun*, 8 July 2009; *Sankei Shimbun*, 9/24 July 2009; *Kyodo Press*, 8 July 2009; *NHK News*, 8 July 2009; *Sankei News*, 23 October, *TRAFFIC East Asia-Japan*

TAIWAN

On 9 July 2009, at Kaohsiung Airport, authorities seized a Ploughshare Tortoise *Astrochelys yniphora* (CITES I) that was found concealed in the luggage of a businessman returning from China. The case is under investigation.

On 18 July 2009, Customs officials seized 231 Chinese Box Turtles *Cuora flavomarginata* (CITES II) from the freezer of a vessel flying a Hong Kong flag. The suspect, an Indonesian national crew member, said that he planned to sell the reptiles in Hong Kong.

On 29 August 2009, Kaohsiung Customs officials detected 1255 Chinese Box Turtles concealed in export cargo declared as Chinese Striped-necked Turtles *Ocadia* [*Mauremys*] *sinensis*, destined for Hong Kong.

On 22 July 2009, Customs officials at Kaohsiung Airport found two Ploughshare Tortoises *Astrochelys yniphora*, 12 Radiated Tortoises *Astrochelys radiata* and seven Black Pond Turtles *Geoclemys hamiltonii* (all CITES I species) hidden inside a pile of boxes arriving on a cargo flight from Hong Kong. The reptiles were to be sent to a rescue centre in Taipei Zoo. The case is under investigation for violation of the *Wildlife Conservation Act*.

On 23 September 2009, Keelung Customs Office (KCO) discovered 16 undeclared ivory (CITES I) carvings in unaccompanied baggage shipped from the Netherlands.

On 2 October 2009, a man from Shenzhen, China, was detained at Kaohsiung Airport after being found with six live Chinese Hwameis *Garrulax canorus* (CITES II) concealed in wooden boxes in luggage. The birds were first detected by a newly trained sniffer dog. The suspect may be charged with violation of quarantine regulations and the *Wildlife Conservation Act*.

On 11 November 2009, at Taipei Airport, Customs officials seized 27 Radiated Tortoises *Astrochelys radiata* (CITES I) and 30 Leopard Tortoises *Stigmochelys pardalis* (II) that had been concealed in personal luggage arriving on a flight from Macau. Importation of Leopard Tortoises to Taiwan is prohibited as the species is a carrier of heartwater disease. The tortoises were confiscated and the suspect was to be charged with violation of the *Wildlife Conservation Act*.

On 20 November 2009, a man arriving on a flight from Macau was caught at Taipei Airport with eight Radiated Tortoises *Astrochelys radiata* (CITES I), 22 Leopard Tortoises *Stigmochelys pardalis* (II) and 116 songbirds of 13 species. He claimed that these animals were bought in Zhuhai, Guangdong Province, China.

On 19 December 2009, a man arriving from Myanmar was caught at Taipei Airport with one rhino (CITES I) horn (one kilogramme) concealed in his luggage.

[www.gov.tw/\(A\(6Pe0RhE4ygEkaAAAAMzVjZWU3ZWltODkzYy00N2QwLWFjNjltYzYwMwYTY3M2YwYzE00\)\)/NewsCenter/Pages/detail.aspx?page=5d3e678c-43cd-440b-b85d-078293f3e07c.aspx&AreaName=21488_21271_&SpXAutoDetectCookieSupport=1](http://www.gov.tw/(A(6Pe0RhE4ygEkaAAAAMzVjZWU3ZWltODkzYy00N2QwLWFjNjltYzYwMwYTY3M2YwYzE00))/NewsCenter/Pages/detail.aspx?page=5d3e678c-43cd-440b-b85d-078293f3e07c.aspx&AreaName=21488_21271_&SpXAutoDetectCookieSupport=1); <http://udn.com/NEWS/SOCIETY/BREAKINGNEWS2/5028950.shtml>; <http://www.nownews.com/2009/08/31/320-2499503.htm>; <http://udn.com/NEWS/SOCIETY/SOC4/5110075.shtml>; www.cdnews.com.tw/cdnews_site/docDetail.jsp?coluid=112&docid=100844101; *The China Post*, 24 September 2009; www.chinapost.com.tw/taiwan/local/taipei/2009/09/24/225936/KCO-seizes.htm; <http://udn.com/news/society/breakingnews/2/5177203.shtml>; <http://taipei.customs.gov.tw/ct.asp?xitem=43988&ctNode=7306>; <http://news.chinatimes.com/2007/Cti/2007/Cti-News/2007/Cti-News-Content/0,4521,11050303+132009112100542,00.html>; www.udn.com/2009/11/22/news/society/breakingnews2/5323549.shtml

SOUTH ASIA INDIA

On 18 June 2009, at Katni courts, Madhya Pradesh, a Tiger poacher well known to the authorities was sentenced to three years' rigorous imprisonment and fined Rs.10 000



APOLLO BUTTERFLY *PARNASSIUS APOLLO* (TOP) AND HOMERUS SWALLOWTAIL *PAPILIO HOMERUS* (BELOW).



SPECIMENS OF BOTH SPECIES WERE ILLEGALLY IMPORTED INTO JAPAN.

(USD214). The person, called Dariya (and not to be confused with another Tiger poacher with this name who was arrested in April 2008), had been arrested by the Katni Forest Division. In his possession were spring traps to catch Tigers *Panthera tigris* (CITES I) and Leopards *P. pardus* (I), skin and antlers of a Chital *Axis axis*, a spear and other poaching equipment. Leopard hairs had been identified on one of the traps by forensic experts. This is a unique judgement where conviction has been granted on the seizure of spring traps.

The defendant had previously been booked in four separate cases involving the poaching of Tigers and Leopards in Uttar Pradesh (UP) and Bihar. In July 2000, two Leopard skins were seized from his residence by police in Pinjore, Haryana. In November 2005, he was arrested again at Katerniaghat, Dudhwa Tiger Reserve, with poaching equipment and served a five-and-a-half-month gaol term in Bahraich, UP. After being released, he was an accused in a case involving the seizure of a fresh Tiger skin in December 2006 on the Indo-Nepal border. On this occasion, he absconded and it is expected that he will now be taken to Bihar to stand trial.

On 24 July 2009, a team comprising staff of Ranthambore Tiger Reserve, Sawai Madhopur District of Rajasthan State, and a representative of an NGO—the Wildlife Protection Society of India (WPSI)—arrested three poachers at Dumariya village in Bharatpur District. All belong to the Mogiya community.

One of those detained is a well-known Tiger poacher who has been operating in Ranthambore and Sariska Tiger Reserves for several years. He is believed to have been an accomplice in two Tiger poaching incidents in Ranthambore, in 1992 and 2001, and a further two in 2002. He absconded in all cases.

On 26 July 2009, three Leopard *Panthera pardus* (CITES I) skins were seized by the Uttarakhand Forest Department from a hotel at Birhi, near Chamoli. One person was arrested and three people absconded. The Leopards are believed to have been killed in the Nizmulah valley.

The previous day, the remains of an Asiatic Black Bear *Ursus thibetanus* (CITES I) were found in the Bhadrinath Forest Division; the animal's gall bladder and fat had been removed.

In the first six months of 2009, it is reported that at least 16 Leopard skins were seized in the State of Uttarakhand.

On 31 July 2009, a Nepali citizen was arrested by Sashastra Seema Bal (SSB) paramilitary officials at Dandahead in Sonauli, along the border with Nepal, in possession of one Tiger *Panthera tigris* (CITES I) skin, five Tiger nails and some Tiger bones.

On 2 August 2009, SSB officials acting on information arrested a further two Nepali citizens in Sonauli in possession of Tiger meat and a Tiger nail. The pair was travelling on a Nepali tourist bus coming from Delhi. The case is under investigation.

On 3 September 2009, police in Bhavnagar, Gujarat, arrested a man in possession of 98 kg of ivory at Randhanpuri market (items included tusks weighing around three kilogrammes, ivory ornaments, bangles and 87 kg of raw ivory).

The suspect's forefathers were craftsmen who made ivory ornaments under licence from the government. They had a shop in the Randhanpuri market in the city. Following the ivory trade ban, their licences were cancelled, but the family had allegedly continued to make and sell ornaments illegally.

On 16 September 2009, Assam Rifles personnel seized 25 kg of horns of the Great Indian Rhinoceros *Rhinoceros unicornis* (CITES I), 5.5 kg of rhinoceros skins and bones; 10 gall bladders of the Asiatic Black Bear *Ursus thibetanus* (I) and 482 kg of pangolin *Manis* (II) scales from two persons at Tengnoupal near Manipur's Moreh town in Chandel district bordering Myanmar.

Poachers generally take away the horn and leave behind the carcass after killing a rhinoceros. But the present haul hints at a departure, said a wildlife crime expert. "If rhino bones and skin are being smuggled, then it gives a completely new dimension to the illegal wildlife trade in the north-eastern region," he added. Assam holds two-thirds of the world's Great Indian Rhinoceros population and the animals are frequently poached for their horns, which are smuggled mostly through the Myanmar border into China and South-east Asia for use in traditional Chinese medicine.

Both persons, along with the seized items, were handed over to the Manipur forest office at Pallel. Forensic tests would be carried out to confirm the source of the horns.

The porous India-Myanmar international border near Moreh is said to be one of the major conduits for smuggling wildlife parts.

On 16 September 2009, a crime branch squad arrested two people in Chhattisgarh's Kanker district while they were allegedly waiting to sell the 1.5 m skin of a Leopard *Panthera pardus* (CITES I) to a customer. The skin bore bullet marks. Police have been interrogating the men in a bid to unravel an interstate animal poachers' gang which they believe has been in operation for several years.

On 19 September 2009, a group of three poachers shot and killed a Great Indian Rhinoceros *Rhinoceros unicornis* (CITES I) in the Burapahar Range of Kaziranga National Park (KNP), Assam, and removed its horn. The poachers were arrested on 24 September by foresters and handed over to the police. The horn was misplaced by the poachers during an exchange of gunfire with forest guards, and a search was under way to retrieve it.

On 22 December 2009, it was reported that two Great Indian Rhinoceroses were killed in separate incidents by poachers at the park; the horns had been removed.

On 19 September, a Royal Bengal Tiger in the park also died of suspected poisoning, reportedly a new method adopted by poachers, and a male elephant migrating out of the park was shot by poachers on 17 September.

Forest rangers complain about poor infrastructure and obsolete weapons compared to the sophisticated assault rifles used by poachers.

The Central Bureau of Investigation (CBI) arrested two persons accused of being responsible for the majority of Tiger poaching

at Sariska Tiger Reserve, Rajasthan, and on whose trail the authorities have been for the past five years. They were apprehended in Bathinda, Punjab.

In early October 2009, the Wildlife Crime Control Bureau (WCCB) and State forest department officials seized wildlife items from various locations: on 10 October, an operation, jointly conducted by the WCCB and the Uttarakhand Special Task Force, led to the arrest of two people in Vikasnagar near Dehrudun. The skins of two Leopards *Panthera pardus* (CITES I) and the gall bladder of a Sloth Bear *Melursus ursinus* (I) were recovered. Three poachers were arrested in Panna Tiger Reserve, Madhya Pradesh, in possession of iron traps.

In Matheran, the WCCB seized 72 monitor lizard skins, four purses made of cobra skins and 29 wallets, suspected to be made of skins of protected reptiles, all being offered as tourist curios.

On 31 October 2009, forest guards in Orang National Park, Assam, killed two poachers who had killed a female Great Indian Rhinoceros *Rhinoceros unicornis* (CITES I) and removed its horn. Two others escaped. One of the deceased, identified as Hormuz Ali, had carried a price on his head. He had earlier been caught but released after serving three months in gaol.

The poachers, officials said, had struck during Diwali festivities hoping that the sound of gun shots would be masked by the din of crackers.

The rhinoceros horn was recovered, together with an axe and cartridges.

Two Tibetans arrested at a refugee camp at Manju Ka Tilla in Delhi are believed to have played a pivotal role in what has been identified as an international smuggling syndicate believed to be routing wildlife products through China to Tibet. Items uncovered during raids in Nagpur and Delhi included skins of two Tigers *Panthera tigris* (CITES I) and two Leopards *P. pardus* (I), more than 50 kg of bones, as well as Red Sandalwood *Pterocarpus santalinus* (II). A number of others have been taken into custody and more arrests are expected.

On 22 November 2009, troops of the 42 Assam Rifles apprehended three persons and confiscated 365 pangolin *Manis* (CITES II) scales, as well as banned drugs and arms and ammunition from the vehicle in which they were travelling in Lamkhang, Chandel district.

On 22/23 November 2009, police officers in the Leh district of eastern Ladakh seized 75 kg of *Cardyrops sinenses*, a fungus which parasitizes the larvae of a moth of the genus *Thitarodes*. Five persons were arrested as they tried to cross the Mahey bridge, 80 km from the Sino-Indian border. The items had been brought to Leh from Delhi by cargo courier, labelled as noodles and blankets. The kingpin of the operation is being sought.

The fungus is commonly known as "caterpillar mushroom" and is widely used in Chinese medicine for curing hypertension, cancer and impotency. It is considered a unique example of the symbiotic relationship between

flora and fauna: the fungus kills the insect and occupies the body's cavity. In spring, the fungus sends out a stalk from its dead host to release spores which go on to infect other caterpillars.

On 26 November 2009, at Bansbari, Assam, six poachers surrendered during a ceremony organized by TRAFFIC India.

The poachers turned themselves in to Bodo Territorial Council (BTC) with three deer antlers and two deer skins along with firearms, traps and nets in their possession. The poachers operated in and around Manas National Park and most were known to be active in the region. Between them they are said to have killed two Tigers *Panthera tigris* (CITES I), a Great Indian Rhinoceros *Rhinoceros unicornis* (I) and three Asian Elephants *Elephas maximus* (I) in recent years.

Their surrender is a boost to conservation efforts in the region, where poaching is commonplace. In October 2009, three poachers were arrested, based on information provided to the Forest Department through an intelligence network established by TRAFFIC India. Two poachers were shot dead in Orang the same month.

Earlier, the apprehended individuals had indicated that poachers active in Kaziranga, Orang, Pobitaro and Manas were interested in changing their ways and surrendering if support for an alternative source of livelihood could be provided. This led to co-operation between TRAFFIC India and BTC to identify the relevant individuals, resulting in the recent surrender.

Sh. Khampha Bargayari, Deputy Chief of BTC said at the surrender ceremony "In the coming year, BTC plans to budget a rehabilitation programme for the surrendered poachers where they will be provided with employment at dairy farms and co-operative stores set up by BTC."

Mr Samir Sinha, Head of TRAFFIC India said, "We are hopeful that the surrender of these poachers will set a positive example for all others operating in the area. This is surely a step ahead in our mission to curb illegal wildlife trade. TRAFFIC India and WWF-India have been working with the Assam Forest Department on various conservation issues in the past and we hope our association with the department will help make significant contributions towards conservation of species in the wild."

On 1 December 2009, police acting on information arrested four persons in Kochi for attempting to sell two pieces of ivory weighing nearly 25 kg. The suspects were approached by police officials acting as prospective buyers. A deal was struck before the accused were arrested. Another individual is being sought.

On 1 January 2010, three men were arrested by forestry personnel in Venamani, Kozhikode, in possession of a Tiger *Panthera tigris* (CITES I) skin bearing a bullet mark.

On 11 January 2010, a court in Delhi convicted a man accused of trading in shahtoosh shawls. Mohammed Ishaq Baig was found to be in possession of the shawls following a raid at his house in March 1999. Of the 159 items

recovered from his possession, 10 were confirmed to be made of shahtoosh, the wool of Tibetan Antelope *Pantholops hodgsonii* (CITES I). Baig was sentenced to one year's imprisonment and fined INR5000 (USD108).

On 12 January 2010, and based on specific information provided by TRAFFIC India, army personnel and forest guards sealed a 15 km stretch along the Rajiv Gandhi Orang National Park to apprehend a group of poachers who had shot dead a Great Indian Rhinoceros *Rhinoceros unicornis* (CITES I) near Amulya anti-poaching camp, and removed the horn. Four alleged poachers who were armed with weapons and ammunition, were apprehended. Sources said the group of poachers had entered the park from the Lahori or the Horujan *chapories* in the Brahmaputra.

<http://timesofindia.indiatimes.com/home/environment/flora-fauna/Tiger-poacher-convicted-in-Madhya-Pradesh/articleshow/4672818.cms>, 18 June 2009; <http://india.today.intoday.in/site/Story/5338/LATEST%20headlines/Ranthambhore+and+Sariska+tiger+poachers+arrested.html>, 24 July 2009; [www.wpsi-india.org/news](http://wpsi-india.org/news), 24 July 2009; <http://indiatoday.intoday.in/site/Story/53917/LATEST%20HEADLINES13+leopards+poached+in+Uttarakhand.html>, 28 July 2009; http://in.jagran.yahoo.com/news/local/uttar-pradesh/4_1_5672158.html, 31 July 2009; <http://news.chennaionline.com/newsitem.aspx?NEWSID=2a0849a1-c0ed-4e02-900e-a9ad7fbaeae&CATEGORYNAME=NATL>; Hindi Newspaper, *Dainik Jaagaran*, 2 August 2009; *Press Trust of India*, 3 September 2009; www.ptinews.com/news/264098_Man-held-with-over-97-kg-ivory-in-Bhavnagar, *Times of India*, 16 September 2009; <http://timesofindia.indiatimes.com/articleshow/15019936.prt?page=1.cms>; *Indo Asian News Service*, 17 September 2009; <http://india-forums.com/news/article.asp?id=199084>; <http://economictimes.indiatimes.com/Environment/Male-rhino-killed-in-Kaziranga/articleshow/5037706.cms>, 21 September 2009; *Times of India*, 25 September 2009; <http://timesofindia.indiatimes.com/newsindia/Three-Rhino-poachers-held-in-Assam/articleshow/5052438.cms>; *The Indian Express* (New Delhi), 11 October 2009; www.indianexpress.com/news/poaching-racket-in-panna-exposed/5297621; www.hindustantimes.com/StoryPage/Print/466539.aspx, 18 October 2009; <http://timesofindia.indiatimes.com/city/nagpur/Tibetans-arrested-in-poaching-case-link-traced-to-China/articleshow/5207630.cms>, 8 November 2009; www.morungexpress.com/regional/38140.html; www.tribuneindia.com/2009/20091126j&k.htm, 25 November 2009; *TRAFFIC Bulletin* 20(3):92; www.traffic.org/home/2009/11/24/traffic-india-helps-poachers-surrender.html; *The Hindu*, 2 December 2009; www.hindustantimes.com/rssfeed/assam/Poachers-kill-two-rhinos-in-Kaziranga/Article1-489189.aspx, 22 December 2009; www.thehindu.com/2010/01/02/stories/201001025780300.htm; *Indian Express*, 12 January 2010; www.indianexpress.com/news/around-town/56631012; www.telegraphindia.com/1100112/jsp/northeast/story_11970123.jsp; 11 January 2010; *TRAFFIC India*

Seizures in India including Red Sandalwood:

Red Sandalwood *Pterocarpus santalinus* is a CITES Appendix-II species, and in India is also protected under *Red Sanders and Sandalwood Transit Rules of the Andhra Pradesh Forest Act, 1967*. According to *The IUCN Red List of Threatened Species*, *Red Sandalwood* is *Endangered* and is restricted to the southern parts of the *Eastern Ghats* (IUCN, 2009).

On 22 June 2009, Assam Rifle troops seized 20 t of Red Sandalwood and a number of vehicles at Bonyang checkpost, as well as other

wildlife products including 580 pangolin *Manis* (CITES II) shells, from a vehicle travelling along the Imphal-Moreh road. All items were handed over to the Forest Department.

Investigating agencies in India have tracked a major international racket reportedly involved in the smuggling of Red Sandalwood from Andhra Pradesh to China through the Moreh border.

The Directorate of Revenue Intelligence near Aizawl intercepted a consignment of around 2000 logs in October 2009. At the same time, six Chinese nationals were apprehended from a retired police officer's residence in Aizawl, where the consignment had been hidden. Three of the individuals did not have a visa or papers; the others did not have a permit to enter Mizoram. They were, however, released without any action being taken.

Since August 2009, at least 100 t of Red Sandalwood has been seized in Manipur and Mizoram. Six hundred tonnes of wood were in transit in Dhubri and Burdawan, where it was seized by the forest department.

B.B. Dhar, Chief Conservator of Forests (Vigilance), Assam, states that the wood is smuggled out of India mainly through Manipur and Mizoram and that a smuggling racket is operating. It is reported that the wood has no known use in India but is used internationally in the making of Japanese musical instruments and Chinese medicine.

It is reportedly the first time that the Aizawl-Chemphai route has been used to smuggle Red Sandalwood, possibly owing to greater vigilance on the Moreh route.

On 10 November 2009, officials of the Directorate of Revenue Intelligence (DRI) claimed to have detected a major smuggling racket in the city, following the seizure of 32 t of Red Sandalwood from the container terminal at Chennai port. Two licensed clearing agents, alleged to be behind the scheme, were arrested.

On 22 December 2009, Directorate of Revenue Officials reported what is probably north India's biggest seizure of Red Sandalwood. A total of over 36 t (10.72 t from Ludhiana and 25.8 t from Delhi), was seized, together with nearly five tonnes of Organ-pipe Corals *Tubipora musica* (CITES II) from import and export containers. Five men were arrested.

The export container held 10.72 t of Red Sandalwood that had been concealed in pebbles which had been declared on accompanying documentation. The import consignment was found to contain undeclared Organ-pipe Coral weighing circa 4.8 t, imported under the guise of declared "Cypraea annulus (sea shells)" [cowrie shells], a species free from trade restrictions. During the follow-up action, a further 25.8 t of Red Sandalwood, destined for export to Dubai, were recovered in Delhi. Investigations are in progress.

On 23 December 2009, it was reported that police in the State of Jammu and Kashmir (J&K) had seized more than 50 t of Red Sandalwood from Shey village in Leh where it had been transported from Andhra Pradesh and was reportedly bound for China. One man was arrested.

On 13 February 2010, regional unit officials of the Directorate of Revenue Intelligence (DRI) in Sanathnagar, Hyderabad, Andhra Pradesh, seized 10 570 kg of Red Sandalwood logs at an inland container depot. The shipment was allegedly being smuggled to Dubai. Two people were arrested.

www.e-pao.net/GP.asp?src=12.240609,jun09; www.ndtv.com/news/india/rare_indian_wood_smuggled_into_china.php; *TRAFFIC India*; *IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. www.iucnredlist.org. Downloaded on 21 January 2010*; <http://timesofindia.indiatimes.com/city/chennai/DRI-seizes-Rs-26-crore-worth-red-sanders/articleshow/5217283.cms>, 11 November 2009; <http://news.webindia123.com/news/articles/India/20091222/1410845.html>, 22 December 2009; *TRAFFIC India*; www.indianexpress.com/news/50-tonnes-of-rare-andhra-wood-headed-for-china-seized-in-leh/5579201, 23 December 2009; www.ptinews.com/news/523137_Red-sanders-logs-being-smuggled-to-Dubai-seized-DRI, 17 February 2010.

SOUTH-EAST ASIA INDONESIA

On 16 July 2009, a raid in Sumatra recovered 33 Tiger *Panthera tigris* (CITES I) skin pieces, ranging in size from a few centimetres to larger pieces; one person was arrested.

On 7 August 2009, authorities in Jakarta carried out a second raid that resulted in the arrests of four suspects for attempting to sell two complete Sumatran Tiger skins, in addition to specimens of other protected wildlife species.

Both raids were conducted by the police, the Indonesian Department of Forestry, Directorate-General for Forest Protection and Nature Conservation (PHKA), working in conjunction with the Wildlife Conservation Society's Wildlife Crime Unit and local partners.

These raids, part of recent stepped-up efforts by Indonesian authorities to control the illegal wildlife trade, bring to 20 the number of arrests made over the previous 18 months for the trade in Tiger parts. Seven of these cases have already resulted in prison sentences and fines, and the rest await trial.

www.wcs.org/press/press-releases/tiger-skins.aspx, 13 August 2009

MALAYSIA

On 16 August 2009, police arrested a Thai poacher from Chiang Rai, Thailand, and recovered scales of a pangolin *Manis* (CITES II) and six sacks of Agarwood *Aquilaria* (II). The arrest was made in a forested area just off the Gerik-Jeli Highway in the Belum-Temengor Forest Complex in the northern State of Perak, which shares a border with Thailand. Police were acting on information provided by WWF's Wildlife Protection Unit (WPU), which regularly patrols the area with other enforcement agencies.

The poacher was among a party of five poachers ambushed by police. Four others escaped, leaving behind a camp stocked with 30 kg of rice and other essentials, indicating they were planning long-term operations. The suspect now faces charges under Section 6 of the *Immigration Act*, for illegally entering the country as well as charges under Section 64 (2) (a) of the *Protection of Wildlife Act* for possession of the pangolin scales and Section 15 of the *Forestry Act*, for collecting Agarwood without a licence.

On 26 August 2009, staff of the Wildlife Crime Unit of the Wildlife and National Parks Department confiscated 98 live animals from a house in Alor Setar in the northern State of Kedah, following three weeks of surveillance and investigations. The animals were hidden in a store room. A man was arrested and released on bail. He faces five separate charges under the *Protection of Wildlife Act 1972* including a charge of cruelty to wildlife.

The seizure included 58 adult male pangolins, 38 adult females, two juveniles and 3.2 kg of pangolin scales. The pangolins were later released into a protected area. They are believed to have been destined for export.

On 7 September 2009, 93 live pangolins *Manis*, each weighing 12 kg, were seized by staff of the State Wildlife Department in Kampung Cherang, Bachok. The animals, which had been destined for sale to restaurants, were packed in individual plastic boxes and were being loaded into a car; a man evaded capture.

The specimens were to be released in a national park.

On 13 September 2009, Malaysian marine police officials caught two Malaysian nationals loading wildlife into a boat in eastern Terengganu State and seized 264 dead owls, 33 Sun Bear *Helarctos malayanus* (I) parts and 4800 live monitor lizards; the men were arrested on suspicion of trying to smuggle them abroad. The lizards were to be released into the wild.

On 27 September 2009, police from the sixth General Operation Force (GOF) battalion in Bakri seized about 40 live pangolins following a car chase along Sungai Sarang Buaya. One man was arrested.

The unit spent four days staking out the river estuary before spotting two boats approaching the coast. One vessel returned to sea after the other landed near the estuary. Two men then began loading sacks of live pangolins into a car before realising they were being watched and sped away. One man was captured and the animals were handed over to the State's Wildlife and National Parks Department.

On 8 October 2008, marine police seized 27 plastic crates filled with some 4000 live frogs from a boat arriving from Indonesia, off Tanjung Harapan. The amphibians were believed to have been destined for local restaurants. The skipper was detained but 14 crew members were released after questioning.

On 5 November 2009, the Malaysian Maritime Enforcement Agency seized 55 live pangolins *Manis* (CITES II) from a boat coasting near the mangrove forest. The animals, which had been destined to be used as food, were handed over to the Department of Wildlife and National Parks.

On 15 December 2009, marine police in Muar seized 62 pangolins *Manis* (CITES II): 31 live specimens were found inside cars and a house in Taman Tasik Ria in Tangkak, while another 31 frozen pangolins were found in a freezer. The seizures follow surveillance by the police over two weeks of the activities of a group of people who evaded capture during the incident. All the pangolins were taken to the Muar marine police jetty before being surrendered to the Wildlife Department.

www.traffic.org/home/2009/8/26/bear-paws-turn-up-in-nationwide-raids.html, 26 August 2009; www.traffic.org/home/2009/8/28/pangolins-saved-from-slaughter.html, 28 August 2009; www.nst.com.my/Current_News/NST/articles/21pgol/Article/index.html; 2009/09/09; <http://help.yahoo.com/l/mye/yahoo/news/>; <http://malaysia.news.yahoo.com/ap/20090914/tap-as-malaysia-smuggled-wildlife-b3c65ae.html?printer=114>, September 2009; <http://thestar.com.my/news/story.asp?file=/2009/9/28/nation/20090928143215>; <http://thestar.com.my/news/story.asp?file=/2009/9/28/nation/20090928143215&sec=nation-&sec=nation>, 28 September 2009; www.nst.com.my/articles/20091009213703/Article/index.html, 9 October 2009; www.nst.com.my/Current_News/NST/articles/26kot/Article/index.html, 6 November 2009; <http://thestar.com.my/news/story.asp?file=/2009/11/17/nation/5316794&sec=nation>

THAILAND

In June 2009, one of the country's most prolific wildlife traffickers was sentenced to two years' imprisonment. He was found guilty of attempting to smuggle 245 live Malayan

Pangolins *Manis javanica* (CITES II) and 63 Black Marsh Turtles *Siebenrockiella crassicollis* (II), into Bangkok via Don Mueang Airport in June 2006. The animals, contained in wooden boxes and accompanied by false papers, had arrived from Kuala Lumpur International Airport and had been destined for China. The police investigation into the role of other gang members involved in this case is under way.

"The success of this legal procedure against wildlife traffickers shows that South-east Asian authorities recognize the value of law enforcement as the major tool in combating wildlife trafficking," said Chumphon Sukkaseam, senior officer of the ASEAN Wildlife Enforcement Network (ASEAN-WEN) in Bangkok.

On 21 August 2009, according to information provided by the Thailand CITES Management Authority, Customs officials at Suvarnabhumi Airport, Bangkok, seized 316 pieces of raw ivory weighing 812.5 kg. The ivory originated from Uganda and Kenya and was illegally imported into Thailand from Qatar. One tonne of ivory was impounded by Customs officials in Bangkok, Thailand, and traced back to Uganda's Entebbe International Airport early this year.

On 27 October 2009, 46 rare Malagasy turtles were seized, following a request to Thailand by the Japanese Government to follow up and arrest a gang of smugglers. Among the turtles seized were Ploughshare Tortoises *Astrochelys yniphora* (CITES I), a species which only occurs in Madagascar and is classified by IUCN as Critically Endangered.

On 20 January 2010, following a 17-month investigation involving the first collaboration between US and Thai law enforcement authorities, a Thai national was charged with trafficking ivory. Earlier in the week, Thailand's nature crime police also raided ivory shops, seized tusks and arrested two other dealers.

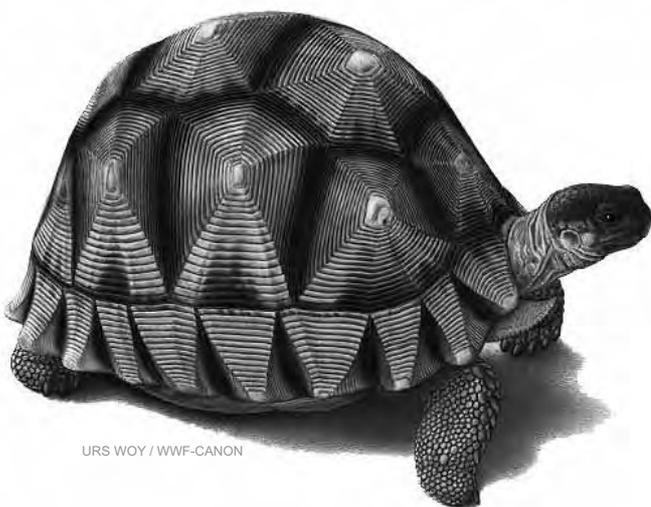
Undercover Customs investigators tracked the suspects by following the source of ivory products sold in the USA back to Asia with support from regional and independent conservation groups.

The individual was arrested in November 2009 in Bangkok. He could now be prosecuted in both Thailand and the USA. The two other dealers who were arrested had been caught with six tusks (weighing a total of 32 kg). Sources close to the operation said this was likely to be a fraction of the overall trade and the kingpins were still to be found.

The first fruits of collaboration were hailed as an important step forward in international efforts to co-ordinate a crackdown on the trade. The next step was to target the leaders of the smuggling chain.

On 24 February 2010, Customs officials at Bangkok's Suvarnabhumi Airport, acting on information, seized 239 African Elephant *Loxodonta africana* (CITES I) tusks hidden in two pallets labelled as mobile phone parts. It is the country's largest ivory seizure to date.

The consignment is reported to have originated in Kenya, on a flight routed via Dubai, and was declared as destined for Lao PDR.



URS WOY / WWF-CANON

PLOUGHSHARE TORTOISE

Ploughshare Tortoises *Astrochelys yniphora* (CITES I) have been seized recently in Taiwan and Thailand. The species has a very small distribution in Madagascar and the population has declined sharply in recent years as a result of poaching for the illegal pet trade. The current population estimate is somewhere near 200 mature animals (IUCN, 2009, www.iucnredlist.org).

A Thai national attempted to pick up the cargo and was detained.

Asia-Pacific News, 30 June, 2009: www.phnompenhpost.com/index.php/2009063026799/National-news/Animal-traffic-hurt-in-alleged-revenge-hit-after-pangolin-escape.html; www.asean-wen.org/index.php?option=com_content&view=article&id=100:major-wildlife-traffic-sentenced-to-thai-prison&catid=45:press-releases&Itemid=89; CITES Management Authority, Thailand; *The New Vision*, 29 June 2009: www.newvision.co.uk/D/8/1/3/686334; www.asiantribune.com/news/2009/10/28/malagasy-turtles-seized, 28 October 2009; IUCN, 2009. IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org. Viewed on 30 October 2009; www.guardian.co.uk/environment/2010/jan/20/ivory-smuggling-ring-thailand; www.washingtonpost.com/wp-dyn/content/article/2010/02/12/AR2010022500297_pf.html; TRAFFIC International

VIET NAM

In January 2009, two men were apprehended after killing two Black-shanked Douc Langurs *Pygathrix nigripes* (CITES I) in Khanh Hoa Province's Hon Heo peninsula.

On 10 March 2009, police detained three men who had allegedly killed five Black-shanked Douc Langurs in Cam Lam district. A patrol unit from the Hon Ba Natural Reserve spotted the three men with the dead animals, and two guns.

On 11 May 2009, forest wardens in Khanh Hoa Province, Ninh Hoa district, found five disembowelled animals inside a bag, each weighing between six and 10.5 kg, after they gave chase to a person on a motorbike on the National Highway 1A. The person fled leaving the bike and bag behind. The dead animals were identified by the Institute of Tropical Biology under the Vietnam Academy of Science and Technology as Black-shanked Douc Langurs. The Khanh Hoa provincial police said they would launch criminal proceedings to track down the suspect.

All the detained men are facing charges of violating regulations on protecting endangered species.

On 16 July 2009, Ha Noi's Environmental Police at Hoang Cau Stadium in Dong Da District seized a frozen Tiger and more than 11 kg of Tiger bones that had been transported from Thanh Hoa Province to Ha Noi via taxi. Three individuals were in the taxi, including the man who claimed ownership of the Tiger.

The bones were identified by the Institute of Ecology and Biological Resources (IEBR), Viet Nam's CITES Scientific Authority, which speculated that the animal, which weighed 57 kg, was probably a young individual that had been recently killed and that the bones had come from at least two adult Tigers.

The Environmental Police believe the Tiger was transported from Central Viet Nam, but it is unknown whether the animal originated in Viet Nam or whether it was a wild or captive-bred specimen.

"To complete the police investigation, we call upon the authorities to carry out DNA testing to help determine where these Tigers came from," said Nguyen Dao Ngoc Van, of TRAFFIC's Ha Noi-based office. "While the continuing trade in Tigers and Tiger parts is of great concern, the work of the Environmental Police towards stopping the trade is encourag-

ing and impressive," added Van. "Although only recently formed, the Environmental Police are quickly improving Viet Nam's capacity to enforce its existing wildlife trade legislation," she said.

On 24 August 2009, Customs officers in the northern port city of Hai Phong seized a consignment from Indonesia of around four kilogrammes of pangolin *Manis* (CITES II) scales concealed in bags of dried seaweed, and 51 sacks containing two tonnes of tortoise shells. The items were found in a container whose waybill declared the contents as dried tuna stomach. The goods were destined for the same company in Ha Noi as an ivory shipment seized in the port on 21 August (see below). The case is being investigated.

In October 2009, the Thanh Hoa Provincial People's Committee fined a man almost VND300 million (USD16 200) for illegally transporting 226.6 kg of pangolins *Manis* (CITES II) through the province.

On 2 October 2009, Viet Nam's Environmental Police and the local Ha Long Police caught employees of the Dai Yen farm extracting and selling bear bile to Korean tourists. The police had staked out the bear farm for days before raiding the facility, located on the outskirts of the town. Police seized more than 200 bottles of gall bile as well as equipment used to tap the bears' gall bladders. The farm owners could not produce valid documentation for 24 of the 81 Asiatic Black Bears *Ursus thibetanus* (CITES I) found in captivity there. Five workers and two South Koreans, who had been visiting the farm on an organized tour, were temporarily taken into custody for questioning.

Bear farming for bile is illegal in Viet Nam, but farmers are allowed to keep bears to display to tourists. In an attempt to protect the few bears remaining in the wild, the authorities microchipped the 4000 bears on farms. The 24 bears involved in this raid had no microchips, which means they were likely illegally caught in the wild.

On 4 November 2009, the People's Committee in Bo Trach district of Quang Binh Province sentenced seven subjects to a total imprisonment of 43 months. The subjects had mobilized hundreds of local people in helping them to blockade local forest rangers in order to snatch timber that had been seized in an illegal logging case.

On 7 December 2009, police in Ha Tinh Province recovered 54 pangolins *Manis* (CITES II) (300 kg) from a car during a patrol conducted by the province's Environment Police, in cooperation with Huong Son District's forest rangers on National Highway 8A. The driver escaped. The specimens, which were being transported from the border with Lao PDR, were handed over to the forest rangers for release into the wild. The case is under investigation.

<http://thanhniennews.com/features/?catid=10>, 25 May 2009; <http://thanhniennews.com/features/?catid=10&newsid=49125> & [newsid=49125](http://thanhniennews.com/features/?catid=10&newsid=49125), 24 May 2009; www.traffic.org/home/2009/7/17/ha-nois-environmental-police-seize-frozen-tiger-and-tiger-bo.html, 17 July 2009; Thanh Nien News, 25 August 2009: www.thanhniennews.com/society/?catid=3&newsid=52052; http://envietnam.org/E_News/E_339/Buon_lau_te_te_bi_phat_gan_300_trieu_dong.html; www.lookatvietnam.com/2009/11/freedom-sought-for-bile-farm-bears.html, 18 November 2009; http://envietnam.org/E_News/E_339/Doi_tuong_bao_vay_kiem_lam_lanh_an_tu.html; Thanh Nien News, www.thanhniennews.com/society/?catid=3&newsid=54125, 11 December 2009

www.thanhniennews.com/society/?catid=3&newsid=52052; http://envietnam.org/E_News/E_339/Buon_lau_te_te_bi_phat_gan_300_trieu_dong.html; www.lookatvietnam.com/2009/11/freedom-sought-for-bile-farm-bears.html, 18 November 2009; http://envietnam.org/E_News/E_339/Doi_tuong_bao_vay_kiem_lam_lanh_an_tu.html; Thanh Nien News, www.thanhniennews.com/society/?catid=3&newsid=54125, 11 December 2009

Ivory seizures in Viet Nam:

It was reported on 29 July 2009 that Customs officials had uncovered 200 kg of elephant ivory tusks illegally imported from Kenya. The items were found hidden in timber inside a container at Hai Phong port. The authorities are seeking the owner of the container, who did not turn up to receive the goods when they arrived in April.

The week prior, in Tanzania, six businessmen were charged with smuggling 11 t of elephant ivory to the Philippines and Viet Nam over the previous six months (see Tanzania).

On 20 August 2009, police officers in Thanh Hoa Province seized 16 elephant tusks (94 kg) concealed in a car headed for Ha Noi after it was stopped for driving in the wrong lane. Police arrested the driver on suspicion of smuggling and seized the car and the tusks as evidence; they were reportedly bound for Ha Noi to be sold.

On 21 August 2009, Customs officers in the northern port city of Hai Phong found more than two tonnes (326 pieces) of elephant tusks in a container from Tanzania claimed to be carrying snail shells. The consignment was destined for a company in Ha Noi. The case is being investigated.

www.straitstimes.com/Breaking+News/SE+Asia/Story/ST/Story_409631.html, 29 July 2009; www.topnews.in/vietnam-police-seize-elephant-tusks-2204473, 21 August 2009; Thanh Nien News, 25 August 2009: www.thanhniennews.com/society/?catid=3&newsid=52052

OCEANIA

AUSTRALIA

On 6 September 2009, at Perth International Airport, Customs and Border Protection officers arrested an Australian national on arrival from Bali after 39 parrot eggs were found concealed in a specially made vest he was wearing under clothing. He was charged with attempting to smuggle wildlife into Australia.

The eggs were secured by the Australian Quarantine and Inspection Service and have been sterilized owing to the high biosecurity risk.

Australian Customs Service Media release, 9 September 2009: www.customs.gov.au

NEW ZEALAND

The director of a company selling medicinal herbs has pleaded guilty to the illegal trade of products derived from CITES-listed animal and plant species. Her company also pleaded guilty.

The case began in August 2007 after an import entry form accompanying a shipment, and lodged with the New Zealand Customs Service (NZCS) on behalf of the company, was found not to include a large number of additional items that were subsequently discovered in the shipment. These included: Ginseng *Panax ginseng* (CITES II), deer horn glue, shaved animal horn, curcuma (turmeric) and plant material believed to be *Dendrobium* Orchidaceae (I/II). All the undeclared items were concealed inside cartons containing other goods which were found to be derived from Siberian Musk Deer *Moschus moschiferus* (I), Saiga Antelope *Saiga tatarica* (II) and *Dendrobium*. No appropriate permit accompanied the shipment.

On 17 October 2007, search warrants were executed at the company's premises where items found included products derived from Hawksbill Turtle *Eretmochelys imbricata* (CITES I), Saiga Antelope, *Bletillae* (*Bletilla* spp. (I) [Orchidaceae]); *Rhizoma cibotii* *Cibotium barometz*; *Aucklandia lappa* [= *Costus Saussurea costus* (I)]; and Agarwood *Aquilaria*. A further inspection in December uncovered products relating to: pangolin *Manis*, Saiga Antelope, Indian Roofed Turtle *Kachuga tecta* (I), *Ephemerantha fimbriata* [= *Flickingeria* Orchidaceae (II)], and Hawksbill Turtle.

The defendants have subsequently pleaded guilty to the illegal trade of herbal products and sentencing was set for 4 March 2010.

On 7 December 2009, at Christchurch District Court, Hans Kurt Kubus, a German national, pleaded guilty to seven charges pursuant to both the *Wildlife Act* (x2) and CITES (x5). He was convicted on all charges and, on 25 January 2010, was sentenced to NZD5000 (USD3500) (NZD1000 per CITES violation) and a total of 14 weeks' imprisonment for the two *Wildlife Act* violations.

Kubus had been apprehended as he was about to depart Christchurch Airport for Frankfurt, in possession of 24 Sticky-toed geckos *Hoplodactylus* sp. and 20 skinks *Oligosoma* sp. that he had illegally collected from the wild. One

gecko was found during a baggage search; the other 43 reptiles were found in a purpose-built body pack concealed in Kubus's underwear.

All endemic New Zealand geckos and skinks are absolutely protected pursuant to the *Wildlife Act* and all endemic geckos are listed in CITES Appendix III.

New Zealand Wildlife Enforcement Group (WEG),
Department of Conservation

AMERICAS

CANADA

The Conservation and Protection Intelligence and Investigation Services Unit from Fisheries and Oceans Canada (DFO) successfully concluded a three-year multi-country, multi-agency operation involving the illegal sale and possession of Northern Abalone *Haliotis kamtschatkana*, listed as a threatened species under the *Species at Risk Act* (SARA) and as Endangered by IUCN.

The investigation was triggered in 2007 and a team of DFO fishery officers spent months unravelling a complex trail of illegally harvested and traded abalone. In August 2008, a woman was fined CAD25 000 (USD23 500) in Richmond Provincial Court, British Columbia, for the illegal possession of Northern Abalone and, in a connected case, on 2 June 2009, a representative of Momoji Seafood Packaging and Exporting Ltd appeared in Richmond Provincial Court after being found in possession of approximately 54 kg of Northern Abalones. A guilty plea was accepted and a fine of CAD35 500 imposed. CAD34 500 of that amount was to be directed to DFO to promote conservation and protection of Northern Abalone through scientific research. The company was also prohibited from possessing any species of abalone for the next two years.

In addition to the above prosecutions and abalone seizures, the investigation led to the discovery of around 340 kg of Northern Abalones in the Lower Mainland of British Columbia, which were subsequently forfeited under court order. Molecular Genetics Research Scientists from DFO's Pacific Biological Station in Nanaimo provided conclusive forensic DNA evidence for the Court that aided in successful prosecutions or guilty pleas. Members of DFO's Conservation and Protection Intelligence and Investigation Services Unit travelled to the USA and Mexico as part of the investigation, which also uncovered a related abalone smuggling operation at the US-Mexico border near Tijuana (see USA).

The Northern Abalone fisheries have been closed since 1990 to halt the decline of the existing wild population and reduce the risk of this species becoming extinct in British Columbia. In 2009, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent scientific group, recommended a change in SARA status of Northern Abalone to "endangered". Illegal harvesting of the mollusc is considered the

biggest factor affecting recovery of the species, and poaching and trafficking abalone is a serious offence under the *Fisheries Act*.

www.dfo-mpo.gc.ca/media/np/press-communique/2009/pr23-eng.htm, 30 October 2009; www.dfo-mpo.gc.ca/media/back-fiche/2009/pr14-eng.htm; IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. www.iucnredlist.org. Viewed on 5 January 2010

USA

On 18 July 2009, at Atlanta Hartsfield International Airport, Charlotte, Customs inspectors found two Asian Bonytongues *Scleropages formosus* (CITES I) packed inside a cooler bag containing plastic bottles of fish sauce belonging to a Charlotte woman arriving from Viet Nam. US Fish and Wildlife Service Inspectors found two black plastic bags inside the bottles, inside each of which was a live fish.

The defendant was charged with violating the *Endangered Species Act* by attempting to import two Asian Bonytongue fish without a permit. She told an inspector that her mother-in-law had given her the boxes of food as a surprise gift at the airport in Viet Nam and that she did not know the live fish were inside her luggage.

The suspect was released on a USD25 000 bond and ordered to appear in court in Atlanta where the charges are pending.

In September 2009, Henry Chan and the company Zenith Trading pleaded guilty to misdemeanor counts under the *Lacey Act* for the illegal possession of White Abalone *Haliotis sorenseni* under the US *Endangered Species Act*. Chan was fined USD50 000, USD10 000 of which is earmarked for abalone research and education in the USA.

The prosecution follows a three-year investigation into the illegal possession and sale of Northern Abalone *Haliotis kamtschatkana* undertaken by the National Marine Fisheries Service (NMFS) in San Diego, with the assistance of The Conservation and Protection Intelligence and Investigation Services Unit from Fisheries and Oceans Canada (DFO) Intelligence and Investigation unit (see Canada).

On 28 January 2010, at the US District Court, Boston, a Nantucket scrimshaw artist was convicted of one count of conspiracy to smuggle wildlife, six counts of smuggling wildlife and two counts of lying to investigators. The suspect was charged with smuggling teeth of Sperm Whale *Physeter catodon* (CITES I) and elephant ivory (I) into the country in violation of CITES and federal endangered species protection laws. He etched pictures onto ivory and whale teeth for sale and had conspired with a Ukrainian man to import the pieces. Sentencing was set for 6 May 2010.

www.charlotteobserver.com/local/v-print/story/965412.html, 23 September 2009; Fisheries and Oceans Canada press release, 30 October 2009; IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. www.iucnredlist.org. Downloaded on 3 November 2009. www.dfo-mpo.gc.ca/media/np/press-communique/2009/pr23-eng.htm; www.bostonherald.com/news/regional/view.bg?articleid=1229132, 29 January 2010



SAIGA ANTELOPE PRODUCTS AMONG ITEMS CONCEALED IN A CONSIGNMENT SEIZED IN NEW ZEALAND.

NEW ZEALAND WILDLIFE ENFORCEMENT GROUP

The Status of the Retail Ivory Trade in Addis Ababa in 2009

E. Martin and L. Vigne

Addis Ababa, capital of Ethiopia, has been identified by TRAFFIC and other wildlife conservation organizations as having one of the largest illegal ivory markets in Africa in recent years (Martin and Stiles, 2000; Milliken et al., 2004; Milledge and Abdi, 2005). Following a major government raid on shops, the number of ivory items seen for sale declined significantly in 2005 compared with previous surveys, but a recent study in July 2009 showed that, while some smaller shops have stopped selling ivory, numerous ivory objects were again being offered for sale. Furthermore, some new outlets selling recently carved ivory have been established since the last survey was carried out in 2008. At that time, some 2000 ivory pieces were recorded on display in souvenir shops. During the recent TRAFFIC survey, the findings of which are presented below, some 1340 ivory products were documented. The vendors indicate that the tusks originated from elephants in Ethiopia, Kenya and Sudan. While the number of ivory items for sale in Addis Ababa has declined over the past decade, European visitors and a growing number of Chinese workers in the country continue to buy ivory items that are openly displayed, stimulating the market for ivory.

INTRODUCTION

Data collected since 2002 by MIKE¹ (Monitoring the Illegal Killing of Elephants) on elephant poaching in Africa show that poaching mortality declined slightly until 2006 and then started to increase sharply (Anon., 2009). A main reason for this increase is the availability of illegal ivory items on sale in retail outlets in much of Africa, making it easy for customers to purchase and, in doing so, to fuel the continuing demand for ivory. Since 2002, the Elephant Trade Information System (ETIS) analyses have consistently demonstrated that unregulated domestic ivory markets in Africa and Asia are key drivers of illegal trade in ivory (Milliken et al., 2009). TRAFFIC has been trying to help governments, including Ethiopia, implement CITES *Resolution Conf. 10.10 (Rev. CoP 14)*, which urges governments to “prohibit the unregulated domestic sale of ivory (raw, semi-worked or worked)”.

In January 2005, 262 Ethiopian Government officers, including enforcement guards, policemen, security personnel and wildlife inspectors, carried out a synchronized raid on 66 retail outlets selling ivory illegally in Addis Ababa. A total of 1374 ivory items and

three raw tusks (weighing a total of about 500 kg) and other wildlife products were seized. Indeed, a market survey undertaken two months later recorded the presence of only 78 ivory items (Milledge and Abdi, 2005). Wildlife conservationists believed that this raid would greatly reduce the trade, which it certainly did for a while. No further law enforcement actions took place, however, so ivory items started to reappear on the local market once again. This report presents the results from a follow-up survey carried out in July 2009.

METHODS

Ivory is typically displayed in souvenir shops as foreigners are the prime buyers, and is usually not available in other types of outlets. A detailed survey of ivory items in Addis Ababa's souvenir shops was undertaken between 21 and 26 July 2009. Data were collected on the number and types of objects, their size, age, and price. Photographs of items were taken wherever possible to supplement documentation. Information was also collected from shopkeepers regarding prices and origin of tusks, ivory craftsmen, nationalities of customers, and vendors' views on the present and future trade. Daniel Pawlos, in charge of monitoring wildlife products for the newly-established Ethiopian Wildlife Conservation Authority (EWCA), was interviewed regarding ivory seizures and the work of that Authority.

Data collected in this survey were compared with earlier surveys to show indicative trends. “Old” items consist of antiques or objects carved before the CITES ban on international trade in elephant ivory came into effect in 1990. “Recent” items refer to pieces that were made after 1990, and include brand new items. Ivory items observed on display, as well as additional stock the authors found that had been put aside in bags, were counted and recorded by product type.

The official exchange rate was Ethiopian birr ETB12.40 to USD1.00 and was very close to the black market rate. There has been a significant devaluation of the birr since January 2008 when it was officially valued at ETB9.08 to USD1.00.

DISTRIBUTION AND STATUS

According to estimates made by T. Allen-Rowlandson, there were 1750 elephants in Ethiopia in 1990, excluding Mago and Omo national parks, where R. Lamprey later counted 657 elephants in 1994 (Said et al., 1995). Thus, there may have been over 2000 elephants in Ethiopia in 1990. By 2006, there were 634 “definitely known” elephants in the country, with possibly another 920 (Blanc et al., 2007). Unfortunately, elephants are still being illegally killed in Ethiopia. For example, one elephant was poached in July 2009 in the Babille Elephant Sanctuary (D. Pawlos pers. comm., July 2009). Poachers are also killing elephants in Sudan and Kenya and, according to ivory sellers in Addis Ababa, some of the tusks are supplied to craftsmen in Ethiopia.

¹MIKE: The overall goal of MIKE is to provide information needed for elephant range States to make appropriate management and enforcement decisions, and to build institutional capacity within the range States for the long-term management of their elephant populations.

LEGISLATION

Ethiopian legislation on trade in wildlife and their products is well described by Milledge and Abdi (2005). It is sufficient to note that a proclamation in 2005 stated that it is illegal to own, sell, transfer, export or import any wildlife product without obtaining a permit from the Ministry of Agricultural and Rural Development or from a “regional organ”. In 2007, a new proclamation, number 541/2007, which came into effect on 21 August of that year, also stated that “the following are prohibited unless a permit is obtained from the Ministry or the concerned regional organs as appropriate: any activities of trade in wildlife and their products” (Anon., 2007). These proclamations include all ivory, old as well as new. Nobody has a permit today to sell ivory and the government does not plan to issue any (D. Pawlos, pers. comm., July 2009). Penalties for breaking the law include fines of ETB5000–30 000 (USD403–2419) and/or between one and five years in gaol.

RESULTS

Origins and prices of elephant tusks

Most new tusks used by Ethiopian craftsmen came from Ethiopia, Sudan and Kenya, according to two important ivory vendors in Addis Ababa. Recent elephant poaching incidents in Ethiopia have occurred in Mago National Park (Milledge, 2008), Gambella National Park (Blanc *et al.*, 2007) and Babelle Elephant Sanctuary (D. Pawlos, pers. comm., July 2009). In Kenya, in 2007 and 2008, at least 146 elephants were poached, and another 150 were lost in the first eight months of 2009, with some tusks going to Ethiopia (Elephant Programme, Kenya Wildlife Service, pers. comm., October 2009). In early 2007, traders from Isiolo in northern Kenya bought tusks from Samburu poachers for USD22/kg. By October 2008 this price had risen to USD33, according to informers in northern Kenya in March 2009. Traders took some of the tusks by lorry to Mandera and Moyale on the Ethiopian border, from where they were taken north to the capital (Vigne and Martin, 2008a, 2008b).

In Addis Ababa, tusk prices have been increasing (in both US dollar and Ethiopian birr terms) at least since 1993. Ivory workshops in that year were able to obtain a two-to-five kilogrammes tusk for ETB250 per kg (USD50 at the official exchange rate and USD30 at the unofficial rate) (Vigne and Martin, 1993). By January 2008, the price for a tusk weighing two kilogrammes had risen sharply to ETB1000 (USD110) per kg (Vigne and Martin 2008a). In July 2009, the price for tusks weighing up to two kilogrammes was ETB1000 per kg but, due to devaluation, the equivalent US dollar price was USD81.

Ivory craftsmen in and around Addis Ababa

The number of craftsmen working ivory in and around Addis Ababa has declined in recent years. In 1993, one large workshop on the outskirts of the city had 20 ivory carvers (Vigne and Martin, 1993). By 2009 the two main ivory retail sellers in the city said they had up to six and three ivory craftsmen, respectively, in their workshops in Addis Ababa, often working on a part-time basis. The first vendor said his craftsmen earned about ETB2000 (USD161) a month, while the second explained that his craftsmen carved both ivory and wood depending on the raw material available and were paid according to what they made. It is possible there are a few more craftsmen, probably working on a part-time basis, in particular making ivory jewellery as such pieces were the most frequently seen ivory items in the shops (17 outlets had necklaces and 11 had bangles and rings that had been



PHOTOS, FROM TOP:

A. FIGURINES, BUSTS, COMBS, PIPES AND RINGS ARE COMMON IVORY ITEMS ON DISPLAY IN ADDIS ABABA'S SOUVENIR SHOPS.

B. NEW NECKLACES AND BANGLES ARE THE MOST FREQUENTLY SEEN IVORY ITEMS IN ADDIS ABABA'S SOUVENIR SHOPS, ESPECIALLY IN THE NEW OUTLETS.

C. MOST SOUVENIR OUTLETS IN CENTRAL ADDIS ABABA ARE SMALL SHOPS SUCH AS THESE, SOME OF WHICH STILL SELL IVORY.

	Old, displayed	Old, kept in bags	New, displayed	New, kept in bags	Total
JEWELLERY					
Ring	147		155	50	352
Bangle	154	42	39	13	248
Necklace	11		52	25	88
Earrings (pair)	3		38		41
Pendant	2		107		109
FIGURES					
Animal	7		62	1	70
Human	29		96	2	127
Bust	1		14	36	51
TUSKS					
Polished				2	2
Bridge				2	2
Carved long	1			1	2
Carved tip			2		2
MISCELLANEOUS					
Chopsticks (pair)			24	9	33
Cigarette holder			16	18	34
Comb			18		18
Hand cross	1		3		4
Mask			5		5
Name seal			8	53	61
Paper knife			3		3
Pipe	3		8	1	12
Vase	2		6		8
Misc. items	33		18	17	68
Grand Total	394	42	674	230	1340

Table 1. Ivory items seen for retail sale in Addis Ababa, July 2009. *Note: The items kept in bags represent additional stock.*

recently made). There apparently are no craftsmen working ivory in the main market, the Mercato, at the present time.

Numbers of retail outlets selling ivory and the number of ivory items seen

In July 2007, 37 retail outlets in Addis Ababa were selling between one and 249 ivory items, averaging 36. Most outlets were located on Churchill Avenue, Colson Street, around Tewodros Square, Saint Teklehamanot area and Nigeria Street near the post office, and there were several in two locations of the Mercato. Souvenir shops selling ivory were also found in a number of hotels, including some new hotels in the city that attract transit passengers. Two shops at Bole International Airport displayed new ivory beaded necklaces.

A total of 1340 ivory items were recorded during the survey (see Table 1). Of these, 1068 were openly displayed (394 older items and 674 recently made objects), while 262 other items were stored out of sight in large plastic or paper bags or sacks, mainly because some vendors opted to display only a few objects at a time, keeping additional stock in bags. In two outlets, 42 of the items contained in bags were old bangles and, in one outlet, 230 were brand new items which had arrived very

recently from craftsmen and consisted mainly of name seals, rings, busts and necklaces, in that order. About one-third (436) were old items and two-thirds (904) appeared to have been recently produced, the most numerous items being rings, pendants and human figurines. The most common old items were antique bangles. These originally came from tribes in Sudan and southern Ethiopia and were very thick, heavy and darker in colour due to age, often tied together in sets of two or three. These were found primarily in souvenir shops selling old tribal items. Other common older items were rings and human figurines. Almost all the ivory products observed for sale, both old and new, were made in Ethiopia except for the old Sudanese bangles.

Prices for ivory objects

Retail prices varied greatly. A souvenir shop in an expensive hotel with high overheads charged a lot more for ivory items than a stall in the Mercato. During this survey, the weakened world economy and the local rainy season meant there were fewer foreign visitors. Frequent power cuts and rain kept customers away so that some vendors were desperate to sell items and accepted lower prices. The age of an item, its condition, size and quality were all important factors in determining prices.

Item	Size (cm)	Average price (USD)
Ring	thin	3
Pendant cross	15	8
Necklace, beads	medium	16
Bangle	thin	29
	medium	53
Bangle, old	thick	34
Name seal	8–10	30
Chopsticks (pair)	20	35
Cigarette holder	6	35
Comb	10	36
Human figurine	7	43
	20	268
Animal figurine	5	45
	10	76
Mask	15	137
Bust	8–13	202
Vase	15	221

Table 2. Retail prices for certain ivory items seen in Addis Ababa, July 2009.

Vendors sometimes offered 20% discounts after bargaining or for the purchase of several items. Some outlets had items labelled with fixed prices, usually in birr but also in US dollars. The most expensive ivory items seen were a large old beaded necklace from a five-star hotel for USD806, and a new five-kilogrammes polished tusk in a large souvenir outlet near Tewodros Square for the same price. The least expensive were tiny new rings for USD3 each (Table 2). There were no carvings of outstanding quality made by master carvers comparable to what is found in eastern Asia, but some of the items were well carved. Those of similar quality, age and size as items available in eastern Asia were much less expensive. This is because the raw material is cheaper than in Asia and overheads are less.

Customers for ivory items and vendors' views on the trade

Ethiopians rarely buy ivory items except very occasionally as gifts for foreigners. The main buyers are foreign tourists, diplomats, businessmen, UN and African Union officials, NGO staff, and those who have come to the country to attend conferences. The most common nationalities purchasing ivory were said to be Europeans and Chinese, and sometimes Americans. In the last decade, the Chinese have become important buyers of ivory items. The number of Chinese residents has increased considerably, from around 100 in 2001 to 3500 in 2006 (Sautman and Hairong, 2007). There are also growing numbers of Chinese workers in other African countries who frequently pass through Addis Ababa's new large airport in transit to China, sometimes staying in the larger hotels. They purchase a variety of items and are also the main buyers of chopsticks and name seals. A survey conducted in January 2008 found that chopsticks and name seals made up 15% of the new ivory items for sale compared with 11% in the current study, but more could be ordered and supplied quickly. Some tourists and vendors confuse elephant ivory for Hippopotamus *Hippopotamus amphibius* or wild pig teeth from various

African species, mostly Warthog *Phacochoerus africanus*. These are carved into smaller items, and pieces that were the same size and quality as elephant ivory were also sometimes the same price as elephant ivory.

The vendors' views on the ivory trade were mixed. Certain traders with larger businesses regretted that their ivory had been confiscated and that they had received no compensation, or have sold nearly all their remaining items in the last year and are not replacing them. Several larger dealers continue the trade, confidently selling new items, unhindered. Some smaller outlets have phased out their ivory in the last year owing to the expense and risk involved, while others still have old stock. Some vendors were confident, wishing to sell ivory items in bulk, others were suspicious, removing their displayed ivory or pretending items were sold. New vendors said ivory sells in similar amounts as their other souvenirs; these vendors had not experienced the 2005 raid and seemed unaware of the strict penalties for dealing in ivory.

Indicative trends in the retail ivory trade in Addis Ababa

Quantitative data on retail ivory sales has only been collected since 1999. There has been a considerable decline in the number of ivory items seen in Addis Ababa over the last decade—from 9996 seen in 54 outlets in 1999, to 1340 in 37 outlets in 2009. The indicative trend has been consistently downward, with a large decline in March 2005 due to the aforementioned raid two months earlier (see Table 3).

There has been an increase in the number of souvenir shops in the city, with several curio outlets in new hotels. The number of retail outlets selling ivory objects has declined, however, but not at the same scale as the number of ivory items. Many vendors have become nervous about selling ivory and display none or fewer items. Some souvenir shops, especially smaller ones in the Mercato and around the post office area, now sell mainly new and cheap souvenirs instead of the traditional, old Ethiopian handicrafts, and these outlets had far fewer ivory items compared with 2008. Some souvenir shops that still specialize in old tribal goods and handicrafts, such as shields, wooden stools, rugs, silver jewellery and beads, sell a few old ivory items, along with other wildlife products such as colobus monkey *Colobus* skins, carved Hippopotamus or Warthog teeth, and Ostrich *Struthio camelus* eggs. There were also skins of various cats, including four new Cheetah *Acinonyx jubatus* (CITES Appendix I) skins on sale in one outlet for USD200 each.

In 1999, large ivory figurines and masks were common. Small ivory items, especially jewellery, now dominate sales probably because they are easier to smuggle out of the country. Small human figurines, usually of Ethiopian people in traditional dress and sometimes religious or historic Ethiopian figures, such as King Menelik, are popular. These are preferred by Europeans. No Chinese-style figurines were seen for sale.

Generally, the US dollar price has increased four-fold for most ivory items over the decade, using the official exchange rate and excluding inflation. In Ethiopian birr,

prices have risen ten-fold due to devaluation. The exceptions are the prices for masks, which increased by one-third in US dollars, and old bangles, which have stayed the same price. This is due to a fall in demand as they are bulky to smuggle and presumably less fashionable. The Chinese prefer new items.

New efforts in law enforcement

Up until 2008, wildlife conservation activities were run by the Ethiopian Wildlife Conservation Department, a small unit under the Ministry of Agriculture and Rural Development. It then became part of the Ministry of Culture and Tourism and was renamed the Ethiopian Wildlife Conservation Authority (EWCA). It now has more staff: a lawyer, an anti-poaching expert and additional game scouts in the national parks and sanctuaries (Pawlos, 2009). In December 2008, the new Authority re-opened the main government storeroom for wildlife products, which had been closed since the arrest and prosecution of the former storekeeper in 2004, following the theft of about 1700 kg of ivory from the store the year before (Milledge and Abdi, 2005). Most of the ivory stockpile is over 20 years old, all of which is now part of a newly audited list with each ivory piece marked and weighed (D. Pawlos, pers. comm., July 2009). The Authority held a workshop on law enforcement in October 2008, in collaboration with TRAFFIC, and published a booklet *The Ethiopian Wildlife Laws* in Amharic, targeted at Customs and other law enforcement officers, and which includes photographs of endangered wildlife and ivory products.

The Ethiopian Government has recently confiscated ivory items at various airports. In late 2008, three carved ivory items were seized at an airport north of Gambella. Also in late 2008, a man from Côte d'Ivoire, in transit to South Africa, was arrested at Bole International Airport with 56 kg of carved ivory (D. Pawlos, pers. comm., July 2009). The Authority plans to produce a billboard for display at the airport, instructing people not to buy ivory, and to promote public awareness via television, especially on penalties that many people may be unaware of. It intends to follow this up as soon as possible with police training and another large-scale raid of the souvenir shops (D. Pawlos, pers. comm., July 2009).

DISCUSSION AND CONCLUSION

Although the number of ivory items for retail sale in Addis Ababa has declined over the last ten years, demand for ivory items in the country's capital continues to threaten elephant populations in Ethiopia, and neighbouring Sudan and Kenya. Many items are on display in souvenir shops—mostly jewellery, small figurines, busts, and small utilitarian objects—in flagrant violation of the country's laws. There are, however, fewer outlets selling ivory due to reduced customer demand since the CITES ban and the reluctance of vendors to stock ivory following the 2005 raid. The number of souvenir shops has increased, however, with more foreigners visiting the country. The new airport has attracted more transit passengers to the city, and hotels have recently been constructed with souvenir outlets, some of which sell ivory. European visitors and the growing number of Chinese workers coming to Addis Ababa—who particularly like to buy new ivory items which are much cheaper than similar items in China—are creating a continuing demand for ivory which encourages elephant poaching.



NEW IVORY CARVING, ADDIS ABABA, JULY 2009; LUCY VIGNE

RECOMMENDATIONS

- The Ethiopian Government has the capacity to enforce its ban on worked ivory in retail outlets, as was proved by the successful raid carried out in 2005 in conjunction with TRAFFIC. There need to be regular law enforcement operations to seize ivory items and other illegal wildlife products for sale in retail markets. Removing items from public view will decrease demand.
- Foreign visitors and passengers transiting Bole International Airport should be informed that it is illegal in Ethiopia to buy and possess ivory of any age and in any form. Leaflets and public awareness announcements stating the penalties are needed. This could be arranged by the EWCA in collaboration with an NGO.

YEAR	NUMBER OF RETAIL OUTLETS			NUMBER OF IVORY ITEMS	
	Total visited	Selling ivory	% selling ivory	Items counted	Average no. of items per outlet with ivory
Jun 1999*		54		9996	
Apr 2004**	101	51	50	3557	70
Mar 2005**	82	5	6	78	16
Jan 2008*		44		2152	49
Jun 2008**	171	43	25	1977	46
Jul 2009*	199	37	19	1340	36

Table 3. Summary comparison of ivory surveys in Addis Ababa, various years. *Survey by E. Martin and L. Vigne; **Survey by S. Milledge



LUCY VIGNE

IVORY ITEMS, MOSTLY NEW, FOR SALE IN ADDIS ABABA, JULY 2009.

- Controls need to be improved along the international land borders between Ethiopia, Kenya and Sudan by the appropriate governments, further training opportunities for relevant officials are required, and a reward system should be instigated so that officials are less likely to take bribes. Officials should be instructed to collect full data from those caught with ivory, such as the source of the ivory, prices paid and the nationalities involved, in order to improve implementation and enforcement of CITES.
- All seizure cases should be reported to ETIS in a timely manner so that Ethiopia's law enforcement actions become part of the global database tracking the illegal trade in elephant ivory.

ACKNOWLEDGEMENTS

The TRAFFIC East/Southern Africa office initiated and funded this survey. Tom Milliken and Simon Milledge supplied data and contacts in Ethiopia. Daniel Pawlos of EWCA provided helpful information on the activities of that unit and on ivory seizures.

REFERENCES

- Anon. (2007). Ethiopia, The Federal Democratic Republic of. *Federal Negarit Gazeta*, Proclamation No. 541/2007, Addis Ababa, 21 August.
- Anon. (2009). Monitoring of illegal hunting in elephant range States. CoP15 Doc. 44.2. <http://www.cites.org/eng/cop/15/doc/index.shtml>. Viewed on 11 December 2009.
- Blanc, J.J., Barnes, R.F.W., Craig, G.C., Dublin, H.T., Thouless, C.R., Douglas-Hamilton, I. and Hart, J.A. (2007). *African Elephant Status Report 2007*, IUCN, Gland, Switzerland.
- Martin, E. and Stiles, D. (2000). *The Ivory Markets of Africa*. Save the Elephants, Nairobi, London.
- Milledge, S. and Abdi, M. (2005). A Model for Africa: Ethiopia's Efforts to Close Unregulated Domestic Ivory Markets in Addis Ababa. *TRAFFIC Bulletin* 20(3):119–128.
- Milledge, S. (2008). Trip Report to Ethiopia. Unpublished report for TRAFFIC.
- Milliken, T., Burn, R.W., Underwood, F.M. and Sangalakula, L. (2004). *Elephant Trade Information System (ETIS) and the Illicit Trade in Ivory: a Report to the 13th Meeting of the Conference of the Parties*. CoP13 Doc. 29.2, CITES, Gland, Switzerland.
- Milliken, T., Burn, R.W., and Sangalakula, L. (2009). *Elephant Trade Information System (ETIS) and the Illicit Trade in Ivory: a Report to the 15th Meeting of the Conference of the Parties*. CoP15 Doc. 44.1, CITES, Gland, Switzerland.
- Pawlos, D. (2009). General information on current achievements of EWCA, towards controlling illegal trade & trafficking in wildlife & products. Unpublished report for EWCA, May.
- Said, M.Y., Chunge, R.N., Craig, G.C., Thouless, C.R., Barnes, R.F.W. and Dublin, H.T. (1995). *African Elephant Database 1995*, IUCN, Gland, Switzerland.
- Sautman, B. and Hairong, Y. (2007). Friends and interests: China's distinctive links with Africa. *African Studies Review* 50(3):75–114.
- Vigne, L. and Martin, E. (1993). Ethiopia's active trade in ivory. *Swara* 16(6):28–29.
- Vigne, L. and Martin, E. (2008a). Survey of the ivory items for retail sale in Addis Ababa in 2008. *Pachyderm* 44:66–72.
- Vigne, L. and Martin, E. (2008b). An increase in demand for ivory items in Ethiopia threatens elephants. *Oryx* 42(4):483.

Esmond Martin and Lucy Vigne are independent consultants studying the international trade in endangered species, in particular the trade in ivory and rhino horn.

E-mail: rhino@wananchi.com

POSTSCRIPT

Following up on the findings of this TRAFFIC survey, a series of successful raids on curio shops in Addis Ababa by the Ethiopian authorities in November 2009 resulted in the seizure of 191 kg of ivory and other wildlife products, and a series of arrests and fines. Undercover operations prepared the groundwork for the raids on 115 shops on 25 November by the Ethiopian Wildlife Conservation Authority, the federal police, Addis Ababa police and the judiciary. Of these outlets, 81 were found to contain illegal wildlife products. Among the items seized were raw ivory, worked ivory in various forms (jewellery, carvings, chopsticks), Hippopotamus and Warthog tusks, carpets made from wildlife skins, tails of Giraffes, nails of Leopard and Lion and Ostrich eggs. The owners of all the shops involved were arrested and, in court appearances processed with unprecedented swiftness, were sentenced and received fines ranging from ETB5000 to ETB9000 (USD393–708). Similar action, codenamed Operation Costa, was also simultaneously undertaken by authorities in Burundi, Kenya, Rwanda, Tanzania and Uganda.

Yeneneh Teka, Ethiopian Wildlife Conservation Authority (EWCA), Director of Wildlife Development and Protection Directorate, Ethiopia.

GUIDELINES FOR CONTRIBUTORS

Papers about wildlife trade issues are invited for consideration by TRAFFIC International, the publisher of the *TRAFFIC Bulletin*, providing the material is unpublished and not under consideration for publication elsewhere. Contributions can be in the form of feature articles (which should not usually exceed 7000 words, excluding tables and references), Short Communications (up to 3000 words), and news items (up to 2000 words).

Referees and the Editor judge each submitted manuscript on data originality, accuracy and clarity. A minimum of two reviewers are selected by TRAFFIC International for feature articles and Short Communications, with suggestions from authors welcome. The author will be notified of acceptance, rejection or need for revision of the paper following the review process, which takes up to eight weeks. If accepted, the author will be responsible for incorporating the reviewers' comments, as appropriate. The author should correct the proofs and return them to the Editor within an agreed time-frame (usually 10 days). The paper will then be edited and returned to the author for comment/further changes if necessary, and the author's approval. Acceptance of a paper for publication in the *TRAFFIC Bulletin* will normally be confirmed when any outstanding points have been clarified with the Editor. Copyright of material published in the *TRAFFIC Bulletin* will be vested in TRAFFIC International.

EDITING AT TRAFFIC INTERNATIONAL: The editing process will include: reading the report, checking for sense and style and making adjustments accordingly, as necessary; standardizing spelling, punctuation, checking for provision of sources; communicating with the author over possible substantive changes; standardizing layout; scanning and placing illustrations, etc.

The editing period at TRAFFIC International usually takes a minimum of two weeks, depending on the length of the article and the extent of editing required. After this period, correspondence between the editor and the author will aim to finalize the text to the mutual satisfaction of both parties and to allow for any outstanding errors to be eliminated before the report is finalized.

GUIDE TO AUTHORS: Manuscripts should be written in the English language and submitted to the Editor via electronic mail (in Word, Rich Text format). Submissions in other languages may be considered for translation but an English summary must be prepared. All submissions must provide an approximate word count and the spelling should be thoroughly checked, using a computerized spell-checker, if possible.

A feature article in the *TRAFFIC Bulletin* will normally comprise the following structure, where possible:

Abstract. 200 words, or fewer, in italics. This should express briefly the purpose, results and implications of the study. Note that an Abstract is not necessary for Short Communications.

Introduction. This section should help familiarize the reader with the subject and explain the rationale for the study and the reasons for choosing any aspects highlighted in the report.

Background. This may be included, particularly on a subject with which readers may not be familiar, and will briefly cover geography and social environment of area covered.

Methods. The means by which data for the study were gathered, number of researchers, the duration of research, and study areas, must be clearly stated.

Distribution and Status. Information relating to a description of the species under discussion.

Legislation. A concise account of legislation/trade controls which may affect trade involving the subject under discussion should be included.

Results. The results can consist of further sections of text which should be broken up, with subheadings, as appropriate. If research has been weak and flawed, point this out, rather than try to hide the fact. By flagging the main points emerging from the research throughout the article, it will be much easier to draw together a discussion and conclusions section.

Discussion and Conclusions. These sections, which may be combined, should constitute an analysis of what the results actually show, what may be inferred from them (if relevant), and what may be concluded on the subject in question, including any limitations. No new results should be introduced in these sections.

Recommendations. These should be linked to the discussion/conclusions in the report. Try to make these as specific as possible, stating who should take action, where possible.

Acknowledgements. These should include acknowledgement of funders of research and production, as well as of reviewers and contributors.

References. See also below.

SPECIFIC STYLE REQUIREMENTS:

Text: Text should be in 10pt Times New Roman and reported in the third person. After a full-stop, there should be two spaces.

Paragraphs: Each paragraph must be indented five spaces using the tabulator (not space bar), and no spaces should appear between paragraphs, except before a new section heading.

Species names: Common or vernacular names of species should at first mention be accompanied by their full scientific name. If referring to a distinct species, use initial capital letters, for example, African Elephant *Loxodonta africana*. If discussing more than one species under a generic name, then no capital letter is used, for example, rhinoceroses (as opposed to Black Rhinoceros). The common name only is used in subsequent references to the species name, except in cases where there may be several common names in use or when there is no common name; in such cases the scientific name only will be referred to.

References in text: Reference all material that is not based on the observation of the author(s). Published literature is cited in the text by author, and year of publication (Mabberley, 1997); three or more authors are represented by the first author's surname (Chen *et al.*, 1996). Personal communications should be cited in text as: initial, surname and year (J. Smith pers. comm. to M. Brown, January 1999); correspondence cited as: initial, surname, in litt., month/year (T. Holt, in litt. to M. Kray, May 1998).

Numbers: Numbers from one to nine, and all numbers at the beginning of a sentence should be spelled out in full; numbers of 10 and more should be written as figures.

Units of measure/currency: All measurements should be in metric units. Currencies should at first mention have a USD exchange rate, though original currencies should be quoted rather than converted values.

Tables/Figures: Submit only essential tables and figures; these should not exceed 10 in number and should preferably be no more than five, or fewer. They must be referred to (in Arabic numerals) and interpreted in the text. Do not present the same data in a table and a figure. The caption should appear beneath the table/figure, and should indicate when the data were collected. All tables should be tabulated (do not use space bar), with no cells/boxes or horizontal/vertical rules. Rules will be incorporated at the desktop publishing stage. Where appropriate, both common and scientific names should be included in the table.

Illustrations: High quality colour/black and white slides/prints should be submitted by e-mail for selection by the Editor, in consultation with the author. Captions and name of photographer should be indicated. Maps should be of a quality for direct reproduction and to proportions appropriate for reproduction to a width of one column (80 mm) or one page (170 mm), and a maximum depth of 130 mm. It is the author's responsibility to obtain copyright clearance for reproduction of illustrative material and to ensure adequate acknowledgement.

Reprints: Following publication of the article, five reprints are provided free of charge. Additional copies can be obtained, stocks allowing, but postage costs will be charged for.

Please direct any queries to: traffic@traffic.org

TRAFFIC MAILING DATABASE FORM

PLEASE COMPLETE THE FOLLOWING FORM IF YOU ARE SUBSCRIBING TO THE TRAFFIC BULLETIN FOR THE FIRST TIME, YOUR DETAILS HAVE CHANGED, OR IF YOU PREFER TO RECEIVE THE TRAFFIC BULLETIN BY ELECTRONIC MAIL ONLY.

Title (Dr/Mr/Mrs/Ms/Other) _____ Reference No. _____
(Please refer to envelope label)

Organization _____
(Please spell out acronyms in full)

Name _____ Position _____

Address _____

Post/Zip code _____ Country _____

Website _____ E-mail _____

Tel. Number _____ Fax Number _____

- [] Please type "X" if your contact details have changed.
[] Please type "X" if you wish to receive a copy of the TRAFFIC Bulletin in electronic format only.
[] Please type "X" if you wish to CANCEL your subscription to the TRAFFIC Bulletin.

Nature of business (type "X" in square brackets):

- [] education [] CITES Management Authority
[] university [] CITES Scientific Authority
[] library [] conservation organization
[] enforcement agency [] media/communications
[] government authority [] commercial
[] non-governmental organization [] individual
[] international government organization [] other Please specify _____

Please specify area of interest (type "X" in square brackets):

- [] animal species threatened by trade [] medicinal plant trade
[] plant species threatened by trade [] traditional medicine
[] fisheries trade [] wildlife trade impacts on priority ecoregions
[] timber and wood products trade [] international treaties and wildlife trade
[] livelihoods [] other Please specify _____

I would like to contribute towards the production of the TRAFFIC Bulletin or other important activities of TRAFFIC.

I enclose a cheque/international money order for _____ made payable to TRAFFIC International.

GIFT AID DECLARATION

Please type "X" in box below if you wish TRAFFIC to reclaim the tax on your gift (if you are a UK taxpayer).

[] I would like TRAFFIC to reclaim the tax on this donation, and any further donations I make from the date of this declaration until I notify you otherwise.

Signature: _____ Date: _____

TRAFFIC International

219a Huntingdon Road, Cambridge, CB3 0DL, UK.
Tel: (44) 1223 277427; Fax: (44) 1223 277237; E-mail: traffic@traffic.org

TRAFFIC Central Africa

Regional Office c/o IUCN, Regional Office for Central Africa, PO Box 5506, Yaoundé, Cameroon.
Tel: (237) 2206 7409; Fax: (237) 2221 6497; E-mail: tcaf@traffic.org

TRAFFIC East/Southern Africa

Regional Office c/o WWF Southern Africa Regional Programme Office
PO Box CY 1409, Causeway, Harare, Zimbabwe.
Tel: (263) 4 252533/252534; Fax: (263) 4 703902; E-mail: traffic@wwfsarpo.org

South Africa Office c/o Endangered Wildlife Trust, Private Bag x11, Parkview 2122, Johannesburg, South Africa.

Tel: (27) 11 486 1102; Fax: (27) 11 486 1506; E-mail: trafficza@ewt.org.za

Tanzania Office c/o WWF Programme Office, PO Box 106060, Dar es Salaam, Tanzania.

Tel/Fax: (255) 22 2701676; E-mail: traffictz@bol.co.tz

TRAFFIC North America

Regional Office c/o WWF-US, 1250 24th Street, NW, Washington, DC 20037, USA.

Tel: (1) 202 293 4800; Fax: (1) 202 775 8287; E-mail: tna@wwfus.org

Canada Office c/o WWF-Canada, Suite 1588, 409 Granville Street, Vancouver, BC, V6C 1T2, Canada.

Tel: (1) 604 678 5152; Fax: (1) 604 678 5155; E-mail: ecooper@wwfcanada.org

Mexico Office c/o WWF-Mexico Programme Office,

Ave. México 51, Col. Hipódromo Condesa, C.P. 06100 México, D.F., Mexico.

Tel: (52) 55 5286 5631; Fax: (52) 55 5286 5637; E-mail: areuter@wwfmex.org

TRAFFIC South America

Regional Office Quiteño Libre E15-12 y la Cumbre, Sector Bellavista, Quito, Ecuador.

Tel/Fax: (593) 2 226 1075; E-mail: tsam@traffic.sur.iucn.org

TRAFFIC East Asia

Regional Office Room 2002, 20/F, Double Building, 22 Stanley Street, Central, Hong Kong.

Tel: (852) 2 530 0587; Fax: (852) 2 530 0864; E-mail: trafficea@biznetvigator.com

China Office c/o WWF-China Programme Office, Room 2616, Wen Hua Gong, (Laodong Renmin Wenhua Gong Dongmen), Beijing Working People's Culture Palace, Beijing 100006, People's Republic of China.

Tel: (86) 10 65116211; Fax: (86) 10 65116261; E-mail: teachina@wwfchina.org

Taipei Office PO Box 7-476, Taipei 106, Taiwan.

Tel: (886) 2 2362 9787; Fax: (886) 2 2362 9799; E-mail: treatai@ms1.hinet.net

Japan Office 6th Floor, Nihonseimei Akabanebashi Bldg, 3-1-14, Shiba, Minato-ku, 105-0014,

Tokyo, Japan. Tel: (81) 3 3769 1716; Fax: (81) 3 3769 1304; E-mail: traffic@trafficy.org

TRAFFIC India

Regional Office c/o WWF-India, 172-B Lodi Estate, New Delhi-110 003, India.

Tel: (91) 11 41504786; Fax: (91) 11 43516200; E-mail: ssinha@wwfindia.net

TRAFFIC Southeast Asia

Regional Office Unit 9-3A, 3rd Floor, Jalan SS23/11, Taman SEA, 47400 Petaling Jaya, Selangor, Malaysia. Tel: (603) 7880 3940; Fax: (603) 7882 0171; E-mail: tsea@po.jaring.my

Greater Mekong Programme Office c/o IUCN Viet Nam, Villa 44/4 Van Bao,

Ba Dinh District, Ha Noi, Viet Nam.

Tel: (84) 4 3 726 1575; Fax: (84) 4 3 726 4665; E-mail: traffic-gmp@traffic.netnam.vn

TRAFFIC Europe

Regional Office c/o TRAFFIC International, 219a Huntingdon Road, Cambridge CB3 0DL, UK.

Tel: (44) 1223 277427; Fax: (44) 1223 277237; E-mail: traffic@traffic.org

Belgium Office Bd Emile Jacqmain 90, B-1000 Brussels, Belgium.

Tel: (32) 2 343 8258; Fax: (32) 2 343 2565; E-mail: traffic@traffic.org

Central Eastern Europe Project Office c/o WWF-Hungary, 1141 Budapest, Álmos vezér útja 69/A, Budapest, Hungary.

Tel: (36) 1 214 5554 (Ext 132); Fax: (36) 1 212 9353; E-mail: traffic@wwf.hu

France Office c/o WWF-France, 1 Carrefour de Longchamp, 75016 Paris, France.

Tel: (33) 1 55 25 86 40; Fax: (33) 1 55 25 84 74; E-mail: sringuet@wwf.fr

Germany Office c/o WWF-Germany, Rebstocker Str. 55, D 60326 Frankfurt, Germany.

Tel: (49) 69 79144 183; Fax: (49) 69 617221; E-mail: homes@wwf.de

Italy Office c/o WWF-Italy, Via Po 25/c, 00198 Rome, Italy.

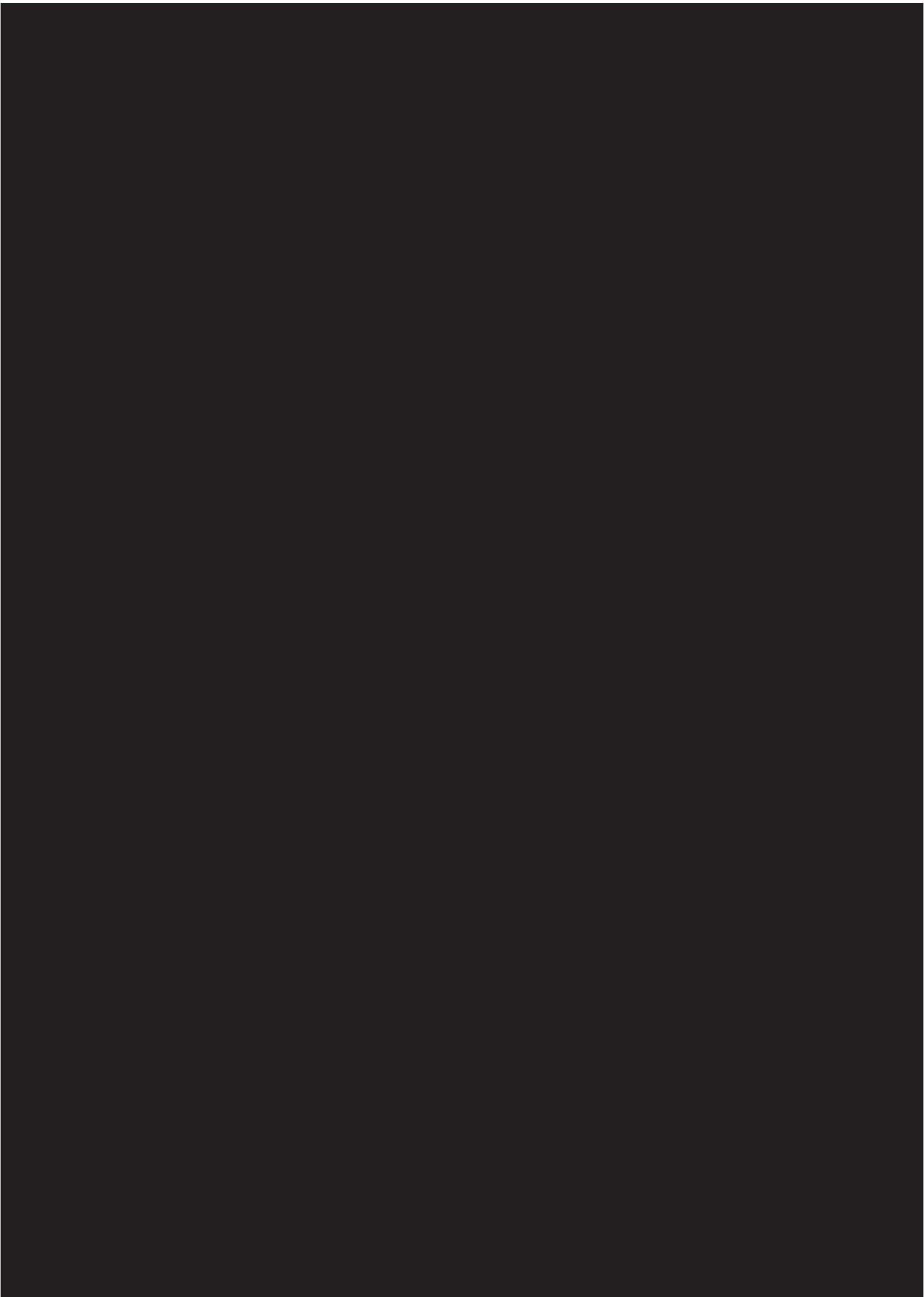
Tel: (39) 06 84497357; Fax: (39) 06 84497356; E-mail: traffic.italy@wwf.it

Russia Office c/o WWF-Russia Programme Office, Nikoloyamskaya str. 19, Building 3,

109240 Moscow, Russia; Tel: (007) 4957270939; Fax: (7) 4957270938; E-mail: avaisman@wwf.ru

Sweden Office c/o WWF-Sweden, Ulriksdals Slott, S-17081 Solna, Sweden.

Tel: (46) 8 624 7400; Fax: (46) 8 85 1329; E-mail: mats.forslund@wwf.se



TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

For further information contact:

The Executive Director
TRAFFIC International
219a Huntingdon Road
Cambridge CB3 0DL
UK

Telephone: (44) (0) 1223 277427

Fax: (44) (0) 1223 277237

Email: traffic@traffic.org

Website: www.traffic.org

TRAFFIC
the wildlife trade monitoring network

is a joint programme of

