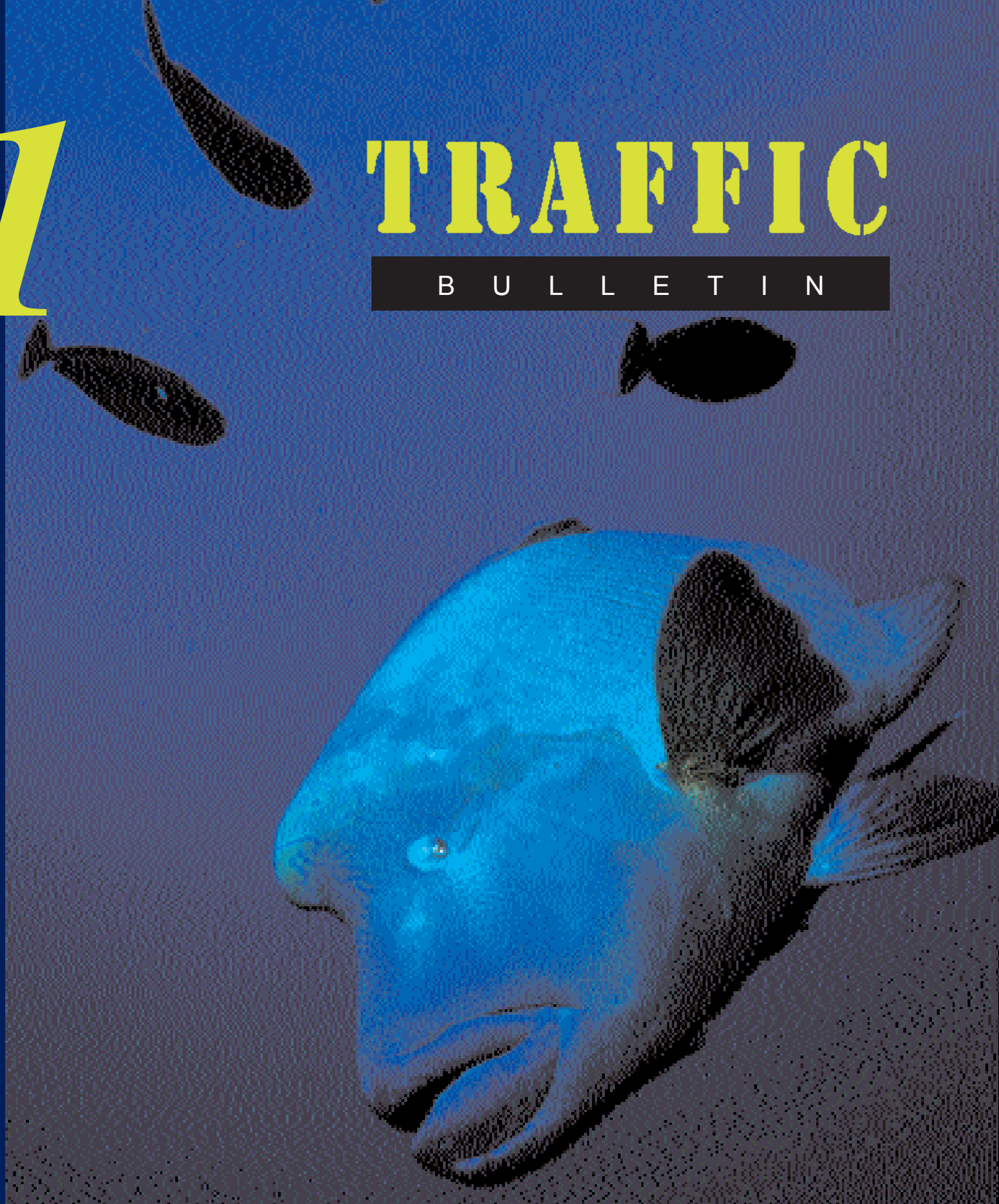
VOL. 18 NO. 1

TRAFFIC BULLETIN



HONG KONG'S LIVE REEF FISH TRADE

SOUTH AFRICA'S WOODCARVING INDUSTRY

HAIRY ARMADILLOS IN BOLIVIA

WILDLIFE TRADE IN YUNNAN

The Journal of the TRAFFIC Network disseminates information on the trade in wild animal and plant resources

SEPTEMBER 1999

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

The *TRAFFIC Bulletin* is a publication of the TRAFFIC Network, a joint programme of WWF-World Wide Fund for Nature and IUCN-The World Conservation Union. TRAFFIC's purpose is to help ensure that wildlife trade is at sustainable levels and in accordance with domestic and international laws and agreements. This is achieved through the investigation, monitoring and reporting of such trade, particularly that which is detrimental to the survival of flora and fauna and that which is illegal.

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

Editor and Compiler
Kim Lochen

Assistant Editor
Julie Gray

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

ISSN 0267-4297

UK Registered Charity No. 1076722

Cover photograph:
Humphead Wrasse *Cheilinus undulatus*
(WWF/BIOS/Yves Lefèvre)

Photograph credits for this page, from top:
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WWF-Canon/Fred Hazelhoff
B. Peredo/Bolivian Photo Agency

Printed on recycled paper by The Burlington Press (Cambridge) Ltd, Station Road, Foxton, Cambridge, CB2 6SW UK.

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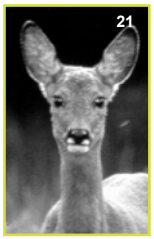

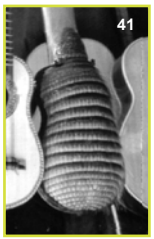

September 1999

Tuna Fishing Dispute Lands in Court

The continuing dispute about appropriate management measures for the highly valuable Southern Bluefin Tuna *Thunnus maccoyii* (SBT) fishery landed in an international tribunal in late August 1999, which ruled that an experimental fishing programme set up unilaterally by Japan was inconsistent with its obligations under the United Nations Convention on the Law of the Sea (UNCLOS) and with the provisions of the Convention for the Conservation of Southern Bluefin Tuna 1993 (CCSBT).

Now in its fifth year, the CCSBT held its annual meeting in Tokyo from 22 to 26 February 1999. There was co-operation among delegates to encourage Indonesia, South Korea and Taiwan, in particular among non-Members, to join the Convention. The issue of trade certification was also tabled with Australia stating that it wishes to adopt such a scheme within CCSBT while Japan advised it would consider this option at a later date. However, discussion of catch limits proved a stumbling block in efforts to reach agreement between the three Parties to the Convention - Australia, New Zealand and Japan - and the meeting's failure to decide on a revised total allowable catch (TAC) heralded months of further meetings on the question of catch limits.

The meetings revolved principally around the subject of Japan's announcement of its intention to take an experimental catch, as it did in 1998, over and above any agreed TAC. Japan claims scientific grounds for the extra catch, describing it as a quota to allow monitoring of the SBT stock, but fisheries experts from Australia and New Zealand dispute the scientific validity of Japan's approach, which they consider to be in breach of its obligations as a member of CCSBT. Despite repeated attempts to reach a consensus, including an endeavour to implement an experimental fishing programme agreed by all three Parties to CCSBT, the Japanese began fishing in June 1999 according to a unilaterally declared experimental quota for 1999 amounting to 2000 t, exceeding that of 1998 by 540 t.

In response to Japan's actions, on 30 July 1999, Australia and New Zealand filed a request with the International Tribunal for the Law of the Sea (ITLOS) for an interim injunction against Japan. The injunction called for immediate cessation of Japan's experimental fishing, pending arbitration of the dispute according to the terms of UNCLOS, to which Australia, Japan and New Zealand are all Parties. Japan responded by stating that the Tribunal should deny Australia and New Zealand their requests and countered by filing requests of its own. Japan asked ITLOS to prescribe, firstly, that Australia and New Zealand urgently resume negotiations towards an agreed TAC, annual quotas and the continuation of experimental fishing on a joint basis. Secondly, if consensus on these matters were not to be reached within six months, Japan contended that Australia and New Zealand should agree to allow resolution of disputed issues by independent scientists.

The requests filed were heard in court between 18 and 20 August 1999 in Hamburg. The Tribunal noted that there is no disagreement between the Parties that the stock of SBT is severely depleted. It considered that there is scientific uncertainty regarding measures to be taken to conserve the stock, and considered that in the circumstances the Parties should act with prudence and caution to ensure that effective conservation measures are taken to prevent serious harm to the stock of SBT. The Tribunal ordered *inter alia* that Parties should resume negotiations without delay with a view to reaching agreement on measures for the conservation and management of SBT and that Parties should restrict their catches. It prescribed six provisional measures pending the decision of an arbitral tribunal to be constituted under UNCLOS, which were that all three Parties shall: a) ensure that no action is taken to aggravate or extend the dispute; b) ensure that no action is taken which might prejudice the carrying out of any future decision by the arbitral tribunal; c) ensure that their annual catches in 1999 and 2000, including the experimental catch taken by Japan in 1999, do not exceed the national quotas already agreed under CCSBT; d) refrain from conducting any experimental fishing programme except with the agreement of the other Parties or unless the experimental catch is counted against its national quota; e) resume negotiations to reach agreement on measures for the conservation and management of SBT; and f) make further efforts to reach agreement with other States engaged in fishing this species with a view to ensuring appropriate conservation and management measures.

Each Party must submit a report to the Tribunal on compliance with these measures by 6 October 1999.

Preparation and sale of Southern Bluefin Tuna *Thunnus maccoyii* in Tokyo, Japan.

Photo: TRAFFIC/G. Sant

Media Release from the Federal Minister for Agriculture, Fisheries and Forestry and the Minister for Foreign Affairs, (Australia), 10 June 1999; The Sydney Morning Herald (Australia), 23 June 1999; TRAFFIC Oceania; Press releases 24, 25, 26 and 28 issued by the International Tribunal for the Law of the Sea (dated 30 July, 9/13/27 August 1999)

TRAFFIC South America will re-open in October 1999, filling a critical gap in the TRAFFIC Network's geographic coverage. The office will be based in Quito, Ecuador, and co-located with the Regional Office for South America of IUCN-The World Conservation Union. TRAFFIC's work in the region is already off to a strong start, with projects on mahogany, medicinal plants and the sea cucumber trade from the Galapagos either completed or under way. Applications for the position of Director for the regional office are currently being sought. For more information contact TRAFFIC International.

bulletin board

Bobbie Jo Kelso Communications Manager at TRAFFIC International, moved in June 1999 to the post of International Manager of Campaign Communications at WWF International in Switzerland. Over her five years with TRAFFIC, Bobbie Jo motivated a dynamic communications approach for the TRAFFIC Network, providing a solid foundation for the work of her successor, Sabri Zain, who will join TRAFFIC in October 1999 from WWF Malaysia.

James Compton has been appointed to set up a TRAFFIC Southeast Asia National Office in Vietnam, with responsibility also for Lao PDR and Cambodia. The office is co-located with the WWF Indochina Programme Office in Hanoi. As well as initiating the systematic monitoring and analysis of wildlife trade as part of an effective strategy to control biodiversity loss from Indochina, initial priorities will include assisting the accession of Lao PDR to CITES and helping to develop CITES understanding and implementation in Vietnam and Cambodia (CITES members since 1994 and 1997 respectively).

Celia Denton started work as Funding Development Officer at TRAFFIC International in May 1999, with responsibility for a comprehensive strategy to increase the TRAFFIC Network's financial security.

Nina Marshall Senior Programme Officer at TRAFFIC East/Southern Africa-Kenya has been appointed Deputy Director of TRAFFIC East/Southern Africa and will be based at the TRAFFIC office in Johannesburg, South Africa .

traffic web sites

http://www.traffic.org
http://www.twics.com/~trafficj
http://www.deol.ru/nature/protect
http://www.wow.org.tw

Text of this issue of the *TRAFFIC Bulletin* is available on www.traffic.org.

LEGAL BRIEF

Caviar:

The European Commission recently revised its list of countries and territories approved as sources of fishery products for human consumption. The new list was established via Decision (EC) 277/99 of 23 April 1999 and any relevant consignments from unlisted countries and territories are accordingly barred from import to the European Union. With reference notably to caviar, Kazakhstan and Bulgaria are excluded from the list.

Ornamental Fish and Coral:

Mozambique's fishery law (*Lei das Pescas*, dated 26 September 1990) was updated in February 1999 to prohibit the capture, processing, transport and export of ornamental fish and live coral in national waters. Ornamental fish and coral had reportedly been harvested wastefully and traded fraudulently, against a background of poor legal enforcement. Issued by the Ministerio da Agricultura e Pescas, the ban applied to these fishery sectors will remain in force for two years, allowing a period of research to determine sustainable harvest levels for the marine organisms involved.

Swordfish:

Traders bringing Swordfish *Xiphias gladius* into the USA have been subject to new regulations since 14 June 1999. Two forms of document are now required for import - a Swordfish Import Report and a Swordfish Certificate of Eligibility (COE). The importation of whole Swordfish or pieces of under 15 kg, dressed weight, is now prohibited, unless accompanied by a COE stating that any pieces were derived from fish over that weight. Certificates of Eligibility otherwise include the name of the ocean of origin of the catch, information about the harvesting vessel and a validating signature and stamp.

These new restrictions provide the tools to implement a recommendation of 1995 from the International Commission for the Conservation of Atlantic Tunas (ICCAT) for controlling the harvest of undersized Atlantic Swordfish. As they also bring the minimum size for imported Swordfish into line with the minimum size for Swordfish taken from US waters, domestic enforcement efforts should be simplified as a result.

Sources: Official Journal of the European Community, 27 April 1999; J. Alves, Endangered Wildlife Trust, South Africa; Swordfish Import Monitoring Program, National Marine Fisheries Service; Australian Fisheries Management Authority Notice (Australia), 10 June 1999

Ginseng Dealers Surveyed, Conservation Measures Addressed

TRAFFIC North America has concluded the second phase of its work on American Ginseng *Panax quinquefolius*, which focused on the trading practices of ginseng dealers in the State of Virginia - one of the country's main areas of wild ginseng production - and their perceptions towards a ginseng management programme and the sustainability of the trade. The first phase, referred to in *TRAFFIC Bulletin* 16(3):121-124, culminated in the publication of *American Ginseng: The Root of North America's Medicinal Herb Trade* (Robbins, 1998), a detailed review of the harvest, trade, management and conservation status in the USA and Canada of this CITES Appendix II-listed species.

During Phase II, a questionnaire survey was developed and distributed to dealers in Virginia, and a subsequent focus group meeting involving these dealers was convened to explore the results of the survey. Further, in May 1999, TRAFFIC met with federal administrators of the management programme to discuss the results and implications of this research and to establish what efforts are under way or planned to improve the programme's performance.

The Role of Dealers

Industry participation, co-operation and information are critically important to the overall direction and success of any plant trade management programme. With their first-hand knowledge of the trade, dealers can detect patterns in supply and demand that may not be known to regulators, yet which are potential indicators of increasing resource scarcity.

The US ginseng management programme is administered by the US Fish and Wildlife Service (USFWS), in collaboration with some 25 ginseng-exporting States (US States where ginseng is either cultivated or occurs naturally). Ginseng dealers are required by the Government to record and submit information on ginseng purchases and sales, which is used to calculate the amount, location and intensity of harvest and the age structure of natural ginseng populations. Dealers are in an ideal position to help enforce ginseng harvest laws by refusing to purchase wild roots from diggers out of season or roots that do not meet State or federal age requirements. They also serve as educators, keeping diggers informed of harvest seasons and appropriate harvesting practices and locations.

Recognizing the niche dealers occupy in the programme, TRAFFIC North America surveyed dealers in the State of Virginia, the fifth-largest producer of wild ginseng in the USA. Self-administered questionnaires were distributed to 67 respondents; 12 completed and submitted questionnaires to TRAFFIC.

Results

In some cases, the results confirm, while others refute, previously held assumptions about the attitudes of dealers towards ginseng harvest, regulation and conservation in the USA. Contrary to the belief that all industry opposes regulation, most dealers who responded to TRAFFIC's survey support mandatory measures such as shortening the harvest season and replanting harvested ginseng seeds to reduce the effects of harvest pressure and to help secure the future of wild populations. For instance, eight respondents indicated that they would be willing to delay the beginning of the harvest season from 15 August to 31 August, and nine supported greater uniformity in harvest seasons between Virginia and neighbouring States. Dealers were also asked for feedback on the number of wild roots per pound (453 g) in weight collected in Virginia and whether they had observed a decrease in root size. Five respondents reported that the number of wild roots per pound had increased, while half of the dealers had observed a decrease in the size of wild roots. The predominance of smaller plants suggests that there may now be fewer older, reproductively viable wild ginseng plants in Virginia than previously. Generally, ginseng does not produce viable seed much before its fourth growing season. Thus the collection of young plants from a population can reduce the number of seed-bearing plants and lead to destabilization of that population.

TRAFFIC surveyed dealers' participation in and perceptions towards the ginseng certification and inspection system in Virginia. States seeking approval or reapproval from the federal Government to allow export of wild American Ginseng must be shown to have established a system under which State officials inspect and certify dealers' wild ginseng. According to dealers' responses, a few gaps were revealed in the inspection and certification process of wild ginseng in Virginia. For instance, two out of twelve respondents reported that they do not take all wild ginseng roots in their possession to an inspection site for inspection. Similarly, six respondents reported that State inspectors do not physically inspect all wild roots in their possession at the time of certification. It should be noted, however, that three respondents reported taking their entire inventory to a site for inspection and that all their stock was physically checked by a State official.

Most respondents were satisfied with the performance of the certification programme, though many indicated that the system imposes some level of burden to dealers. One respondent reported that the programme is *not burdensome*, four reported it *occasionally burdensome*, three reported it *moderately burdensome*, one characterized it as *heavily burdensome* and three did not express an opinion. When asked about the overall adequacy of the programme, five respondents reported that the current system is *adequate*, four reported it to be *somewhat adequate*, and one reported it as being *somewhat inadequate*; two respondents did not express an opinion.

State	Ginseng type approved for State export in 1998	Ginseng type approved for State export in 1999[1]	No. of licensed ginseng dealers[2] in 1998	1998 wild harvest (kg)	Minimum value[3] of wild ginseng to State economy (USD)	State Funds earmarked for the ginseng programme in 1998 (USD)
Alabama	wild, cultivated	wild, cultivated	8	211	127 866	no specific fund
Arkansas	wild, cultivated	wild, cultivated	4	327	198 162	no specific fund
Georgia	cultivated	wild, cultivated	10-12	128	-	15 000 in kind
Idaho	-	cultivated	-	-	-	-
Illinois	wild, cultivated	[4], cultivated	40-45	2 390[5]	1 448 340	no specific fund
Indiana	wild, cultivated	wild, cultivated	43	2 128	1 289 568	no specific fund
Iowa	wild, cultivated	wild, cultivated	13	267	161 802	general plant funds
Kentucky	wild, cultivated	wild, cultivated	136	7 483	4 534 698	no specific fund
Maine	cultivated	cultivated	2	0	0	no specific fund
Maryland	wild, cultivated	wild, cultivated	6-10	112	67 872	no specific fund
Michigan	cultivated	cultivated	2	0	0	no specific fund
Minnesota	wild, cultivated	wild, cultivated	52	929	562 974	general plant funds
Missouri	wild, cultivated	wild, cutlivated	23	695	421 170	37 000 in kind
New York	wild, cultivated	wild, cultivated	100	348	210 888	no specific fund
North Carolina	wild, cultivated	wild, cultivated	57	2 946	1 785 276	no specific fund
North Dakota	cultivated	cultivated	-	-	-	-
Ohio	wild, cultivated	wild, cultivated	63	2 093	1 268 358	no specific fund
Oregon	cultivated	cultivated	1	0	0	Self-supporting @ 25/licence
Pennsylvania	wild, cultivated	wild, cultivated	80	829	502 374	-
Tennessee	wild, cultivated	wild, cultivated	47	3 145	1 905 870	no specific fund
Vermont	wild, cultivated	wild, cultivated	4-5	87	52 722	no specific fund
Virginia	wild, cultivated	wild, cultivated	60-65	2 072	1 255 632	supported by Plant Pest Control Funds
Washington	cultivated	cultivated	-	-	-	-
West Virginia	wild, cultivated	wild, cultivated	86	3 479	2 108 274	no specific fund
Wisconsin	wild, cultivated	wild, cultivated	20	755	457 530	9 100(53 000 in kind)
Total			**857-874**	**30 424**	**18 359 376**	**9 100(105 000 in-kind)**

Table 1. Harvesting and export figures for wild American Ginseng *Panax quinquefolius* in 1998, and the minimum value to State economies.
[1]in the case of wild and wild-simulated (wild plants growing in areas that are slightly tended, to remove weeds, for example) ginseng roots, applies only to specimens of five years of age or older (i.e., with five or more bud scale scars). [2]does not include licensed diggers or growers. [3]based on average price (USD275/lb; USD606/kg) dealers paid diggers in 1998; price varies from State to State and according to quality of the root. [4]decision to allow export of wild specimens awaits receipt of 1998 harvest data; [5]1997 harvest figures used in absence of 1998 harvest data. - = no data available. *Sources: Office of Scientific Authority, USFWS; TRAFFIC North America*

The burdensome nature of the programme perceived by some is not surprising considering the often numerous inspections each harvest season (August/September to December) and the long distance to inspection sites reported by several respondents. For example, four respondents reported that their wild roots are inspected between 10 and 15 times each season, two reported between five and 10 times, another two between one and five times, one respondent reported a single time; three respondents expressed no opinion. Additionally, four dealers reported travelling more than 50 miles to a ginseng inspection station, one between 30 and 50 miles, another between five and 15 miles; six respondents did not respond to the question. Inspections are held at specific inspection stations off site, as well as on dealers' premises: four reported that their wild ginseng is inspected on site, one indicated that inspection is conducted off site, four reported on-and-off site inspections; three did not respond to the question.

Focus Group Meeting

To present the survey findings and improve understanding of the dealers' views towards ginseng management, in March 1999 TRAFFIC convened a focus group meeting in Virginia with five ginseng dealers, a facilitator and two TRAFFIC representatives. The dealers identified issues that they believed to be critical to the successful, long-term management of wild ginseng populations in their State. They were also asked to recommend specific measures and efforts needed to promote sustainable harvest and management of wild ginseng. Four critical areas were identified by dealers: 1) the need for diggers to improve their understanding of the resource's biology, ecology, etc., so that their harvest practices have a minimal effect on plants; 2) better availability of and access to reliable and timely market information; 3) improvements in law enforcement and in enforcement personnel's intelligence methods and skills at root identification; and 4) population status and survival.

The following were among the opportunities mentioned for addressing the critical issues:

- developing and disseminating education materials to schools, teachers and rural outreach programmes that promote sustainable and responsible ginseng harvesting techniques;

- establishing a dealer co-operative for better control over price fluctuations;

- training and increasing the number of law enforcement agents to target unlicensed dealers and diggers who violate harvest regulations;

American Ginseng *Panax quinquefolius*, plant and products.

American Ginseng roots in glycerine solution (left).

- postponing the beginning of the digging season to ensure ginseng seeds are viable for planting upon harvest;

- harmonizing State harvest seasons to discourage out-of-season harvest and sales;

- undertaking further research and analysis of specific wild populations, especially those subjected to frequent harvesting, to better understand impacts of harvest and determine appropriate management measures;

- reallocating or reassigning government officials to serve as mobile inspectors in cases where inspections at State ginseng stations might be unreasonably burdensome for dealers owing to the distance or to the volume of roots involved.

TRAFFIC staff met with USFWS administrators of the ginseng programme to convey and discuss the results of the dealer survey and focus group meeting. The main message to USFWS officials was clear: today's ginseng dealers represent the latest generation of rural entrepreneurs who stand to gain or lose a great deal from ginseng, and know all too well that their natural heritage - and the future of their trade - depends on co-operation with government managers, and more importantly, co-operation between themselves.

In turn, the USFWS informed TRAFFIC about government modifications to the national ginseng programme, particularly in response to TRAFFIC's earlier findings that information on ginseng populations provided by States to USFWS for evaluation of ginseng export approval were insufficient and unreliable (Robbins, 1998). These modifications, they reported, had resulted in improvement in the detail, quality and meaning of information at the disposal of programme administrators but biological information was still lacking.

The USFWS informed TRAFFIC that techniques for the biological monitoring of wild ginseng populations were being developed by USFWS for use by States. These are to be presented to States at a ginseng management workshop in Kentucky in November 1999. While States advocate field research (e.g., population studies, dealer/digger surveys), very few have undertaken this work owing to lack of funding and technical assistance. While most States do not receive federal funding or set aside specific funding in their budgets for the ginseng management programme, the costs of portions of the programme, such as ginseng inspection and certification, are defrayed by general funds earmarked for State natural resource or agriculture departments. These departments typically administer the ginseng management programme and are responsible for gathering and submitting complete and timely information on ginseng harvest and populations to USFWS. Until a reliable source of funding is available, the status of wild ginseng populations and the role and impact of harvests will remain under studied and largely unknown. TRAFFIC recommends, and USFWS agrees, that there is an urgent need for a conservation trust fund for economically important forest products upon which States, universities, non-governmental organizations and individuals could rely for funding ginseng field monitoring, law enforcement, inspections, programme administration and resource education. It is hoped that the support of influential NGOs and herbal companies can be enlisted in order to persuade US Congress to support a bill proposing the creation of this fund.

On 2 August 1999, the USFWS issued its latest scientific finding for the export of wild and wild-simulated American Ginseng. Only roots of five years of age or older and harvested during the 1999 harvest season from 18 pre-approved States will be eligible for export from the USA. In addition, cultivated roots of any age may be exported from 24 pre-approved States, including the 18 States from which export of wild and wild-simulated roots is already approved. TRAFFIC intends to monitor the implementation of this new export policy and plans to assist the federal agency and States to detect aspects of the policy that are potentially problematic.

Reference

Robbins, C.S. (1998). *American Ginseng: The Root of North America's Medicinal Herb Trade*. TRAFFIC North America. USA.

C.S. Robbins, Programme Officer, TRAFFIC North America.

51st IWC Meeting

The 51st annual meeting of the International Whaling Commission (IWC) was held in St. George's, Grenada, from 24 to 28 May 1999. The meeting was chaired by Michael Canny, the Commissioner for Ireland, and was attended by 34 voting members (out of a total of 40 Parties of the International Convention for the Regulation of Whaling (ICRW)). Observers from six non-member countries (Barbados, Canada, Iceland, Morocco, Namibia and Zimbabwe) were present. Ninety-one non-governmental organizations (NGOs) registered to attend, including TRAFFIC and WWF. The Commission meeting was preceded by meetings of the IWC's Scientific Committee and various technical sub-committee meetings.

New Resolutions

Resolutions passed by the IWC are not binding on Parties, only changes to the Schedule of the Convention itself are. In general, the IWC prefers to pass resolutions by consensus, but draft resolutions may be brought to a vote.

Thirteen sponsors put forward a *resolution on co-operation between the IWC and CITES* (IWC/51/43) which went to a vote and passed with a majority of 21 in favour, 10 against, and 3 abstentions. The purpose of the Resolution is to reaffirm the relationship between the two treaties and to stress that IWC is the competent global authority for the management of whales, while, at the same time, pointing out that IWC has yet to complete work on its Revised Management Scheme (RMS), which is being devised to regulate any future commercial whaling. A number of IWC Parties expect Norway and Japan once again to propose the downlisting of various stocks of Minke Whale *Balaenoptera acutorostrata*[1] and possibly other whales at the 11th meeting of the Conference of the Parties to CITES in April 2000. The Resolution was introduced, in part, to prepare for future requests to CITES Parties by the IWC for comments on CITES downlisting proposals.

A *resolution on DNA testing* (IWC/51/52) was put forward by 10 countries with the purpose of establishing DNA testing methods and results as an agenda item in the IWC's Scientific Committee. In the past, documents on this subject were introduced to the Scientific Committee under a variety of agenda items, making it difficult to discuss the subject in its own right. The Resolution was passed, with 23 countries voting in favour and 11 countries against.

Although the above two Resolutions were adopted by vote, several countries voiced their objections, arguing that trade-related issues were outside the competency of the IWC, and that the IWC should not seek to influence decision-making within CITES, which had its own criteria for the listing of species.

At the 50th annual meeting (Oman, 1998), the IWC decided to introduce environmental concerns as a regular agenda item. After making a formal presentation on the environmental threats to whales, the Commissioner for the USA offered to provide 'seed money' to supplement IWC research funds allocated to this issue. Thirteen sponsors put forward a *resolution for the funding of high priority scientific research* (IWC/51/50) allocating GBP126 000 to research environmental threats to cetaceans. The Resolution was passed with 21 in favour, 12 against, and one abstention.

Other issues discussed during the meeting included: competency of the IWC to manage small cetaceans; the health effects of eating whale meat; the effect of cetaceans on fisheries; and the Scientific Committee's concern over the potential impact of incidental catches on the "J stock" of Minke Whales (a population in the Sea of Japan-Yellow Sea-East China Sea). The suite of measures known as the 'Irish proposal' was not debated in detail. The Irish proposal was originally intended to move forward agreement on the RMS, but it has become a broader attempt to break the deadlock between those for and against the lifting of the IWC's moratorium on commercial whaling. Its elements include limited coastal whaling for Japan and Norway under the RMS, a ban on high seas whaling, an end to lethal 'scientific' whaling, and a ban on international trade of whale meat. As at the 1998 annual meeting, most countries made position statements on the Irish proposal. The majority of statements were supportive of the process behind the Irish proposal, although not necessarily the individual elements.

Overall, there appeared to have been little progress with the components of the RMS dealing with inspection and observation schemes. However, the Netherlands agreed to receive comments on existing draft text on supervision and control and to organize a workshop in June of next year before the next IWC meeting.

The 52nd IWC meeting will be held during the first week of July 2000, in Adelaide, Australia.

Marcus Phipps, Deputy Regional Director, TRAFFIC East Asia

[1]some authorities recognize Southern Minke Whale *Balaenoptera bonarensis* as a separate species.

Hong Kong's Live Reef Fish Trade

Worldwide concerns about the destructive methods used to catch live reef fish for food have attracted considerable attention, and prompted the Asia Pacific Economic Co-operation (APEC) to host the Workshop on the Impacts of Destructive Fishing Practices on the Marine Environment, held in Hong Kong, December 1997. However, little attention has been paid to the probable unsustainability of the trade in live reef fish for food. TRAFFIC East Asia therefore initiated a study of the Hong Kong trade, carried out from May 1997 to February 1998, to collate available information on the quantity, species and origin of reef fish imported into and re-exported out of Hong Kong. Research was conducted through interviews with restaurateurs and traders of live reef food fish and through analysis of available import and re-export statistics. The findings, summarized below, are presented in the TRAFFIC East Asia report *The Hong Kong Trade in Live Reef Fish for Food*[1].

Source and volume of imports to Hong Kong

Hong Kong is believed to be the world's largest consumer of live reef fish (Johannes and Riepen, 1995), with imports sourced from over 10 countries/regions. The majority of live reef fish destined for Hong Kong are caught in tropical reef habitats in Southeast Asian countries, with Indonesia and the Philippines the main sources, and Giant Grouper *Epinephelus lanceolatus*, High-finned Grouper *Cromileptes altivelis* and Humphead Wrasse *Cheilinus undulatus,* among the most commonly captured species. However, declining stocks in traditional fishing grounds such as the Philippines (Barber and Pratt, 1997) have forced fishers and traders to look further afield to meet demand. Papua New Guinea and the Solomon Islands are becoming increasingly important source countries, although this may also be due, in part, to the recent push by Pacific island countries to increase exports owing to the high value of live reef fish (G. Sant, pers. comm., September 1998).

Keith Wilson

Popular in trade, the Humphead Wrasse *Cheilinus undulatus* is particularly susceptible to stock depletion owing to its long life cycle and relatively small population size.

In 1997, Hong Kong imported an estimated 32 000 t of live reef fish, of which an estimated 25 600-28 800 t were consumed in Hong Kong and the difference re-exported to China. Hong Kong traders estimated that 75% of imports comprised about 12 of the most commonly available species in Hong Kong: Humphead Wrasse, Leopard Coral Trout *Plectropomus leopardus*, Spotted Coral Trout *P. areolatus*, High-finned Grouper, Green Grouper *Epinephelus coioides,* Flowery Grouper *E. polyphekadion,* Tiger Grouper *E. fuscoguttatus*, Giant Grouper, Red Grouper *E. akaara*, Mangrove Snapper *Lutjanus argentimaculatus* and Brown Spotted Grouper *E. bleekeri/E. areolatus* (traders use the same common name - *Chi Ma Ban* or Brown Spotted Grouper - for *E. bleekeri* and *E. areolatus*).

Comparison of this study's estimate of the volume of imports with import statistics from the Hong Kong Census and Statistics Department shows that official records for 1997 underestimate the trade by around 11 000 t. There are various reasons for the discrepancy. Where official records only show Indonesia and the Philippines as the countries of origin for Humphead Wrasse, traders noted that other exporting countries included Australia, China, Malaysia, the Maldives, Papua New Guinea, the Solomon Islands, Thailand, and Vietnam. Of concern is that exports of Humphead Wrasse from the Philippines are prohibited; specimens of a certain size are prohibited in exports from Indonesia, and the capture of this species and its export from the Maldives are also prohibited. Furthermore, fishing vessels and live fish transport vessels licensed in Hong Kong are exempt from declaration of such imports. Transport by sea, however, is still preferred for importation of the larger specimens of Humphead Wrasse and Giant Grouper because these species fare better than if transported by air.

Wholesale and retail prices

The total wholesale value of live reef fish imported into Hong Kong for food is estimated to exceed USD500 million a year, which far exceeds Hong Kong's total annual seafood production by its entire traditional capture fleet (Lee and Sadovy, 1998). The most highly valued fish are, in descending order, Giant Grouper, Humphead Wrasse, High-finned Grouper, Red Grouper and coral trouts *Plectropomus* spp. Wholesale prices in 1997 ranged from USD38/kg for Spotted Coral Trout to over USD100/kg for the smaller specimens of Giant Grouper. Retail prices ranged from around USD30/kg for a large Tiger Grouper, for example, to around USD175/kg for a small (<1 kg) Humphead Wrasse.

Concern over catch levels and methods of capture

Preference for smaller, sexually immature specimens, particularly of Giant Grouper and Humphead Wrasse, is an issue of great concern. Given the low density of species naturally occurring on coral reefs and

the large quantities of these fish in trade, current catch levels may not be sustainable. Fishing methods further exacerbate the situation: increased imports of certain groupers during the spawning season are indicative of fishers targeting spawning aggregations, which will have devastating effects on future stocks. Cyanide - used by fishers to stun the fish - also remains an issue of serious concern. The difficulty of catching certain species with hook and line, in particular Giant Grouper and Humphead Wrasse, increases the likelihood of cyanide being used and thus also increases the level of threat to these species as well as to non-targeted marine organisms including the coral reefs themselves. Giant Grouper and Humphead Wrasse are also particularly susceptible to stock depletion owing to their long life cycles and relatively small population sizes (Sadovy, 1998; Lee and Sadovy, 1998) and are already listed as Vulnerable in the IUCN Red List of Threatened Animals (Baillie and Groombridge, 1996).

Steps for improved control and management

While much of the work to ensure that the trade is kept within sustainable limits needs to be carried out by the supplying countries, Hong Kong and other consuming nations still have an important role to play. Based on the recommendations of the report, WWF Hong Kong and the Agriculture and Fisheries Department of the Hong Kong (SAR) Government are currently compiling an identification manual to assist government officers and traders in the recognition of fish species. WWF Hong Kong is also conducting attitudinal research to determine the most effective means of engaging the public in the protection of the coral reef habitats from which the fish are taken. Further recommendations of the report include a call for amendment of the current official trade monitoring system. Although Hong Kong already monitors imports of certain species of reef fish, the study found that trade records required amending in order to document other species commonly found in trade and which are subject to intense fishing pressure. This recommendation was put forward by TRAFFIC East Asia to the Hong Kong Government in late 1998 and has subsequently been implemented as of 1 January 1999. However, trade records will continue to underestimate the trade unless the licensing and classification system for locally registered fishing vessels and locally registered transport vessels bringing in live marine fish is amended, to enable recording of all imports into Hong Kong. Once a tighter monitoring system has been established in Hong Kong, the Hong Kong Government could consider sharing its expertise with other member-nations of APEC towards establishing a comprehensive and standardized system for monitoring trade of live reef fish in the region. Given that Hong Kong imports Humphead Wrasse from countries which have already banned exports of this species, these countries may wish to explore the possibility of a CITES Appendix II or III listing for this species, which would facilitate the Hong Kong Government's regulatory efforts.

Further research into hatchery-based mariculture should also be encouraged. Currently all mariculture operations, with the exception of those for certain groupers in Taiwan, are based upon grow-out of wild-caught juveniles. Properly managed mariculture - raising fry from eggs hatched artificially in captivity - could offer a partial solution to taking pressure off wild stocks. At the same time, well-managed wild fisheries could supplement supply from mariculture operations whilst providing a long-term, high value cash income for coral reef fishers. Pollution of mariculture zones, poor feed conversion rates and high use of wild fish in feed, however, are still issues that require attention before mariculture can provide a sound option.

On 30 July 1999 the Hong Kong Government announced that, in its efforts to combat destructive fishing practices, legislative amendments had been made to increase the maximum fine for fishing with explosives or toxic substances from HK$10 000 to HK$200 000 (USD1300 to USD25 765) under the *Fisheries Protection Ordinance*. The Hong Kong Government also stated that it would continue to participate in international fora such as APEC, in order to enhance international co-operation on this front (Secretary for Economic Services, Hong Kong Government, *in litt.,* 30 July 1999).

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Rob Parry-Jones, Programme Officer, TRAFFIC East Asia; Patrick P.F. Lau, Researcher, Department of Ecology and Biodiversity, University of Hong Kong.

[1]The Hong Kong Trade in Live Reef Fish for Food *by Patrick P.F. Lau and Rob Parry-Jones (1999), is published by TRAFFIC East Asia and WWF-Hong Kong. Limited copies are available from TRAFFIC East Asia and TRAFFIC International.*

Studies on Taiwan's aquaculture industry and trade in groupers, and of the live reef fish industry in Southeast Asia carried out by TRAFFIC East Asia and TRAFFIC Southeast Asia, respectively, will be completed later this year.

Australia Cuts "Finning"

In response to an apparent rise in shark fishing and in particular the practice of taking the fins only and discarding the rest of the fish, the Minister for Fisheries of New South Wales (NSW), Australia, Eddie Obeid, has imposed a ban on "finning" sharks. The new law applies to recreational as well as commercial fishers and requires that all sharks landed must have their fins attached, while it will be an offence for fishers to be in possession of detached shark fins in NSW waters. The legislation was drawn up with the support of the Advisory Council on Commercial Fishing and provides substantial penalties, including fines up to AUD110 000 (USD70 000) for offending corporations and up to AUD22 000 (USD14 000) for individuals, and/or six months in gaol.

Sandtiger Shark *Carcharias taurus* populations have still not recovered from the heavy impacts caused by spearfishers and fishermen in the 1950s and 60s, despite a 15-year ban on harvesting. These fish, known locally as Grey Nurse Sharks, have very low reproductive rates, even in comparison with many other shark species. A maximum of two pups are produced in as many years, the most advanced young eating remaining embryos and the developing eggs in utero, making for slow rebuilding of populations. In 1984, NSW was the first legislature in the world to list this species as protected, together with the Smalltooth Sand Tiger *Odontaspis ferox*, referred to locally as Herbsts Nurse Shark. Great White Sharks *Carcharodon carcharias* were subsequently listed in 1996 and more recently both Great White and Sandtiger Sharks have been listed as "vulnerable" under new threatened species provisions of the NSW *Fisheries Management Act*. This will afford them greater legal protection than previously and require that comprehensive plans for the recovery of these species be developed.

The NSW fisheries authorities will be urging both the national government and other Australian States and territories to adopt a comprehensive ban on finning sharks and the NSW Minister for Fisheries has also petitioned the Australian Government to ban imports of shark fins.

R. Bill Talbot, Principal Conservation Manager, Threatened Species, New South Wales Fisheries, in litt., *4 June 1999.*

< Shark fins are removed from the carcass as quickly as possible and are cut at the fin base. Freshly cut fins are cleaned and washed amd may be stored on ice, frozen, or dried immediately.

Photo: Elizabeth Hayes

< Processing shark fins in Western District, Hong Kong, the primary location of shark fin dealers in Hong Kong.

Hong Kong is renowned for its culinary tradition and skilful preparation of shark fin soup. It handles more than half of all recorded world imports of shark fins, dried or salted, which are imported from over 125 countries/areas. Much of the processing is carried out in China.

Photo: TRAFFIC/R. Parry-Jones

Call for Elephant Data

An *Ivory and Elephant Product Seizure Data Collection Form* was circulated to Parties by the CITES Secretariat for the purposes of monitoring illegal trade in ivory and other elephant products, as directed by Resolution Conf. 10.10 which instructs all Parties to "provide information about ivory seizures to TRAFFIC for inclusion in its database." These data - which, amongst other details, should include information relating to the type of ivory or elephant product seized, the date and location of the seizure, or activity being reported, the country of origin, country of export/re-export and country of destination/import - will be held as a component of the Elephant Trade Information System (ETIS) in order to monitor and record levels of illegal trade in ivory and other elephant products. To safeguard confidentiality and data integrity, all completed forms should be sent to the CITES Secretariat where they will be screened before being passed to TRAFFIC for inclusion in the database.

Any problems or questions relating to these forms should be directed to TRAFFIC East/Southern Africa (contact details back page) or the CITES Secretariat, 15 Chemin des Anémones, CH-1219, Châtelaine-Genève, Switzerland, Tel:+41 22 917 8139/40; Fax:+41 22 797 3417; Email: cites@unep.ch

CITES Secretariat, Notification to the Parties No. 1999/36, 30 April 1999

Experimental Sea Cucumber Fishery in the Galapagos

The Government of Ecuador opened the Galapagos sea cucumber fishery on an experimental basis from 1 April to 31 May 1999. Resolution No. 2 of the Management Authority of the Galapagos Marine Reserve established guidelines for the fishery and incorporated recommendations made by the Charles Darwin Research Station (CDRS) and recommendations resulting from TRAFFIC's study of the Galapagos sea cucumber trade (*TRAFFIC Bulletin* 17(3)). The results of TRAFFIC's study were presented to Ecuador's Minister of Environment in January 1999. Resolution No. 2 specifically requested TRAFFIC to assist in planning for more effective control of the trade.

Fishery and trade controls combined with a monitoring programme were called for under the Resolution to reduce the potential for unmanaged fishing on the scale that occurred when the fishery had last been opened, in 1994. The Galapagos National Park Service (GNPS), the Charles Darwin Research Station and the National Institute of Fisheries (INP) co-operated in establishing and implementing a monitoring and patrolling programme. The Ecuadorian Navy also assisted with patrolling.

CDRS organized the monitoring and evaluation of sea cucumber populations in 20 sites prior to the fishery's opening to establish baseline data. Fishermen from two local fishing co-operatives participated as did staff from INP and GNPS. GNPS and CDRS also trained and organized a team of volunteer observers who collected biological, catch and fishing effort data at processing camps, ports and on some fishing vessels. Fishermen were required to attend a training programme conducted by GNPS and CDRS and to obtain a special licence prior to participating in the fishery. Drying of sea cucumbers was restricted to selected sites. Sea cucumber shipments were counted upon being landed and certificates issued to confirm their legality. Fishermen were required to present these certificates to authorized traders at the time of sale. Traders seeking to ship sea cucumbers to the mainland were required to obtain a transport certificate from GNPS, which cargo companies, in turn, were required to ensure accompanied all sea cucumber shipments. Shipment to the mainland was allowed until 9 June.

Approximately 200 boats and 800 fishermen were involved in the two-month fishery and over four million sea cucumbers (approximately 122 t dry weight) were taken. Most specimens were shipped to the coastal port of Guayaquil following drying and processing.

Mainland trade controls for sea cucumbers are less comprehensive than those established in the Galapagos. Exporters seeking to export sea cucumbers must have been registered with the General Direction of Fisheries since 1994-95 and must have a general fisheries export permit. It appears that most exporters are using export permits obtained during 1994-95, as very few new permits have been issued since the opening of the Galapagos sea cucumber fishery. A recent change in export controls allows approval for the export of fish products and other goods to be obtained through private banks. Transport certificates must be presented when seeking approval for the export of Galapagos sea cucumbers. Export controls therefore rely primarily on the private banking sector being well informed, capable and willing to identify the requisite legal documentation, and to take appropriate action in the case of uncertainties. No deadline has been set for the onward export of Galapagos sea cucumbers from Ecuador.

At the request of the Ministry of Environment, TRAFFIC is collecting and analysing trade information and evaluating the effectiveness of the trade control system. A report on the results of this analysis and accompanying recommendations will be presented to the Government of Ecuador later this year. TRAFFIC is also assisting the government in their efforts to inform government agencies in major consumer markets regarding Ecuador's sea cucumber fishery and trade controls.

It is too early to assess fully the scale and impact of the experimental sea cucumber fishery in the Galapagos, the control of which benefited greatly from the participation of various institutions as well as local fishermen. Population monitoring undertaken before and after the fishery will also provide valuable information for evaluating the biological impact of the fishery and the development of future management plans.

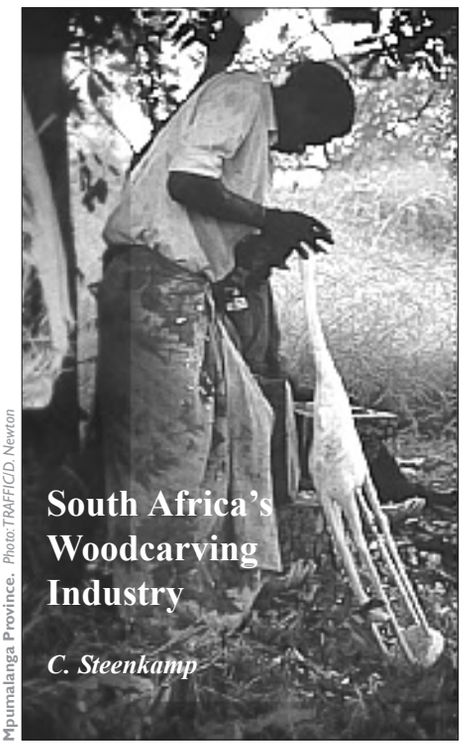
The Galapagos fishery may have had the unintended effect of increasing sea cucumber fisheries along the mainland, where no trade controls have been established and over-fishing has already significantly reduced sea cucumber populations. Small boats filled with sea cucumbers were observed in the vicinity of Machalilla National Park during the period in which the Galapagos fishery was open, although a coastal fishery had not been opened according to the Director of Fisheries.

Research thus far indicates that existing export controls may not be sufficient to prevent sea cucumbers from being exported without proper documentation. The lack of a deadline for the export of Galapagos sea cucumbers could allow the entry into trade of Galapagos sea cucumbers fished outside the agreed fishing season, or for sea cucumbers from the coast to be exported using Galapagos transport certificates. TRAFFIC has therefore recommended that the government set a final deadline for the export of Galapagos sea cucumbers.

Teresa Mulliken, Research and Network Development Manager, TRAFFIC International

Sources: La Pesca de Pepino de Mar en Galápagos: Periodo Abril-Mayo 1999*, prepared by Área de Investigaciones Marinas y Conservación Costera de la Estación Cientifica Charles Darwin, Unidad de Recursos Marinos del Parque Nacional Galápagos and the División de Biología y Evaluación de Recursos Pesqueros del Instituto Nacional de Pesca; Charles Darwin Foundation; Macarena Green and Anita Sancho on behalf of the TRAFFIC South America Project Office.*

TRAFFIC's current work on sea cucumbers is supported by World Wide Fund for Nature (WWF) UK.



Carving a giraffe from Kiaat *Pterocarpus angolensis*, at a co-operative carving venue near Hazyview, Mpumalanga Province. *Photo:TRAFFIC/D. Newton*

South Africa's Woodcarving Industry

C. Steenkamp

South Africa's woodcarving industry has grown in recent years with the lifting of trade embargoes following political change in that country and the associated rise in tourists. However, while South Africa is a producer of woodcarvings, imports dominate the market: in 1995 these originated from 19 other African countries, in particular Malawi, and amounted to an estimated 620 tonnes; domestic production utilizing South African tree species was about 293 tonnes. Responding to concern about the effect of this trade on South Africa's tree species, TRAFFIC set out to examine the size and nature of this industry and to determine its impact on natural forests and individual species within the country. Findings of the 1995 study are presented below. The cumulative effects of pressure of the woodcarving industry on individual indigenous species, and the effects of tourism and other uses, such as firewood, home construction and the furniture industry, need further examination.

Introduction

Woodcarving in South Africa has in the past largely been a traditional activity geared towards production of utilitarian items such as spoons, bowls, walking sticks and objects of religious significance. In recent decades the industry has expanded to include production of ornaments and figurines (curios) destined for sale to the tourist market. The lifting of trade embargoes following political change in South Africa, and the associated rise in the number of tourists, has acted as a stimulus to this industry, as evidenced by increased importation of woodcarvings from throughout Africa. As the industry expands, and demand increases, concern about the conservation status of South African tree species has grown.

A number of studies have been carried out in recent years in order to address this issue (Shackleton, 1993; Anon., 1994; Clark and Magagula, 1994). In 1995 TRAFFIC East/Southern Africa undertook a review of South Africa's woodcarving industry in order to determine which species appear in trade and which of these are of South African origin, and to gain an understanding of the dynamics of the industry.

Methods

The survey was undertaken over a period of six months in 1995 and formed a component of a broader TRAFFIC study of South Africa's timber trade. The survey was limited to an examination of carvings entering the cash economy, thereby omitting household utensils. The study was further limited by excluding furniture. Following a review of literature, field research was conducted, primarily in the provinces of Gauteng, Northern, Mpumalanga, KwaZulu-Natal, Western Cape, Eastern Cape and Free State.

Estimates of the volume of woodcarvings traded and the prevalence of selected species in trade in South Africa were derived from visits to areas of production and sale, and interviews with people associated with the trade. Specifically, 52 carvers, 200 roadside/market vendors, two distributors, four wholesalers, 63 shop owners and six factory managers were interviewed. An additional 205 telephone interviews were conducted countrywide with individuals in the industry and government employees to ascertain the extent of woodcarving activities in South Africa. Both structured (using a standard questionnaire) and unstructured interviews were held with carvers, vendors and shop/factory managers to gather data on industry dynamics. Volume information was collected by quantifying stock in selected shops, stalls and roadside stands. In the urban areas, three shops and 10 stalls were surveyed and the weight, prices and species identification of all stock were recorded. In the rural areas, stock quantification was carried out for one shop and one stall in Northern Province, four shops and 10 stalls in Mpumalanga, and 10 shops and 15 stalls in KwaZulu-Natal. Volumes of imports were obtained from official import statistics.

Species identification was achieved where possible by timber experts. In some cases microscopic analysis of anatomical structure was required for accurate identification; wood samples were collected and identification was carried out by charcoal technique in the Department of Archaeology, Witwatersrand University. In addition, common names of woodcarving species were recorded, and cross-checked against published accounts of species in trade and collected wood samples.

Evaluation of species occurring in South Africa was carried out to ascertain conservation priorities. Four selection criteria were considered in this exercise. These are qualitative, rather than quantitative, yet nevertheless represent an attempt to link consumption data with information on biology and distribution. The criteria

Map of South Africa showing the principal survey sites.

were: 1) frequency of appearance in trade; 2) tree growth rate; 3) area of natural distribution in South Africa; and, 4) ease of availability as reported by carvers, i.e. whether the species was reported by carvers as being difficult to obtain. Calculation of the frequency of appearance in trade was based on presence in shop stock surveys: a species appearing in 0%-25% of the samples labelled was classified as "low" frequency, in 25%-50% of the samples as "medium", in 50%-75% of the samples as "high", and in 75%-100% of the samples as "very high". This method was selected owing to insufficient data on the status of populations in the wild and as an attempt to ascertain the potential conservation impact. The exchange rate used in this report is ZAR3.50 to the US dollar.

South Africa's Woodcarving Industry

This survey revealed the existence of a rapidly changing, complex industry, characterized by various forms of interaction between formal sector (shops, factories) and informal sector material (roadside stalls, flea markets), sourcing, production, distribution (including importation and export), and sales.

Domestic production

South Africa is both a producer and an importer of woodcarvings, with imported carvings dominating the trade. South African production is quite variable, in that carvings are produced using low technology methods and in settings that have minimal overheads by individual carvers or small groups (referred to in this article as the informal sector), as well as in large-scale commercial factories where carvings are often made by machine (formal sector). Informal sector production occurs primarily in the rural parts of the Northern Province, Mpumalanga and KwaZulu-Natal, in particular in the former homelands such as Venda, Lebowa, KwaZulu, Gazankulu, KaNgwane and KwaNdebele, and also in the urban centres of Johannesburg, Durban and Pietermaritzburg. Formal sector production is found primarily in the urban areas of Gauteng and KwaZulu-Natal, namely Johannesburg and Durban respectively. Some factories, notably those in Nelspruit in Mpumalanga Province and Knysna in Western Cape Province, are so located owing to their proximity to the resource. A number of factories exist where carvings are mass-produced, frequently using machines. During this survey, at least 10 factories were identified, as were numerous workshops where carvings are made (Table 1).

Woodcarvers in South Africa are predominantly male, with women generally playing a minor role in production. Few woodcarvers have formal training, and skills are generally acquired through apprenticeships. Some handicraft societies offer training positions (Clark and Magagula, 1994). Carving is not the first choice of employment of most people interviewed, however. Fifty-eight percent of the carvers interviewed in KwaZulu-Natal and 80% in KaNgwane (Mpumalanga Province) indicated that they would prefer alternative forms of employment. The average monthly income for a carver in KaNgwane and KwaZulu-Natal was found to be ZAR700 (USD200) and ZAR650 (USD185) respectively. Carvings are fashioned with tools such as knives, branding irons, axes, handsaws, chisels, and hammers, and are polished and finished with files, sandpaper, spray paints and colourants. Many woodcarvers do not own tools, but borrow them from friends and relatives. A wide range of products is produced: functional items including spoons, ladles and bowls as well as animal figurines ranging in size from a few centimetres to 1.5 metres.


WWF/Alan Hamilton

Zebrawood *Dalbergia melanoxylon* is one of the most valuable species in Africa for woodcarving.

Province	Presence of factories/workshops producing woodcarvings
Mpumalanga	At least two medium-sized factories in the vicinity of Nelspruit; smaller workshops may be active elsewhere in the province.
Northern	Possible existence of a small factory in KwaNdebele.
Gauteng	At least two large factories and ten workshops.
KwaZulu-Natal	At least one large factory and several small workshops near Durban.
Eastern Cape	At least three large factories operating near Knysna.
Western Cape	No factories identified; possible existence of workshops.
Free State	No factories identified; possible existence of workshops.
Northern Cape	No woodcarving activity; not a traditional carving area.
North West	No woodcarving activity; not a traditional carving area.

Table 1. Woodcarving factories and workshops in South Africa, 1995.

Province	No. of shops counted	No of shops estimated
Gauteng	30	90
Northern	3	23
North West	0	15
Mpumalanga	52	70
KwaZulu Natal	63	115
Free State	8	15
Northern Cape	0	10
Eastern Cape	3	15
Western Cape	18	56
Total	**177**	**409**

Table 2. Observed and estimated number of medium to large curio shops in South Africa, 1995.

Woodcarving factories manufacture a range of products including painted birds, large animal carvings, cheeseboards, place mats, trays, candleholders, clocks, lamps, wall plaques, bookends, paperweights, pencil holders, eggs, bangles and a variety of beaded or plain spears and walking sticks. This product range overlaps only marginally with what is produced by informal sector woodcarvers.

Marketing

Carvers: In relation to woodcarvers, two marketing strategies have been observed, the first being that of "carver-vendor production", in which most production and sale takes place alongside the main tourism routes. In this case, facilities are generally unmechanized, and production is carried out on an individual basis or by small, informal groups of carvers using hand tools. In Mpumalanga and KwaZulu-Natal Provinces, carvers specialize in animal figurines, especially birds and antelopes, although along the main road between Jozini and Sodwana, carvers produce walking sticks and bowls. Sales are primarily made at key locations such as the Numbi gate to Kruger National Park, and at sites such as this sales activities are often controlled by carvers and vendors working in co-operation.

TRAFFIC/N. Marshall

Chopping wood at a woodcarving co-operative in Kenya.

The second marketing strategy is that of the "home carver", and is generally the most frequent strategy employed in the remote rural areas with difficult access to markets. It occurs in Venda, Mpumalanga and KwaZulu-Natal. Carvers work full- or part-time at home producing functional items such as bowls, walking sticks and cooking utensils. In some areas many of these items are produced for use by the community. Often the carving operation is a family business with a well-developed division of labour between different family members, with men carving the wood, and women polishing and finishing the carvings.

Rural carvers generally acquire wood from communal land, private farms and municipal dumps, while factories and workshops get required wood from communal and private land, and the commercial trade which provides a reliable source of sufficient amounts of wood on a regular basis.

TRAFFIC/N. Marshall

A woodcarver in Mombasa, Kenya. About 20% of all woodcarvings on sale in South Africa in 1995 had been produced in Kenya.

Nationality	No. of Vendors	Comments
Malawi	30	
Zimbabwe	19	20% were female
Democratic Republic of Congo	23	
South Africa	13	About half were female
Kenya	10	
Swaziland	8	Half were female
Uganda	6	
Cameroon	5	
Ghana	3	
Côte D'Ivoire	2	
Benin	1	
Tanzania	1	
Mozambique	1	An underestimate; many declare themselves as Swazi
Zambia	1	
Total	**123**	

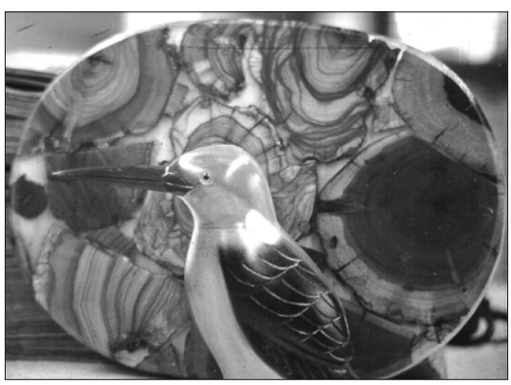
Table 3. Nationality of vendors in six flea markets in Johannesburg and Pretoria, 1995.

Vendors: There are notable differences in the gender of rural- versus urban-based vendors, with a prevalence of women in the rural areas. In Mpumalanga, eight vendors were interviewed at their sites of business which were at tourist attractions such as Bourkes Luck, God's Window and Mac-Mac Falls. All vendors were female, with no men encountered. This situation contrasts with urban selling, in which men predominate. The ages of vendors and the number of years in the profession varied by region. In areas such as Mpumalanga where roadside selling was only recently legalized, the vendors tended to be between 19 and 41 years, each with approximately two to eight years in the business. In KwaZulu-Natal where roadside selling has been practised for a longer period of time, the vendors were correspondingly older (28 to 55 years), with about four to 23 years each in the business. Vendor backgrounds also varied considerably by region, and often reflected different socio-economic conditions. Out of a group of 20 roadside vendors interviewed during this survey (eight at God's Window and Mac-Mac Falls in Mpumalanga, and six each at St. Lucia and at the Durban beach front, KwaZulu-Natal Province), five were previously unemployed. The other 15 either were involved in home industries (sewing, growing/selling vegetables), or were employed in the formal sector (such as in a school). Eighty percent of the female vendors expressed high or very high job satisfaction. Two of these women interviewed in Durban gave as a reason for their satisfaction the resulting economic independence from men. In contrast to this, the generally higher levels of competition amongst vendors in urban areas resulted in more stress and less job satisfaction.

A total of 299 vendors were recorded as belonging to seven hawkers' associations, the largest being Salubindza with 117 members. All roadside vendors interviewed in Mpumalanga belonged to hawkers' associations; these had been established and organized by the KaNgwane Development Corporation. Nevertheless, numerous vendors are not part of an association, or sell their products where associations have not yet been set up, hence it is difficult to ascertain how many vendors are operating in each region.

Woodcarvings are also marketed through flea markets, and retail shops of various sizes. During this survey a total of 177 medium to large curio and arts and crafts shops were observed, and a total of 409 are estimated to exist, taking into consideration the presence of large urban areas, tourism routes and game reserves in each province (Table 2). This figure does not include shops which only sell woodcarvings as a small part of their overall stock. It should be noted that a category of very small shop exists, and it is estimated that they number approximately 440.

A presence of foreign vendors was noted during interviews in flea markets, especially in the large urban centres such as Johannesburg and Durban. Some 51 (of 123) foreign vendors were counted in six flea-markets in Johannesburg and Pretoria (Table 3). These markets were revisited three months later, and although changes had taken place with regard to individual vendors, the distribution of nationalities remained similar.



Photos: TRAFFIC/D. Newton

Nest of carved wooden birds awaiting their paint feathering, at the roadside near Numbi Gate, Kruger National Park (top); a factory-produced wooden kingfisher, and mat derived from Wild Olive *Olea europaea africana*, on sale in a curio shop, Kruger National Park.

Category	Northern Province	Lebowa (Northern Province)	Gazakulu (Northern Province)	KaNgawa (Mpumalanga Province)	KwaZulu Natal Province	Total
Top artists	12	3	2	2	4	23
Full-time artists (middle range)	17	3	4	4	18	46
Part-time artists	25	-	-	-	32	57
Home-carvers (full-time)	22		14	-	25	61
Home-carvers (part-time)	11	10	6	8	20	55
Carver-vendors (full-time)	-	-	-	70	80	150
Carver-vendors (part-time)	-	-	-	29	56	85
Total	**87**	**16**	**26**	**113**	**235**	**477**

Table 4. Estimated number of woodcarvers in selected locations in South Africa, 1995. - = *not applicable or data not available*

Category	Northern Province		Lebowa (Northern Prov.)		Gazakulu (Northern Prov.)		KaNgawe (M'langa Prov.)		KwaZulu Natal Prov.		Total used
	income	ratio	income	ratio	income	ratio	income	ratio	income	ratio	(kg)
Top artists	889	400	134	350	90	350	90	350	55	450	3 242
Full-time artists (middle range)	273	110	28	130	38	130	38	130	141	173	4 097
Part-time artists	108	68	-	-	-	-	-	-	101	80	2 851
Home-carvers (full-time)	94	46		11	52	11	-	11	110	26	11 001
Home-carvers (part-time)	19	46	12	11	7	11	9	11	99	26	6 766
Carver-vendors (full-time)	-		-	-	-	-	705	88	748	43	25 407
Carver-vendors (part-time)	-		-	-	-	-	93	88	152	43	4 592
Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**57 956**

Table 5. Estimated total incomes (in '000 Rand) and value to weight ratios of woodcarvings (Rand per kg), and estimated weight of wood used by informal sector carvers. - = *not applicable or data not available*

Volume of wood used in the industry

The timber used for woodcarvings produced in South Africa is from South African trees. In order to quantify the wood used to produce such carvings, analysis was undertaken of the estimated number of carvers, the amount of material used by carvers of varying status (i.e. part-time carvers, master carvers, etc.), and the quantity of woodcarvings traded through selected shops and stalls.

The volume of wood used by informal sector carvers was calculated by estimating the number of woodcarvers (Table 4), their total incomes, and by using value to weight ratios divided into the total income (per producer category) generated to obtain a figure for total resource consumption (Table 5). The total amount of wood consumed was found to be approximately 58 000 kg; this figure represents the weight of the woodcarvings themselves, rather than the actual weight of wood at harvest. This figure therefore also excludes wastage during carving. It can be assumed that the actual amount of material used is much higher.

In order to ascertain the quantity of woodcarvings produced by factories, which can be distinguished from those produced by hand, shops of varying sizes were visited, and all stock described and weighed. Examples of the contents of two shops are presented in Tables 6 and 7.

Source	kg	%	Value (ZAR)	%
Formal sector	322	52	51 958	54
Informal sector	51	8	4 782	5
Imported	250	40	38 841	41
Total	**623**	**100**	**95 581**	**100**

Table 6. Weight and value of woodcarvings appearing in a large retail outlet in South Africa, 1995.

Source	kg	%	Value (ZAR)	%
Formal sector	21	33	1 042	21
Informal sector	5	8	375	7
Imported	38	59	3 644	72
Total	**64**	**100**	**5 061**	**100**

Table 7. Weight and value of woodcarvings appearing in a small retail outlet in South Africa, 1995.

Common Name	Scientific Name	N	M	K	Frequency of appearance Informal sector	Factory
Flame Acacia	*Acacia ataxacantha*		x		low	-
Knob-thorn	*Acacia nigrescens*		x	x	medium-high	-
Bottlebrush Aloe	*Aloe rupestris*			x	low	-
Pod Mahogany	*Afzelia quanzensis*	x	x	x	high	-
Poison-pod Albizia	*Albizia versicolor*	x	x	x	medium	-
Sickle-leaved Albizia	*Albizia harveyi*	x			low	-
Lebombo Ironwood	*Androstachys johnsonii*	x	?		low	medium
White Pear	*Apodytes dimidiata*		x		low	-
Torchwood	*Balanites maughamii*			x	low	-
Bird Plum	*Berchemia discolor*		x		low	-
Red Ivory	*Berchemia zeyheri*	x	x	x	medium	very high
Wild Silver Oak	*Brachylaena elliptica*			x	low	-
Matumi	*Breonadia salicina*		x		low	-
Witolienhout	*Buddleja saligna*		x		low	-
Red Syringa	*Burkea africana*	x			low	-
Bastard Tamboti	*Cleistanthus schlechteri*			x	very high	-
Mopane	*Colophospermum mopane*	x			high	-
Red Bushwillow	*Combretum apiculatum*			?	-	low
Leadwood	*Combretum imberbe*	x	x		low	-
Zebrawood	*Dalbergia melanoxylon*	x	x	x	medium	-
Sickle Bush	*Dichrostachys cinerea*		x		low	-
Jackalsbessie	*Diospyros mespiliformis*		x	x	medium	-
Wild Pear	*Dombeya rotundifolia*		x		low	-
Cape Ash	*Ekebergia capensis*			x	low	high
Lucky-bean Tree	*Erythrina lysistemon*		x		low	-
Myrtle	*Eugenia capensis*			?	?	-
Red-leaved Rock Fig	*Ficus ingens*			x	low	-
Sycamore Fig	*Ficus sycomorus*	x	x	x	medium	-
Large False Mopane	*Guibourtia coleosperma*	x			low	-
Red Heart-fruit	*Hymenocardia ulmoides*				x	medium -
Wild Peach	*Kiggelaria africana*		x		low	-
Live-long	*Lannea discolor*		x		low	-
Umzimbeet	*Millettia grandis*			x	low	-
Lebombo Wattle	*Newtonia hildebrandtii*			x	medium	-
Black Stinkwood	*Ocotea bullata*				-	medium
Wild Olive	*Olea europaea* ssp. *africana*	x	?	x	medium	very high
Wild Olive	*Olea* spp.				?	-
-	*Platylopus trifoliatus*				-	low
Yellow Wood	*Podocarpus falcatus*				-	medium
-	*Ptaeroxylon obliquum*				-	medium
Kiaat, Mukwa	*Pterocarpus angolensis*	x	x	x	very high	-
-	*Pterocarpus tricuspidatus*				-	low
-	*Rapanea melonophloeos*				-	low
Weeping Boer-bean	*Schotia brachypetala*		x		medium	-
Marula	*Sclerocarya birrea* ssp. *caffra*	x	x	x	very high	-
Tamboti	*Spirostachys africana*	x	x	x	very high	very high
Water Berry	*Syzygium cordatum*		x	x	very high	-
Silver Terminalia	*Terminalia sericea*	x	x		low	-
Pigeonwood	*Trema orientalis*		x		low	-
Small Trichilia	*Trichilia dregeana*			x	very high	-
Natal Mahogany	*Trichilia emetica*		x	x	very high	-
Saddle Pod	*Wrightia natalensis*			x	high	-
White Ironwood	*Vepris undulata*			x	low	-
Eucalyptus	*Eucalyptus saligna**			x	low	-
Jacaranda	*Jacaranda mimosifolia**	x	x	x	high	-
Persian Lilac	*Melia azedarach**		x		medium	-
Pine	*Pinus* spp.*	x		x	low	medium
Bugweed	*Solanum mauritianum**			x	low	-
Railway sleepers*	Various spp.	x		x	low	-

Table 8. Species utilized by woodcarvers in South Africa, with indications of frequency of appearance in Northern Province, Mpumalanga Province and KwaZulu-Natal Province, and in factory and workshop production, 1995.

(N = Northern Province; M = Mpumalanga Province; K = KwaZulu-Natal Province).

*Note: * indicates an alien species; all other species are indigenous to Africa. All species lacking an indication of Province were found in formal sector factories.*

- = not applicable or data not available

Shop Size	Display stock (kg)	Turnover rate	Annual consumption (kg)	No. of shops	Total consumption (kg)
Large	322	15	4 830	22	106 260
Medium	151	10	1 510	66	99 660
Small	21	8	168	110	18 480
Very small	5	5	25	440	11 000
Total					**235 400**

Table 9. Estimated quantity of woodcarvings produced by the formal sector in South Africa, 1995.

As it was not possible to establish the total number of curio shops, a 22:66:110 distribution of large, medium, and small retail outlets was estimated based on the number of shops counted during field trips. Although it is estimated that approximately 409 medium to large retail shops exist (Table 2), only 50% of the 177 shops visited were found to sell products made in factories and workshops. Hence, the number of small, medium and large shops were reduced to a conservative 198 for calculations represented in Table 9. Based on an assessment of the stock, and a stock turnover rate of 15 times per year, it can be estimated that the amount of factory and workshop-produced woodcarvings totals at least 235 000 kg (Table 9).

It is known that South Africa exports woodcarvings, however this aspect of the industry was not investigated. Nevertheless, the 293 400 kg consumed by the formal and informal sectors can be regarded as the minimum amount of wood derived from indigenous South African and exotic trees used in South Africa's woodcarving industry, and the actual amount is likely to be significantly higher. This figure represents the weight of carvings sold, and excludes wood lost during harvest and manufacture. This figure comprises estimates of wood used by carvers operating in the informal sector, and estimates of factory-produced stock found to be on sale in retail outlets.

Country of export	Imports (kg)	% of total
Malawi	190 650	31
Kenya	120 585	20
Swaziland	72 358	12
Mozambique	50 094	8
Zaire (Dem. Rep. of the Congo)	44 528	7
Zimbabwe	38 962	6
Cameroon	38 428	6
Côte D'Ivoire	31 680	5
Other (11 countries)	33 052	5
Total	**620 337**	**100**

Table 10. Quantity of woodcarvings imported through Johannesburg International Airport, 1995.

Source: Cargo data, Johannesburg International Airport

Imports of woodcarvings into South Africa

The industry is growing, owing to increased trading operations, increased imports, as well as an increased number of African visitors who arrive with items that they can sell while in South Africa. Woodcarvings make up a significant portion of souvenir imports, and it has been surmised that this is because carving for the curio market is not widely practised in South Africa (Anon., 1992). No uncarved wood arriving in the country for the woodcarving industry was uncovered during the survey, although on occasions semi-completed articles are imported. South Africa imports woodcarvings from numerous African countries, and during this survey a total of 19 countries were recorded as exporters of woodcarvings to South Africa. Numerous countries have long histories of producing carvings for the tourist

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Many woodcarvings on sale in South Africa have been imported from Mozambique. Items displayed here, on sale in Maputo, are probably derived from Zebrawood *Dalbergia melanoxylon* and Tamboti *Spirostachys africana*.

Species		Frequency of appearance on sale	Natural distribution in South Africa	Growth rate	Availability reported by carvers
Knob-thorn	*Acacia nigrescens*	medium-high	narrow	fast	unknown
Pod Mahogany	*Afzelia quanzensis*	high	narrow	medium	medium-high
Poison-pod Albizia	*Albizia versicolor*	medium	narrow	fast	unknown
Lebombo Ironwood	*Androstachys johnsonii*	medium	narrow	slow	low
Red Ivory	*Berchemia zeyheri*	medium-very high	narrow-medium	very slow	low
Bastard Tamboti	*Cleistanthus schlechteri*	very high	very narrow	slow	high
Mopane	*Colophospermum mopane*	high	very narrow	medium-fast	unknown
Zebrawood	*Dalbergia melanoxylon*	medium	very narrow	slow	low-medium
Jackalsbessie	*Diospyros mespiliformis*	medium	very narrow	medium-fast	unknown
Cape Ash	*Ekebergia capensis*	high	medium	medium	unknown
Sycamore Fig	*Ficus sycomorus*	medium	narrow	fast	unknown
Red Heart-fruit	*Hymenocardia ulmoides*	medium	narrow-very narrow	slow	unknown
Lebombo Wattle	*Newtonia hildebrandtii*	medium	very narrow	slow	high
Black Stinkwood	*Ocotea bullata*	medium	narrow	slow	low-medium
Wild Olive	*Olea europaea* ssp. *africana*	medium-very high	wide	slow	low
Yellow Wood	*Podocarpus falcatus*	medium	medium	fast	unknown
-	*Ptaeroxylon obliquum*	medium	medium	medium-fast	unknown
Kiaat, Mukwa	*Pterocarpus angolensis*	very high	narrow	medium	low-medium
Weeping Boer-bean	*Schotia brachypetala*	medium	narrow	fast	unknown
Marula	*Sclerocarya birrea* ssp. *caffra*	very high	wide	medium	medium-high
Tamboti	*Spirostachys africana*	very high	wide	medium	high-low
Water Berry	*Syzygium cordatum*	very high	wide	fast	unknown
Small Trichilia	*Trichilia dregeana*	very high	narrow-medium	medium	medium-high
Natal Mahogany	*Trichilia emetica*	very high	narrow-medium	medium	medium-high
Saddle Pod	*Wrightia natalensis*	high	narrow	unknown	unknown

Table 11. **Wood carving species that occur in South Africa and identified as being of possible conservation concern in that country.**

Note: Natural distribution is defined as follows: very narrow = limited/marginal distribution in one or two provinces. These species are either at the extreme limit of their southerly range within South Africa or are local endemics; narrow = distribution is limited to one or two provinces but within those provinces it may be common; medium = species is distributed in three to five provinces; wide = occurs throughout South Africa in between six to nine provinces. *Source: Palgrave, 1983; Pooley, 1994; Venter and Venter, 1996.*

market (Elkan, 1958; Troughear, 1987), and are notable for good quality carvings which are often regarded as being superior to South African carvings. Efforts are being made to improve the quality of South African carvings through small enterprise development activities (Venter *et al.*, 1994), but at present imports remain important in the South African market. A review of cargo imports into Johannesburg International Airport revealed that in 1995 the top three exporters of woodcarvings were Malawi, Kenya and Swaziland (Table 10). Johannesburg is the main entry port for air cargo into South Africa.

Most imports of woodcarvings from East Africa (Kenya, Tanzania and Uganda) are thought to arrive by air into South Africa, in shipments ranging from 30 kg to 3000 kg. The proportion of any goods entering the country by sea through other ports, such as Durban and Cape Town, is unknown. Goods from southern Africa, as well as those from the Democratic Republic of Congo, are imported by air and by road. Minimal data exist to quantify or verify imports by road from neighbouring countries known to have significant woodcarving industries, in particular Malawi and Mozambique. As regards imports from the Democratic Republic of Congo (typically, masks and ceremonial items), in the past these were generally produced for traditional use. However, reproductions of such items manufactured in that country have been observed in tourist markets in South Africa and elsewhere on the continent, in particular Kenya.

Airport cargo data (Table 10) and Customs and Excise data on woodcarving imports were compared but were found to be incomplete in that Customs data consistently provided import volumes an order of magnitude lower than air cargo information. For example, in 1993, Customs reported that 42 721 kg of carvings valued at ZAR402 932 were imported, and that in 1994, 38 693 kg valued at ZAR331 263 were imported. For the period January to May 1995, a total of 56 118 kg of woodcarvings valued at ZAR456 722 were recorded as imported into South Africa. While complete Customs data for 1995 and other years were not obtained, it is evident that imports are not adequately reported.

South African species in trade

Examination of the trade in rural and urban areas in South Africa revealed that different species are utilized by different sectors. In samples taken within the South African informal sector, it was found that carvers used 45 species indigenous to Africa, and four alien species. Also identified was the genus *Pinus*, and wood sourced from railway sleepers. The source of the sleepers is

unknown, however it has been reported that in the past railway sleepers were imported from abroad and in particular from Australia. Two non-tree species, namely aloe *Aloe rupestris,* and *Solanum mauritianum* (an invasive plant known as "bugweed") were also used. This broad array of species differs to that used in South Africa's formal sector; only 12 indigenous species and one alien genus were found, although it is likely that additional species are used. This distinction between species utilized by the formal and informal sectors demonstrates that the formal sector has a preference for the attractive and valuable species, such as Red Ivory *Berchemia zeyheri* and Wild Olive *Olea europaea* ssp. *africana* (Table 8). While attempts were made to identify woodcarvings made from species exotic to South Africa, these have been omitted from the following section as the focus of the report is on species occurring in South Africa.

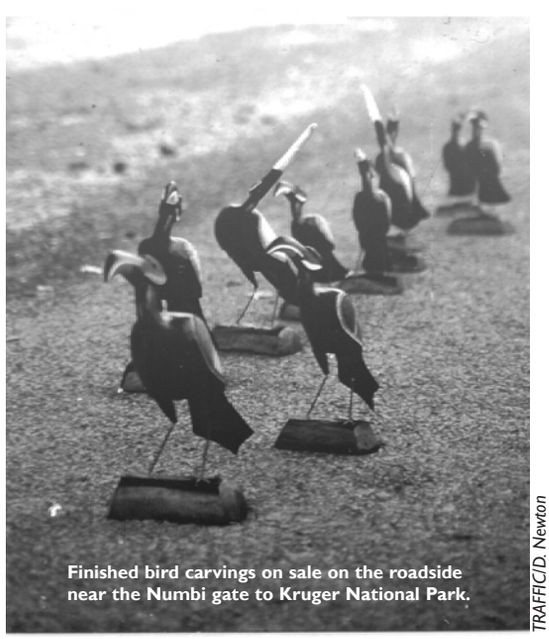
Conservation issues

Wood resources in South Africa are under pressure for a variety of reasons. Conversion of land for agriculture, as well as exploitation for fuelwood, charcoal, construction and other uses represent competing interests that woodcarvers must contend with when attempting to secure a reliable and regular source of raw material. While it is apparent that the South African woodcarving market is supported by significant imports of carvings from other African countries, South Africans are also involved in producing carvings, and there is every indication that the number of carvers practising will increase. Species occurring in South Africa and found to be valued in the woodcarving industry have been evaluated in order to ascertain which species should be regarded as conservation priorities in South Africa. Species with a medium to high frequency of appearance in trade, a slow growth rate, and a limited natural distribution in South Africa, are presented in Table 11. It should be noted that those with a limited natural distribution in South Africa may have a wider distribution on the continent. However, the aim of this analysis was to identify species in South Africa that may be under pressure and to identify local conservation priorities. The researchers also recorded whether the species was regarded by carvers as being of low, medium or high availability. This criterion is more difficult to evaluate, as low availability could indicate intensive exploitation, while high availability could indicate intensive exploitation and scarcity in the future. Further research is required on the population status of each species in South Africa.

Previous research confirms that a number of the above-mentioned species are prevalent in the woodcarving industry in South Africa. In a 1993 survey, Shackleton (1993) noted that in Northern Province, widely used woodcarving species included Kiaat *Pterocarpus angolensis*, Zebrawood *Dalbergia melanoxylon,* Wild Olive *Olea europaea* ssp. *africana,* and Tamboti *Spirostachys africana*; these species were found to be used by 100% of the woodcarvers in the study area (Bushbuckridge). Perceptions of scarcity differ, however. In a 1994 study looking at indigenous plant use in northern KwaZulu-Natal, individuals at roadside stalls on the route between Jozini and Mbazane were questioned about perceptions of availability of the wood resource. In general, it was felt that there was no shortage of wood for carving, although preferred species were not available in all locations. Harvesting was not cited as a reason for the absence of trees, rather that there were natural variations in the vegetation (Cleminson *et al.*, 1994).

Conclusions

The woodcarving industry in South Africa holds financial benefits for people of many nationalities, and represents a major source of income for informal and formal sector traders and producers alike. This study provides an indication that use of certain species in the industry is high, and that a number of these species have slow growth rates and a limited natural distribution in South Africa. Given that tourist arrivals are expected to increase in South Africa, and that demand for curios will similarly increase, there may be a need to examine the status of the woodcarving resource with the aim of ensuring sound management and conservation of these species. Future research on this issue should take into consideration the need to focus on management of popular, valuable and heavily traded woodcarving species, in order to ensure a sustainable future for this industry.



Finished bird carvings on sale on the roadside near the Numbi gate to Kruger National Park.

TRAFFIC/D. Newton

ACKNOWLEDGEMENTS

The author would like to thank E. Tancred, S. Dludlu, S. Eber and M. Esterhuisen for their assistance with gathering trade data and market information. Thanks are also owed to the South African Forestry Company Ltd (SAFCOL) who sponsored the project on which this article is based, and Mazda Wildlife Fund for providing a vehicle for the field research. David Newton, National Representative of TRAFFIC East/Southern Africa-South Africa commissioned the research, provided logistical and supervisory support and together with the author produced the various research reports upon which this paper is based. Nina Marshall, Deputy Director of TRAFFIC East/Southern Africa, provided enormous assistance with the writing and editing of this paper.

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C. Steenkamp, a Ph.D student in Social Anthropology, is an independent consultant.

Wildlife Trade in Yunnan Province, China, at the Border with Vietnam

Li, W. and Wang, H.

Despite improvement in recent years in the regulation of wildlife trade in Yunnan Province along southern China's border with Vietnam, there are significant deficiencies in wildlife trade management, particularly the short supply and poor motivation of relevant government personnel, and poor targeting of public awareness initiatives. These shortcomings, identified during a study of wildlife trade in the region in 1997, may have been exacerbated by the changes the authors found had occurred in market demand, methods of transportation and transactions, and in the function of open markets since previous surveys were undertaken in the region three years earlier. Implementation of legislation was also found to be seriously lacking. The discovery, in July 1999, that a large network of smugglers has been involved in dispatching wildlife specimens and products through the post, and the recovery of thousands of such items, illustrates how current the problem is. If this trade is to be controlled effectively, as a minimum technical and financial resources must be increased, and training provided to wildlife officials and those responsible for market management, transportation, public security and border control.

Introduction

The escalation of trade in wildlife along southern China's border with Vietnam in the early 1980s following a growth in China's economy and a rising human population, placed great demands on the region's wildlife (Chen *et al*., 1994). Although trade controls on both sides of the border were strengthened earlier this decade (Wang Sung, pers. comm.), conservationists have expressed concern about the effectiveness of such controls in Yunnan Province (Chen *et al.,* 1994; Li *et al*., 1996). This report documents the results of a survey carried out in 1997 to examine the trade and identify any deficiencies in the management of the region's wildlife resources and to assess any changes that may have taken place since earlier surveys were conducted in the region (Li *et al.,* 1996).

Background

The border region of Yunnan Province with Vietnam supports some of the richest flora and fauna in Asia (Chen *et al.,* 1994). Situated in south-west China, in the subtropical and northern tropical zone, Yunnan Province borders Sichuan Province in the north, Tibet in the west, Vietnam in the south, Guangxi Autonomous Region in the east, and Guizhou Province in the north-east. Owing to a lack of contact and communication with the west, and a poor road and transport system, the economy of Yunnan Province is less developed than that of its eastern and northern neighbours. However, an expanding economy in southern coastal China and Sichuan Province, and a burgeoning local economy have brought about a revival in the use of traditional medicines and in the culinary traditions of this region. Today, Yunnan Province is a major distribution centre for goods, as well as a channel for the importation and export of items to south-east and south-west China. It is considered one of the major routes for the trafficking of Vietnamese wildlife and wildlife products to Guangdong Province and inland provinces, and to Hong Kong. The people of Yunnan Province are among the most ethnically diverse in Asia, comprising 24 registered minority groups, and for many the harvesting and processing of wildlife has long been a major source of income, particularly for those in remote areas.

Methods

During the period June to August 1997, one of the authors (Wang Haibin) visited four cities (the capital Kunming, Gejiu, Kaiyuan and Wenshan) and six counties (Funing, Hekong, Jinping, Maguan, Mengzi, Pinbian) in Yunnan Province, and inspected 42 local free markets for agricultural products, where the sale of species and prices are largely not regulated by the Government, 89 traditional Chinese medicine (TCM) outlets, and 28 restaurants, where the species and the frequency of their appearance over the survey period were recorded. Some 188 wildlife brokers and restaurant patrons were interviewed, as well as tourist guides, taxi drivers, and local wildlife officers. The purpose of the survey was not revealed to those interviewed. The species observed were identified with the aid of the following reference books: Anon., 1994a, Cheng, 1962, 1976, 1989; Dollinger, 1981, 1984, 1985, 1988a, b, c, d; Gao *et al.,* 1987; Hu *et al.,* 1962; Liu, 1959; Sonobe and Usui, 1993; Shou, 1962; and, Vaughan, 1986.

The authors examined the laws and regulations governing wildlife trade and made investigations into the role of the agencies responsible for managing wildlife, and the extent of public awareness and education. The species in trade, the methods and routes used for transportation, the consumption of wildlife in restaurants and in traditional Chinese medicines, as well as market prices and market trends were recorded.

Information relating to wildlife trade, in general, and the effectiveness of wildlife trade control efforts, in particular, was difficult to obtain, in contrast to earlier trade surveys (Li *et al.,* 1996). A telephone survey on the consumption of wildlife in large restaurants and hotels in Kunming met with a poor response: most interviewees refused to answer enquiries, and a few insisted on the presence of the interviewer in the service area. When this was attempted, the interviewer was prevented from taking photographs or inspecting the kitchen without making a purchase and was threatened on a few occasions. Consequently, subsequent survey efforts targeted restaurants and hotels in counties and cities other than Kunming.

TRADE CONTROLS

Legislation

China

China acceded to CITES in 1981. As a Party to CITES, all international trade in CITES-listed species should be accompanied by valid CITES permits or certificates. While there is no specific legislation in force to implement CITES, the *Law of Wild Animals Protection of the People's Republic of China, 1 March 1989* (LWAP) stipulates that an import and export licence is required for trade of wild animals and products regulated by CITES. This law prohibits the hunting, killing, internal trade, import or export of wild animals considered rare and endangered, except in special circumstances. The levels of protection for species are divided into three categories: those afforded "special State protection", "special local protection" and "wildlife which are beneficial or of important economic or scientific value". Wildlife under "special State protection" is listed in Classes I and II: permits for Class II-listed species (trade in which is strictly regulated) are issued by provincial/regional authorities; Class I-listed species (those considered to be threatened with extinction and banned from commercial trade) must be covered by a permit issued by central Government, and are usually issued for research and conservation purposes only. Transportation of wildlife between provinces must also be covered by a permit. All permits must be purchased and registered (Li *et al.,* 1996).

The provincial wildlife authority of Yunnan Province implemented its own regulations on 1 January 1997. These specify the management rules and procedures related to the harvesting, purchasing, processing, transporting and the domestication of wildlife and their products. A special licence is needed to conduct wildlife trade and to serve dishes containing wildlife in restaurants. However, owing to a severe shortage of personnel and financial resources, these regulations are seldom implemented and licences are practically unobtainable.

Protected wildlife species in Yunnan Province are categorized as: a) specially protected species by State (Class I and Class II, under the LWAP); b) specially protected by province (regulating the harvest and trade of species warranting protection and those affected are referred to as Class III species); and, c) species of significant importance to the economy and to scientific research. The latter group of species receive much the same protection as those listed in Class II, but this protection can vary. The first two categories are explicit. However, the third category is not clearly defined, making it possible for the authorities to extend the regulations to cover all wildlife species appearing in markets, and adapting their management policies to the dynamics of local wildlife resources. The list of species affected is communicated to the public in the form of an administrative announcement of the provincial authorities and delivered to the prefecture- and county-level authorities. This can cause complications in management practice and confusion among the general public. For a province with a long history and tradition in harvesting and utilization of wildlife, all species could be said to belong to the third category. Not only does this result in a tremendous loss of revenues to local government because sales are banned, but it causes distrust between government agencies and the indigenous people, whose trade may be forced "underground".

Vietnam

Rare and precious flora and fauna of Vietnam are placed in two groups under *Decree of Council of Ministers No. 18.* of 17 January 1992. Group I consists of species of special scientific or economic value, which are low in number, restricted in distribution or otherwise in danger of extinction. Exploitation and use of such species is strictly forbidden except in special circumstances with the permission of the Chairman of the Council of Ministers. Group II lists those species which are considered to have a high economic value and are threatened by overexploitation. The exploitation of species listed in this category is restricted and requires the permission of the Minister of Forestry.

Vietnam became a Party to CITES in 1994. CITES permit requirements and related trade restrictions were introduced in the Ministry of Agriculture and Rural Development Circular 04 of 5 February 1996 issued under the general trade control *Decree 02/CP* of 5 January 1995.

Sino-Vietnamese Agreement

At the Sino-Vietnamese Working Group on Forestry Co-operation in December 1995, Government Ministers of both China and Vietnam agreed that both countries shall continue to abide by the requirements of CITES and improve conservation of wildlife, especially of endangered species (Anon., 1995).

These principles were further endorsed on 28 April 1998, at a Meeting on the Management of Wildlife Trade Across Sino-Vietnamese Borderline, held between the CITES Management Authorities of China and Vietnam. Mr Meng Sha, Acting Deputy Director General of the CITES Management Authority in China, and Dr Nguyen Ba Thu, Director of the Forest Protection Department in Vietnam, agreed to specific action that will serve as a framework for further co-operation and dialogue with respect to controlling and managing trade in wildlife in the border area. In particular, points endorsed for action include the need to:

> strengthen the ability to monitor illegal wildlife trade activities across the Sino-Vietnamese border and to share information on such activities; adopt active and effective approaches in accordance with each country's

respective laws, in order to prevent and control illegal wildlife trade along the borders and to increase co-operation to this effect; broaden education activities in border areas to increase awareness of the legal status of specific species and the punitive measures associated with their possession, use and trade.

It was agreed that meetings between the relevant authorities of the two countries would be held whenever necessary to keep each other informed of progress and to discuss issues concerning further co-operation (Anon., 1998).

Government wildlife agencies

Officials responsible for wildlife trade controls in Yunnan Province work in the following government sectors:

a) Forestry: this sector includes wildlife protection officials, the forest police force, inspection teams at timber transportation sites, etc. Wildlife officials at provincial, city and county level are responsible for co-ordinating and conducting day-to-day management and conducting regular market inspections. These inspections are irregular and infrequent owing in part to lack of personnel and financial constraints but also, and perhaps more importantly, because of a lack of direction and insufficient knowledge of which activities may be illegal: full-time staff are employed only at the provincial level, with a few full-time and part-time management staff at city or prefecture level, and almost none working in the counties and towns. Although the establishment of inspection posts is in progress, these agencies are unlikely to play important roles in wildlife trade control in the immediate future owing to a lack of resources.

b) Market and business management: officials responsible for controlling wildlife and their products appearing in markets and restaurants. Owing to the lack of training and technical resources, the assistance of the forestry officials is relied upon.

c) Public security and frontier troops: public security agencies play a critical role in uncovering illegal wildlife trade, particularly during the course of their investigations into drug trafficking;

d) Public transportation: large quantities of animals have been discovered by officials during routine inspections of goods travelling by road, rail, and air.

Public awareness and education

Efforts to improve public awareness about wildlife conservation and trade controls have been made via radio and television broadcasts and other news media; information posters have also been placed in public areas. However, these methods do not take into consideration the fact that most harvesters live in rural areas, have had little or poor education and are of mixed ethnic background and therefore often unable to understand *Han Yu* (the official national language, mandarin), or the local Chinese dialect spoken in the capital of each county). Furthermore, such public awareness efforts have not taken into consideration the traditional needs of minorities, nor sought to clarify the legal status of species in trade. Little follow-up to public awareness activities also hinders enforcement.

WWF/H.D. Rijksen

Pig-tailed Macaque *Macaca nemestrina*

TRADE

Species in trade

The species observed in markets, and their protection status, are recorded in Tables 1 and 2. In summary, these consisted of more than 150 vertebrate species representing 23 orders, 53 families and 103 genera. Among them, 26 were listed in Class I and 25 in Class II of the LWAP; 23 species were listed in CITES Appendix I, and 25 in Appendix II. More than 85 species (57%) were either listed as "State specially protected" (including both Class I and Class II) or listed in the CITES Appendices.

Bones claiming to be of Tiger *Panthera tigris* and Leopard *Panthera pardus* were frequently observed in markets, though not in large quantities. A small quantity of products purporting to be Tiger bone or rhino horn were observed on six and four occasions, respectively. However, their authenticity could not be verified because purchasing these items for further examination would have been illegal and, moreover, was considered by the researchers to be unethical. Live primates were seen frequently, usually in small numbers, and included Slow Loris *Nycticebus coucang*, Lesser Slow Loris *N. pygmaeus*, Assam Macaque *Macaca assamensis* and Pig-tailed Macaque *M. nemestrina*. Dried products of Black Gibbon *Hylobates concolor* and Hoolock Gibbon *H. hoolock* were also observed. Pieces of raw ivory, which the traders claimed were from Asian Elephant *Elephas maximus* and African Elephant *Loxodonta africana,* were seen on seven occasions.

Other fauna commonly available in the majority of markets surveyed included Leopard *Panthera pardus* (bones or fur), Clouded Leopard *Neofelis nebulosa* (bones or fur), pangolins *Manis* spp. (live, or dried scales), viverrids (small carnivores, live), falcons (live), accipitrids (hawks, live), tetraonids (grouse, live or frozen), Common Water Monitors *Varanus salvator* (live), as well as live turtles, tortoises, softshell turtles, lizards, snakes and frogs.

Species	Products	Source	Frequency	Protection Status
MAMMALIA				
Northern (European) Hedgehog *Erinaceus europaeus*	live/skin	1,3	++	
Malaysian Treeshrew *Tupaia glis*	live	1	+	II
Slow Loris *Nycticebus coucang*	live/bone		++Hekou, Jinpin, Maguan	1,II
Lesser Slow Loris *Nycticebus pygmaeus*	live	1,4	++	1,II
Assam Macaque *Macaca assamensis*	live/bone	1,3	++Dulong, Jinpin	1,II
Rhesus Macaque *Macaca mulatta*	live/bone	1,3	++Dulong, Jinpin	2,II
Pig-tailed Macaque *Macaca nemestrina*	live/bone	1,3	++Dulong, Jinpin	1,II
Stump-tailed Macaque *Macaca arctoides*	live, bone	1,3	++Dulong, Jinpin	2,II
Black Gibbon *Hylobates concolor*	live/bone/claw	1	+Jinpin	1,I
Hoolock Gibbon *H. hoolock*	live/bone/claw	1	+Jinpin	1,I
Asian Elephant *Elephas maximus*/ African Elephant *Loxodonta africana*	skin/bone/ivory	1,unconfirmed	+++Kunming, Mengzi, Hekou, Dulong	1,I
Pangolins *Manis*	live/scale/stuffed	1,4	+++Qiatotou, Kunming, Jinpin, Kaiyuan, Nafa, Hekou	2,II
Lesser Panda *Ailurus fulgens*	skin (fur)	1,3	+	2,I
Asiatic Black Bear *Ursus thibetanus*	gallbladder/medicine	1,2 3,4	+++	2,I
Brown Bear *Ursus arctos*	gallbladder/medicine	1,2,3,4	+++	2,I/II
Siberian Weasel *Mustela sibirica*	skin/liquor	1	++	III
Mountain Weasel *Mustela altaica*	skin/dried corpse	1	++	III
Steppe Polecat *Mustela eversmanni*	skin/dried corpse	1	++	
Stripe-backed Weasel *Mustela strigidorsa*	skin/dried corpse	1	++	
Chinese Ferret Badger *Melogale moschata*	medicine/pelt/meat	1	++	
Common Otter *Lutra lutra*	skin/claw/liver/bone/dried corpse	1,4	+++	I
Yellow-throated Marten *Martes flavigula*	skin/claw/skull/bone	1	++,	III
Large Indian Civet *Viverra zibetha*	skin/meat	1	+++Wenshan	2,III
Small Indian Civet *Viverricula indica*	skin/meat	1	+Wenshan	2,III
Spotted Linsang *Prionodon pardicolor*	pelt/meat	1	+	2,I
Masked Palm Civet *Paguma larvata*	live/meat	1, Myanmar(?)	+++Maguan,Mapiaopo, Wenshan	III
Crab-eating Mongoose *Herpestes urva*	pelt/meat	1	+++	III
Tiger *Panthera tigris*	bone/medicine/liquor	1,4, Myanmar,Thailand	+++Jinpin, Hekou, Magua, Wenshan, Mapiaopo	1,I
Leopard *Panthera pardus*	bone/medicine/liquor	1,3	+++	1,I
Clouded Leopard *Neofelis nebulosa*	bone/medicine/liquor	1,3	+++	1,I
Asiatic Golden Cat *Catopuma temminckii*	skin/bone/liquor	1	++	2,I
Marbled Cat *Pardofelis marmorata*	skin/bone/liquor	1	++	I
Leopard Cat *Prionailurus bengalensis*	skin/bone/liquor	1	++	I
Fishing Cat *Felis viverrina*	skin/bone/liquor	1	++	2,II
Common Seal *Phoca vitulina*	dried genitals	3	+++	2
Rhinoceros	horn/medicine	SE Asia, Africa(?)	++Hekou	I
Siberian Musk Deer *Moschus moschiferus*	musk/medicine			
Dwarf Musk Deer *Moschus berezovskii*	musk/medicine			
Himalayan Musk Deer *Moschus chrysogaster*	musk/medicine	1,2,3	+++2	I/II
Red Deer *Cervus elaphus*	velvet/foetus/blood/tail, ligament/genital/hoof/antler	1,2,3	+++	2
Sambar *Cervuc unicolor*	"	1,2,3	+++	2
Sika Deer *Cervus nippon*	"	1,2,3	+++	1
Brow-antlered Deer *Cervus eldii*	"	1,2,3	+++	1,I
Indian Muntjac *Muntiacus muntjak*	meat/antler	1	+++Kunming, Jinpin, Dulong	
Chinese Muntjac *M. reevesi*	meat/antler	1	+++Kunming, Jinpin, Dulong	
Roe Deer *Capreolus capreolus*	antler	3	+	
Wild Pig *Sus scrofa*	meat	1	+++	
Gaur *Bos gaurus*	horn/skull	1, Myanmar	+Kunming	1,I
Przewalksi's Gazelle *Procapra przewalskii*	horn/skull	2,3	+	1
Tibetan Gazelle *Procapra picticaudata*	horn/skull	2,3	+Kunming	2
Ibex *Capra ibex*	horn/skull	3	+Kunming	1
Blue Sheep *Pseudois nayaur*	horn/skull	2	+Kunming	2
Argali *Ovis ammon*	horn/skull	3	+Kunming	2,I
Goral *Naemorhedus goral*	horn/skull/blood	3	++Kunming, Dulong	2,I
Serow *Naemorhedus sumatraensis*	horn,/skull	1	+Kunming, Jinpin, Dulong	2,I
Saiga Antelope *Saiga tatarica*	horn	Russia	+++	1,II
Chinese Hare *Lepus sinensis*	live/meat	1	+++	
Plain long-nosed squirrels *Dremomys* spp.	live	1	++	
Squirrels *Tamiops* spp.	live	1	++	
Giant flying squirrels *Petaurista* spp.	bone/dried corpse	1,3	++Kaiyuan, Dulong	
Chinese Bamboo Rat *Rhizomys sinensis*	live/meat	1	+++	
Hoary Bamboo Rat *Rhizomys pruinosus*	live/meat	1	+++	
Hystricoidea Porcupines				+++
Chinese Porcupine *Hystrix hodgsoni*	live/meat/quill	1	++	

Species	Products	Source	Frequency	Protection Status
AVES				
Mandarin Duck *Aix galericulata*	live	1	+++	2
Ducks *Anas* spp.	live	1	+++	2
Black Kite *Milvus migrans*	feather/live	1	++	2,II
Hawks *Accipiter* spp.	feather	1	++	2
Eurasian Sparrowhawk *Accipiter nisus*	live/feather	1	++	2,II
Eagles *Aquila* spp.	feather/meat/claw	1	++	1
Falcons *Falco* spp.	feather/claw	1	++	2
African Grass-Owl *Tyto capensis*	feather/live	1	++	2,II
Long-eared Owl *Asio otus*	feather/live	1	++	2,II
Eurasian Eagle-Owl *Bubo bubo*	feather/live	1	++	2,II
Crimson Sunbird *Aethopyga siparaja*	live	1	++	II
Common Pheasant *Phasianus colchicus*	live	1	+++	
Temminck's Tragopan *Tragopan temminckii*	live	1	+++	2
Silver Pheasant *Lophura nycthemera*	live	1	+++	2
Hume's Pheasant *Syrmaticus humiae*	live	1	+++	1,I
Elliot's Pheasant *Syrmaticus ellioti*	live	1	+++	1,I
Golden Pheasant *Chrysolophus pictus*	live	1	+++	2
Lady Amherst's Pheasant *Chrysolophus amherstiae*	live	1	+++	2
Grey Peacock-Pheasant *Polyplectron bicalcaratum*	feather/live	1	+++	1,II
Green Peafowl *Pavo muticus*	feather	1,4, Myanmar	+++Kunming	1,II
Partridge *Arborophila* spp.	live			
Allaudidae	live	1	++	
Oriolus spp.	live	1	++	
Black-billed Magpie *Pica pica*	live	1	++	
Hill Myna *Gracula religiosa*	live	1	+++	
Masked Laughingthrush *Garrulax perspicillatus*	live	1	++	
White-throated Laughingthrush *Garrulax albogularis*	live	1	++	
Black-throated Laughingthrush *Garrulax chinensis*	live	1	+++	
Hwamei *Garrulax canorus*	live	1,3	++	
White-browed Laughingthrush *Garrulax sannio*	live	1	++	
Silver-eared Mesia *Leiothrix argentauris*	live	1	++	
Red-billed Leiothrix *Leiothrix lutea*	live	1	++	
Parus spp.	live	Imported or captive	+++	
Pinicola spp.	live	Imported or captive	+++	
Oriental Turtle-Dove *Streptopelia orientalis*	live	1	+++	
Spotted Dove *Streptopelia chinensis*	live	1	+++	
Rose-ringed Parakeet *Psittacula krameri*	live	captive	+++	2
Derbyan Parakeet *P. derbiana*	live	captive	+++	2,II
Plum-headed Parakeet *P. cyanocephala*	live	unknown		2,II
REPTILIA				
Black-breasted Leaf Turtle *Geoemyda spengleri*	live	1,4	+++	2
Chinese Three-striped Box Turtle *Cuora trifasciata*	live	1,4	+++	2
Yunnan Box Turtle *Cuora yunnanensis*	live	1,4	+	2
Platysternon megacephalum	live	1,4	+++	
Chinese Broad-headed Pond Turtle *Chinemys megalocephala*	live	1,4	+++	
Chinese Three-keeled Pond Turtle *Chinemys reevesii*	live	1,4	+++	
Mauremys mutica	live	1,4	+++	
Sacalia bealei	live	1,4	+++	
Crowned River Turtle *Hardella thurjii*	live	4(?)	++	
Horsfield's Tortoise *Testudo horsfieldii*	live	1,4	+++	1,II
Elongated Tortoise *Indotestudo elongata*	live	1,4	+++	1,II
Impressed Tortoises *Manouria impressa*	live	1,4	+++	1,II
Hawksbill Turtle *Eretmochelys imbricata*	shell	3 (?)SE Asia	+++	2,I
Asian Giant Softshell Turtle *Pelochelys bibroni*	live	1,4	+++	1
Wattle-necked Softshell Turtle *Palea steindachneri*	live	1,3	+++	2
Chinese Softshell Turtle *Pelodiscus sinensis*	live	1,3	+++	
Water Monitor *Varanus salvator*	live/meat/skin	1,4	+++Mengzi, Nafa, Hekou, Wenshan	1,II
Tokay *Gekko gecko*	live/dried	1,3,4	+++	2
Geckos *Gekko* spp.	live/dried	1,3,4	+++	
Hemidactylus spp.	live/dried			
Oriental Long-tailed Lizard *Takydromus sexlineatus*	live	1	++	
Ophisaurus harti	live/dried/liquor	1	+++	
Chinese Crocodile Lizard *Shinisaurus crocodilurus*	live/dried	3	+	1,II
Burmese Python *Python molurus*	live/dried/liquor	1,4	++	1,II
Elaphe moellendorffi	live/liquor	1,4	+++	
Copperhead Trinket Snake *Elaphe radiata*	live/liquor	1,4	+++	
Amphiesma stolata	live/liquor	1,4	+++	
Common Rat Snake *Ptyas mucosus*	live/dried/liquor	1,4	+++	II
Ptyas korros	live/dried/liquor	1,4	+++	
Cantor's Rat Snake *Zaocys dhumnades*	live/dried/liquor	1,4	+++	
Macropisthodon rudis	live/dried/liquor	1,4	+++	
Asian Cobra *Naja naja*	live/liquor	1,4	+++	II

Photographs from top: Black Kite *Milvus migrans* (WWF/Henry Ausloos); Silver Pheasant *Lophura nycthemera* (WWF/Gerald Cubitt); Northern Goshawk *Accipiter gentilis* (WWF/Fred Hazelhoff); Eurasian Eagle-Owl *Bubo bubo* (WWF-Canon/Jan Habrovsky)

Species	Products	Source	Frequency	Protection Status
King Cobra *Ophiophagus hannah*	live/liquor	1, 4	+++	II
Banded Krait *Bungarus fasciatus*	live/liquor	1, 4	+++	II
Many-banded Krait *Bungarus multicinctus*	live/liquor	1, 4	+++	
Deinagkistrodon acutus	live/liquor	1, 4	+++	
Trimeresurus stejnegeri	live/liquor	1, 4	+++	
Brown Spotted Pit Viper *T. mucrosquamatus*	live/liquor	1, 4	+++	
Russell's Viper *Vipera russelli*	live/liquor	1, 4	+++	
Agkistrodon acutus	live/liquor	1, 4	+++	
AMPHIBIA				
Chinese Giant Salamander *Andrias davidianus*	live	3	++	2,I
Echinotriton asperrimus	live/liquor/dried	1	+++	2
Tylototriton spp.	live	1	+++	2
Rana cateseiana	live	1	+++	
Tiger Frog *Rana tigerina*	live	1	+++	2,II
Boulenger's Toad *Rana boulengeri*	live	1	+++	
Rana spp.	live	1	+++	
Toads *Bufo* spp.	live	1	+++	

Table 1. Wildlife species observed in trade along Yunnan-Vietnam border, including selected species of economic or medicinal value and the specific locations of their sale, June to August 1997.

*Genus and family names only, refer to specimens that could not be identified to species level owing either to poor field conditions or to limited taxonomic knowledge of the investigator; "*Bufo *spp." and the like, do not indicate all the species of a genus, or the family.*
Source: 1 = Yunnan, 2 = Tibet, 3 = other provinces or autonomous regions, 4 = Vietnam, ? = probably.
Frequency of observations: + = once, ++ = two to five times, +++ = more than five times. Legal status: 1 = WPL Class I (fully protected); 2 = WPL Class II (trade requires permits); I = CITES Appendix I listing; II = CITES Appendix II listing.

Based on field observations and interviews with local brokers and retailers, the main methods used to transport and conceal illicit wildlife trade are:

1) public transport: the rapid development of long-distance bus services has made it easier for wildlife traffickers to avoid routine inspection. They often collaborate with bus drivers to find hiding places on vehicles only accessible to drivers (e.g., tool cabinets). In July 1999, authorities in Yunnan Province seized hundreds of animal parts from packages that were awaiting dispatch by mail so as to avoid border controls (Anon., 1999);

2) the use of false licences to avoid inspection, or the purchase of a "pass" from corrupt inspection officers;

3) the concealment of wildlife/products with other goods. Typical methods include hiding live animals with livestock, fish, snakes and frogs, which also helps to mask any wild animal odours;

4) private vehicles: a recent development that allows items to be easily concealed and is of relatively low cost.

The authors observed a significant decrease in the number of animals transported over long distances compared to the previous survey (Li *et al*., 1996). This might be a consequence of less availability and higher market values of wildlife and their products and a decline in constant market demands in a single area, or of stricter market controls, although this last possibility is unlikely in the light of the survey findings. In addition, transporting wildlife in small quantities reduces the risk of financial loss and prosecution if discovered.

Transportation routes

It has long been suspected that major trade routes for wildlife trafficking exist in this area. However, the survey found that these routes either no longer exist or are very hard to detect. It was only possible to establish that wildlife is transported to inland provinces via Sichuan, or towards Guangdong Province, and Hong Kong, via Guangxi Autonomous Region. This might be a consequence of the rapid development of the local road network in the early 1990s and strengthened controls on wildlife trafficking along the major cross-State routes between Yunnan, Guangxi, Guizou and Sichuan.

Transactions of goods

Two categories of transactions were discovered during interviews which, again, indicate a change to methods used previously (Li *et al.,* 1996).

***Direct transactions*:** generally occur in open markets in cities or county capitals where agricultural products, flowers and birds are sold, or at regular market gatherings in small towns by local farmers who capture and sell wildlife to subsidize their income. Trade occurs at irregular times and sites and consists of a small volume of a diverse range of species such as turtles, snakes, frogs and large birds, and medicinal materials such as animal bones, blood, skin, and dried carcasses. Most of the species are not legally protected. Sellers either display their goods in the markets or display cages used to transport wildlife, hunting tools and wildlife

^ **Gaur *Bos gaurus***

Photo: WWF/Mandal Ranjit

< Goral
Naemorhedus goral

Photo: WWF/Gerald Cubitt

specimens to attract potential customers, the actual transactions being made elsewhere. This suggests that the function of the open market has changed to being one where potential trade is first negotiated rather than being the actual site of the transaction.

***Underground transactions*:** according to the authors' findings, underground transactions take place between wildlife brokers and their regular patrons, who are mainly owners of restaurants or Chinese traditional medicine shops/clinics. They have a stable supply-and-purchase partnership, and maintain regular underground transaction networks. Parties involved are required to maintain trust, pay deposits, or introduce regular patrons or "insiders". It was found that restaurant owners generally have good connections with local officials or regular wealthy customers, which enables them to avoid inspections. They were found to serve meals containing wildlife ingredients at business social events.

Restaurant consumption

Restaurants or hotels serving wildlife meals can be grouped into two categories:

***Standard restaurants*:** located in small or medium-sized towns in remote locations. Dishes occasionally include ingredients derived from protected species, but more often will consist of non-protected snakes, turtles, tortoises, softshell turtles, frogs, wild hares etc. Two services are offered: the provision of a meal, or the preparation of ingredients provided by the patron.

***Special restaurants or hotels*:** located in medium-sized towns, especially those in which local government agencies and large corporations are based. These restaurant/hotels were found to be either owned by these agencies or corporations, or employees were regular patrons. According to local patrons and wildlife brokers, these establishments often serve expensive dishes with ingredients from protected species. However, as a rule, meals containing such ingredients do not appear on the menu. Only regular patrons are served, or those who have been introduced by a regular patron or an "insider", and are generally the heads of corporations, or government officials conducting business, socializing or on routine inspections.

During the survey, vehicles with government number plates were often seen in restaurant car parks during meal times; one restaurant in Maguan County was observed to be selling meals consisting of pangolins and water monitors to local officials. This restaurant is believed to serve endangered species on occasion. Further, some brokers indicated that order-and-delivery services for ingredients derived from endangered wildlife were available, and indicated that time was needed to organize such a service.

Chinese traditional medicine or medicinal materials

Wildlife-related Chinese traditional medicine and medicinal materials seen most often during the period of this survey included:

1) liquor with snakes as ingredients, either whole snake or bits;

2) liquor with Tiger *Panthera tigris* bone or Leopard *P. pardus* bone listed in the ingredients;

3) musk and "Tiger" bone plaster (although Leopard bones are reported to have replaced Tiger bones owing to the unavailability of Tiger bone in the manufacture of such products).

4) raw materials identified as seal penis, deer penis, dried deer blood, deer foetus, elephant skin, monkey bone, gibbon bone, bear gallbladder, antelope horns, and items labelled as Tiger bone and rhino horn.

Products	Unit	RMB Yuan[1]	US Dollar[2]
Tiger *Panthera tigris* bone	10 g	200	24.25
Tiger bone liquor	750 ml	85	10.30
Leopard *Panthera pardus* bone	kg	810	98.20
Rhino horn	10 g	95	11.50
Antelope horn	pair	50	6.10
	each	80-90	9.70–10.90
Gaur *Bos gaurus*, skull and horn	pair	1250	151.50
Elephant skin *Elephas maximus/Loxodonta africana*	kg	104	12.60
Pangolin *Manis*, live	kg	160	19.40
Civet, live	each	100	12.10
Gibbon *Hylobates,* bone	pair	20	2.40
Otter *Lutra,* live	each	96	11.65
Chinese Bamboo Rat *Rhizomys sinensis*, live	each	50	6.10
Golden Cat *Catopuma temminckii* (live)	each	50	6.10
Leopard Cat *Prionailurus bengalensis*, live	each	20	2.40
Chinese Hare *Lepus sinensis*, live	each	40	4.85
Muntjak *Muntiacus*, antler	pair	60	7.30
Muntjak *Muntiacus*, dried meat	kg	100	12.10
Golden turtles (likely to be: Chinese Three-Striped Box Turtle *Cuora trifasciata* or Yellow-margined Box Turtle *Cuora flavomarginata* or Yellow Pond Turtle *Mauremys mutica*)	each	300	36.40
Water Monitor *Varanus salvator*, soup	per serving	800	97.0
Water Monitor *Varanus salvator*, live	kg	120	14.55
Wild pheasant, live	each	40	4.85
Turtle, tortoise, live	kg	160-200	19.40 – 24.25
King Cobra *Ophiophagus hannah*, live	kg	300	36.40
Asian Cobra *Naja naja*, live	kg	160	19.40
Poisonous snake, live	kg	30-100	3.65–12.10
Non-poisonous snake, live	kg	10-50	1.20–6.10

Table 2 Market prices of selected wildlife items on sale along the Yunnan-Vietnam border, June-August 1997.
Note: where part of animal not specified, the live animal was seen for sale
[1]*Market price for pork in the same period is 10 RMB Yuan/kg (USD1.25/kg).* [2]*USD1 = 8.25 RMB Yuan.*

Market Prices

Market prices varied greatly from market to market, and according to availability and the bargaining skills of patrons. Items labelled as Tiger bone fetched USD24 per 10 g and a bottle of Tiger bone liquor was available for USD10; rhino horn was USD98 per 10 g. Other examples include live pangolins (USD19/kg), live civets (USD12 each), live King Cobras *Ophiophagus hannah* (USD36/kg), and live Asian Cobras *Naja naja* (USD19/kg) (Table 2).

Trends of Wildlife Markets

As indicated above, several significant changes in market demands and transactions were observed, in particular, the replacement of large specialized traditional open markets with scattered, small, local markets, and the evidence of underground wildlife trade networks. The following factors may have contributed to such change: 1) stricter wildlife laws and regulations and market control; 2) exhaustion of supplies of some species; and, 3) an increase in local consumption as a result of the rapid development of the local economy and transportation networks.

Market demands for wildlife with medicinal or aesthetic value, as pets, or for use in indoor decoration have increased rapidly. For example, birds, turtles, snakes, salamanders, and small mammals, skulls and horns of Gaur *Bos gaurus,* Blue Sheep *Pseudois nayaur* and Argali *Ovis ammon*, deer antlers, snakeskins, furs of large mammals (cats, deer), and colourful feathers were frequently seen in the market. According to the brokers and patrons interviewed, such goods were much less commonly seen and requested in the past.

With the improvement in transportation and communication beyond Yunnan Province's borders, many species that were not traditionally utilized are now harvested and entering the market. They are often used as an alternative to items that are now out of stock, for example, Leopard bones and bones from medium-sized cats may be used instead of Tiger bones. Also, more species from northern China and from Tibet, or their derivatives, have started to appear in local markets. For example, roe deer *Capreolus capreolus* antlers, and antelope (including *Procapra picticaudata* and *P. prezewalskii*) antlers and bear gallbladders that brokers frequently claimed were from the northern provinces of Helongjiang, or Jilin.

Finally, the sources of goods tend to be more scattered, and the distance between these sources and the point of retail have become greater.

Conclusions and Recommendations

The survey findings suggest that deficiencies in wildlife trade management in this region persist in several ways. The trade in protected species is still widespread. Technical and human resources for the control of trade are in short supply, and the implementation of wildlife laws and regulations appear to be lacking. The authors found that there is insufficient awareness by officials of their role in the control of illegal wildlife trade and consumption, most of them apparently considering such activities as being "minor" problems in private life rather than a violation of law. Finally, public awareness and education materials do not target the full range of ethnic populations of the region.

To improve wildlife trade controls, it is recommended that wildlife authorities take the following action:

1) evaluate the effectiveness of wildlife laws and regulations and ensure their compatibility with available personnel and technical resources, and their implementation at county- and town-level;

2) increase personnel and technical resources at county- and town-level and improve the professional training of wildlife officers and those responsible for public security, border inspection, market management and transportation;

3) review prosecutions and sentencing to assess the level of enforcement, and increase penalties (currently consisting of fines and a short gaol-term) to make them a greater deterrent; consider offering incentives to law enforcement officials to step up control of illegal trade;

4) develop public awareness and education materials for the multi-ethnic population of Yunnan Province.

In addition, international conservation organizations and local non-governmental organizations should be encouraged to provide technical assistance, and to make efforts that will assist the wildlife authorities in Yunnan Province in improving trade controls. These include the need to:

1) continue to monitor the dynamics of wildlife trade in this region;

2) minimize and eventually eliminate the distrust between conservation organizations and local government agencies by way of initiating closer co-operation and more frequent communication between them. Share the findings of investigations and field research before publication to allow up-to-date information to be put into practice, and to avoid any political embarrassment to local authorities;

WWF-Cannon/Fred Hazelhoff

Roe Deer *Capreolus capreolus*

3) urge local wildlife authorities to develop public awareness materials for the ethnic communities in the region and seek the co-operation of Yunnan Province's academic institutions to improve understanding of the culture of ethnic minorities. Assistance should be offered in these areas;

4) encourage the funding of research into the socio-economic aspects relating to wildlife trade if there is to be any change to wildlife management in China. Efforts by non-governmental organizations and international conservation organizations should bring in technical resources and experience in this field, and motivate Chinese wildlife authorities and relevant research institutions.

5) facilitate co-operative dialogue and cross-border operations between Yunnan Province and Vietnam.

Acknowledgements

This survey was sponsored by Wildlife Conservation Society, New York. The authors thank Dr Todd K. Fuller for his advice on study design and editorial assistance, and the following for their enthusiastic assistance: Zhang Yi-Fan (Department of Biology, Yunnan Education College), Yu Ji-Yun (Department of Sociology, Yunnan University), Wang Yu (Department of Biology, Yunnan University), Wang Ying-Xiang and Liu Wan-Zhao (Kunming Institute of Zoology, Chinese Academy of Sciences). The authors also wish to thank the anonymous reviewers for their valuable and constructive comments.

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The sources of information upon which the cases below are based are cited at the end of each country section. CITES Appendix listings appear in parentheses.

EUROPE

BELGIUM

On 8 May 1999, Customs officers seized 450 live tortoises at Orly Airport, Paris, which had arrived from Madagascar. The animals had been smuggled by three Malagasy citizens living in Paris. The shipment consisted of 120 Radiated Tortoises *Geochelone radiata* (App. I) and 330 Spider Tortoises *Pyxis arachnoides* (App. II). The specimens have been transferred to a breeding centre in Corsica. The suspects were not arrested.

Among wildlife specimens seized by Customs officers at Zaventem Airport between January and April 1999 were the following: skins of 12 African Pythons *Python sebae* (EU Annex B/App. II) (see box for explanation of EU listings) in transit from Nigeria to Italy (postal package with no CITES documents); 2 pairs of shoes made from Python *Python* spp. (EU Annex B/App. II) skin, in transit from Nigeria to the Netherlands (postal package with no CITES documents); 49 geckos *Phelsuma leiogaster* (EU Annex B/App. II) from Belgium to Madagascar (air cargo with no CITES documents); 30 belts and 51 handbags of skins of crocodiles *Crocodylus* spp., monitor lizards *Varanus* spp. and pythons *Python* spp. from Senegal to Belgium (CITES documentation did not correspond to the shipment).

Info Tortues, Association Cupulatta, Vignola, Corsica; TRAFFIC Europe

GERMANY

During 1998, a total of 425 kg of caviar arriving by freight was seized in 12 separate incidents at Frankfurt/Main International Airport. The largest single consignment, from Israel, weighed 251 kg. The principal countries of origin for the remaining shipments were Russia, Kazakhstan and Azerbaijan. Fifty seizures of caviar, totalling 108 kg, took place in the airport's passenger section during the same period.

Frankfurt Airport Customs Authority; TRAFFIC Europe

UK

Cambridgeshire Police and the Royal Society for the Protection of Birds (RSPB) have been involved in the first conviction for the new offence of 'purchasing an EU Annex A specimen' (under the *Control of Trade in Endangered Species (Enforcement) Regulations 1997* (*COTES 1997)*. The purchase was the exchange of a Northern Goshawk *Accipiter gentilis* for a Saker Falcon *Falco cherrug* (both App. II and also listed in EU Annex A which provides a higher level of protection). During a search at an address in Peterborough in July 1998, a cable-tied wild male Goshawk was seized. The keeper of the bird, Gerald Frederick Chester, was serving a five year ban on the keeping of Schedule 4 birds following his 1997 conviction for an offence under Section 8(1) of the *Wildlife and Countryside Act 1981*.

On 5 October 1998, at Peterborough Magistrates' Court, Chester pleaded guilty to one charge of making a false declaration to obtain a registration of a Schedule 4 bird contrary to Section 17(1) of the *Wildlife and Countryside Act 1981*, and one charge of purchasing an Annex A bird contrary to Regulation 8(1) of *COTES*. Chester received a two-year conditional discharge and was ordered to pay GBP69 (USD110) costs.

Between October 1998 and June 1999 a number of seizures of caviar have occurred at Heathrow Airport, the largest being 350 kg, with the others weighing 35 kg, 35 kg, 36 kg, 2.5 kg, 40 kg and 25 kg. Passengers were travelling from Iran, Turkey and Dubai when they were stopped.

Between 19 November 1998 and 17 March 1999, Felixstowe Customs and Excise authorities seized commercial imports of traditional Chinese medicines from China, amongst which were the following ingredients:

76 080 pills (Costus Root *Saussurea costus*, App. I, and Musk Deer *Moschus* App. I/II); 492 aerosols (Musk Deer, App I/II, and seahorse, EU Annex D); 8000 pills (seahorse, EU Annex D); 131 kg/300 pills (orchid *Gastrodia elata*, App. II); 53.5 kg (Bletilla *Bletilla* orchid, App. II); 800 capsules (Cantor's Rat Snake *Zaocys dhumnades,* EU Annex D).

The cases involved three companies, one of which was fined for two separate incidents and given a warning. Action in the case of the other two companies was limited to seizure.

Between December 1998 and May 1999, Customs officers at Heathrow Airport seized the following (the country of dispatch appears in parentheses):

December 1998: 15 Horsfield's Tortoises *Testudo horsfieldii* (App. II) (Uzbekistan). The consignment exceeded the permit limit.
January 1999: 100 Tiger *Panthera tigris* (App. I) bone plasters (Hong Kong) destined for a food shop. Police and Customs investigations are under way.
February: 6 Mona Monkeys *Cercopithecus mona* and Lesser Spot-nosed Guenons *C. petaurista* (both App. II) (Ghana). Too young to travel and therefore contravened IATA regulations.
April: 168 sea turtle eggs (Brunei) failed to be collected. All sea turtles are listed in App. I and prohibited from commercial trade.

Annexes of the EU wildlife trade regulation

Annex A: for species listed in this Annex commercial trade from, to and within the EU is generally prohibited. External trade is governed by provisions comparable to those applicable to CITES Appendix I species. Includes all CITES Appendix I species as well as any species that is or may be in EU or international demand that is threatened with extinction or is so rare that any trade would imperil its survival.

Annex B: trade in specimens to and from the EU requires the issuance of import/export permits and re-export certificates in accordance with the provisions applicable to CITES Appendix II species. There are significant differences, however: unlike CITES Appendix II, import permits are required for imports of Annex B species and imports can be restricted in spite of the fact that the (re-)exporting country has issued a valid CITES permit/certificate. Contains remaining CITES Appendix II species, look-alike species to be listed for effective control of trade, and species known to pose an ecological threat to indigenous species.

WWF/John Mitchell

Northern Goshawk *Accipiter gentilis*, listed in CITES Appendix II and in EU Annex A.

Annex C: contains the CITES Appendix III species that are not listed in Annex B. Species are not subject to the stricter EU requirement of an import permit and trade can take place on the basis of the CITES (re-)export document and an import notification.

Annex D: non-CITES species that are not listed in Annexes A to C and that are imported into the Community in such numbers as to warrant monitoring. Also includes Appendix III species with a reservation. Imports require an import notification.

TRAFFIC Europe reference guide on European Community Wildlife Trade Regulations. Full details of Annexes can be found in the Official Journal of the European Communities L 325, Vol. 40, 27 November 1997.

2 Black-necked Swans *Cygnus melanocorypha* (App. II) (USA) in transit to Nigeria. Without CITES permits.
May: 100 Spectacled Caimans *Caiman crocodilus* (App. I/II), and the following Appendix II-listed specimens: 15 Dwarf Caimans *Palaeosuchus palpebrosus*, 18 Red-footed Tortoises *Geochelone carbonaria*, 2 Emerald Tree Boas *Corallus caninus*, 25 Cook's Tree Boas *C.enydris*, 11 Boa Constrictors *Boa constrictor*, 3 Anacondas *Eunectes murinus*, and including 3 Matamata Turtles *Chelus fimbriatus* and 757 tarantulas (not controlled) (Guyana). Export and import permits had expired.

On 28 January 1999, at Inverness Sheriff Court, Scotland, Wilhelmus Hubertus Josephus Enzlin, from Eindhoven, Netherlands, was charged with violating the *Control of Trade in Endangered Species (Enforcement) Regulations 1997 (COTES 1997)* after offering to purchase 16 Peregrine Falcons *Falco peregrinus* (App. I) chicks. The case arose after Enzlin wrote a series of letters to Peregrine breeders in the UK requesting wild Peregrine chicks. One recipient, a Scottish falconer, informed the RSPB. Taking advice from the police, a representative of the RSPB arranged to meet with Enzlin under the pretext of offering Peregrine chicks for sale. On 24 May 1998 Enzlin and two others were arrested as they met the fictional Peregrine supplier and a Special Constable in the guise of a local gamekeeper. Enzlin had GBP4000 (USD6360) in his possession, and this, along with two cars being used, were seized. He pleaded guilty and was fined GBP2000 (USD3200) and was ordered to forfeit his car and the GBP4000, despite a plea by the other two defendants that the money was theirs and should therefore not be forfeited.

This case is the first successful implementation of *COTES 97* in Scotland.

In April 1999, Customs officers at Falmouth discovered a four-month-old female Green Monkey *Chlorocebus aethiops* (App. II) in a taped-up cardboard box in the ship's air conditioning system. The owner, a Portuguese national, was arrested and fined GBP500 (USD795). The primate was seized and will spend six months in quarantine before being transferred to a permanent home in a British zoo.

In May 1999, at Northallerton Magistrates' Court, Harry Sissen, of Northallerton, was charged on three counts of illegally importing three Lear's Macaws *Anodorhynchus leari* (App. I) from an unknown source contrary to the *Customs and Excise Management Act* (CEMA) 1979. He was further charged with illegally importing 6 Blue-headed Macaws *Ara couloni* (App. II), contrary to CEMA, and of selling a Palm Cockatoo *Probosciger aterrimus* and a Hyacinth Macaw *Anodorhynchus hyacinthinus* (both App. I) contrary to the *Control of Trade in Endangered Species (Enforcement) Regulations 1985* (*COTES 1985)*. Sissen pleaded not guilty to all charges.

The incident came to light following a raid on an address in North Yorkshire in April 1998 (*TRAFFIC Bulletin* 17(2):88). The case has been adjourned until further notice.

RSPB/G. Shorrock

A total of 140 Lear's Macaws *Anodorhynchus leari* (App. I) (above), were estimated to survive in the wild in 1994, confined to approximately 4000 km^2 in north-east Brazil. The species may always have been rare, and trapping for trade is an ever-present danger.

On 18 May 1999, at Manchester Airport, the CITES enforcement team seized a shipment of 200 Horsfield's Tortoises *Testudo horsfieldii* (App. II) from a flight arriving from Frankfurt, Germany, bound for a pet wholesaler in Manchester. The trader had contravened the export licence laws. The 12-cm long specimens - of one of the smallest breeds of tortoise - had originated in the grasslands of Tadzhikistan, near the China-Afghanistan border, and had been dispatched from the Ukraine. They had been wedged into packing pallets and were dehydrated and undernourished; one specimen died. The remaining tortoises have been placed with British zoos, wildlife parks and specialist conservation groups.

H.M. Customs and Excise, Felixstowe; CITES Enforcement Team, Heathrow; Portcullis, July 1999; *The Royal Society for the Protection of Birds*

AFRICA

KENYA

On 4 September 1998, a shipment of 200 African Grey Parrots *Psittacus erithacus* (App. II) was seized at Jomo Kenyatta International Airport, Nairobi. The consignment had been exported from Cameroon and was travelling via Nairobi, to South Africa. The accompanying permits were not the original documents and contained falsified entries. Upon seizure, the parrots were transported to the offices of the Kenya Society for the Protection and Care of Animals. Of the original 200 birds, just over 100 remain in the care of the KSPCA, the others having died from disease. The Kenya Wildlife Service has been in contact with the authorities in Cameroon, and a decision over the fate of the birds is yet to be decided.

TRAFFIC East/Southern Africa

SOUTH AFRICA

On 1 February 1999, at Bethlehem Magistrates' Court, Free State Province, Jacobus du Plessis, of Welkom, was charged with illegally trading in rhino horns. The case arose following an attempt by du Plessis to sell two rhino horns to officers from Free State Nature Conservation and from the KwaZulu-Natal Nature Conservation Service. Du Plessis was sentenced to a fine of R40 000 (USD6390) or two years' imprisonment, with a further two years' imprisonment suspended for two years. The sentence is the highest ever for a nature conservation-related offence in the Free State.

On 12 February 1999, at Thabazimbi Magistrates' Court, Northern Province, three men aged from 22 to 26 years of age were each sentenced to 29 years' gaol following charges of rhino poaching, housebreaking and theft; one of the four rhinos poached was heavily pregnant. The poaching is reported to have taken place in December 1997 on a farm in Thabazimbi and reported to the Endangered Species Protection Unit by the owner of the farm. The suspects were also accused of housebreaking and theft during this period, including theft of the weapons used to kill the rhinos.

On 19 February 1999, at Paarl Magistrates' Court, Samuel Le Roux, of Johannesburg, was sentenced to a 12-month prison term or a fine of R12 000, suspended for five years. The previous day, police recovered 1113 (400 kg) perlemoen (abalone) *Haliotis* spp. after stopping Le Roux's car and trailer near Paarl, Western Cape. He had been under observation by the police, and is believed to be a member of a perlemoen poaching syndicate. It is compulsory for individuals to purchase permits to harvest perlemoen in South African waters, which Le Roux had not done, and, moreover, perlemoen harvesting is strictly regulated by a quota system.

On 26 July 1999, five men were apprehended after being caught in possession of a number of Arum Lilies *Zantedeschia aethiopica* that they had illegally collected from a property owned by the Helderberg municipality, in Western Cape Province. The incident was investigated by Cape Nature Conservation district service officers after the vehicle in which the men were travelling was stopped by law enforcement officers in Macassar. Inside were 3289 Arum Lilies that had been picked without the landowner's authority and therefore in breach of the provincial nature conservation ordinance. A fine of R300 (USD50) imposed for each defendant remains unpaid and the five are due to appear at Helderberg Magistrates' Court on 9 September.

A recent viability study into the picking of Arum Lilies in the region recommends the implementation of a pilot wetland cultivation project for the planting and harvesting of this species in order to generate income for local communities. Two initial sites for this project have already been identified.

TRAFFIC East/Southern Africa; KwaZulu-Natal Nature Conservation Service, 3 February 1999;
Saturday Star (South Africa), 13 February 1999; The Star (South Africa), 29 July 1999

ASIA

EAST ASIA

CHINA

In the early part of 1999, Linhu Ye and Wanming Tan were charged in the Haixi Prefecture, Qinghai Province, with the killing of Tibetan Antelopes *Pantholops hodgsonii* (App. I). The pair were accused of leading a group of poachers into Arjin Nature Reserve in May 1996 and killing 170 Antelopes; 120 skins were later sold. The Medium Court sentenced them to eight and four years' imprisonment, with fines of 10 000 yuan and 8000 yuan (USD1200 and USD966), respectively.

A further two poachers, Haimai Han and Xuejun Ma, have been convicted in Xining, capital of Qinghai Province, for poaching Tibetan Antelopes and have been sentenced to seven and six years' imprisonment, respectively. The pair were accused of killing 110 Tibetan Antelopes in Kekexili Nature Reserve and of selling 200 Tibetan Antelope skins. Two cars purchased with money raised from the sale of the skins were confiscated.

These two verdicts are the first since the Procuratorate of Qinghai Province issued an order in November 1998 to "take stronger measures against the illegal poaching of Tibetan Antelope."

Customs officials in Yunnan Province recently uncovered a scheme involving the smuggling of vast numbers of animals through the post. During routine checks in Ruili, on the border with Myanmar, post sacks weighing some 470 kg were found to contain skins of bear, cobra and viper. Wildlife inspectors traced the information contained on the sacks to a house where 575 python skins, 11 Tiger *Panthera tigris* (App. I) skins and numerous skins of Leopard *P. pardus* (App. I), bear and Gaur *Bos gaurus* (App. I), and a large number of monkey skulls and elephant tusks awaited dispatch by post. The suspects involved are believed to have smuggled around 5000 animal skins by post to avoid border checks. The case is under investigation.

On 7 July 1999, police in Fuzhou, capital of Fujian Province, seized a number of skins, antlers and other animal parts from a truck on its way to Guangdong Province. Later the same day, more than 1000 other animal parts were found at a smuggler's hideaway, bringing the total number of items in the haul to 1229. Items included skins of Tiger *Panthera tigris* and Leopard *P. pardus* (both App. I).

Guangming Daily, Qinghai (China), 6 February 1999 (translation by Shelly Shi, WWF China Programme); http://bbc.co.uk, 9 July 1999; China Daily (China), 8 July

HONG KONG

In December 1998, a local exporter of traditional Chinese medicines pleaded guilty to charges of illegal possession of protected species following the discovery of ivory scraps, monkey bones, rhino skin, rhino horn scraps, and medicines claiming to contain Tiger ingredients at his premises in July 1998. The case came to light in March that year after the Royal Canadian Mounted Police informed Hong Kong's Agriculture and Fisheries Department (AFD) that a shipment of TCM medicines and plants had arrived in Canada from Hong Kong in December 1997. The defendant was sentenced to two months' imprisonment and fined HKD5000 (USD645). The case was a joint operation of the AFD and Hong Kong Customs & Excise officials.

On 22 January 1999, at the Western Magistracy, Shah Syed Mujtaba was fined HKD20 000 (USD2580) for the illegal possession of 21 pieces of shahtoosh shawls. The garments were recovered from a hotel room in Central following a raid by AFD staff in December 1997.

On 25 February 1999, Bharati Ashok Assomull was convicted at South Kowloon Magistracy of illegal possession of shahtoosh shawls - garments made from the fleece of the Tibetan Antelope *Pantholops hodgsonii* (App. I). The case came to light in December 1997 when AFD officers, acting on information, raided two premises of a firm in Central and Tsim Sha Tsui and seized 140 shawls. At a court hearing in January an expert was invited to give professional evidence that the seized shawls were shahtoosh.

On 13 April, Assomull was fined HKD300 000 (USD38 687) and sentenced to three months' imprisonment suspended for 12 months. The shawls were forfeited to the Government. This fine is the highest ever imposed for a single charge of violating Hong Kong's *Animal and Plants (Protection of Endangered Species) Ordinance*. The case sets an important precedent in Hong Kong because it is the first successful prosecution that is based on the use of forensic techniques to confirm that the wool in question came from the Tibetan Antelope.

On 17 May 1999, at San Po Kong Magistracy, a man was charged with possession of two live Slow Lorises *Nycticebus coucang* (App. II) without a licence. The case came to light on 12 May when AFD officers, acting on information, posed as interested buyers and raided premises in To Kwa Wan, Kowloon. Under the *Animals and Plants (Protection of Endangered Species) Ordinance*, it is an offence to import, export or possess endangered species without a licence. The man pleaded guilty and was fined HKD20 000 (USD2580) and sentenced to two months' imprisonment, suspended for 12 months.

Agriculture and Fisheries Department Press Releases, 13 April/25 February/18 May 1999; TRAFFIC East Asia; South China Morning Post (Hong Kong), 26 February 1999

JAPAN

On 24 May 1999, police officers seized the following live animals from a pet shop in Osaka: 1 Puma *Puma concolor*, 1 Serval *Leptailurus serval*, 3 Spectacled Caimans *Caiman crocodilus*, 3 Talapoins *Miopithecus talapoin* (all App. II), the sale of which is prohibited by Osaka prefectural ordinance.

On 1 June, police officers found 4 Orang-utans *Pongo pygmaeus* and 1 Siamang *Hylobtates syndactylus* (both App. I) at the above premises. The case is under investigation.

On 25 June 1999, police officers seized 16 live and 2 stuffed Radiated Tortoises *Geochelone radiata* (App. I) (between 5 cm and 30 cm in length) from a pet shop in Kanagawa prefecture. The sale of specimens of Appendix I-listed species is prohibited under domestic law. The case is under investigation.

TRAFFIC East Asia

TAIWAN

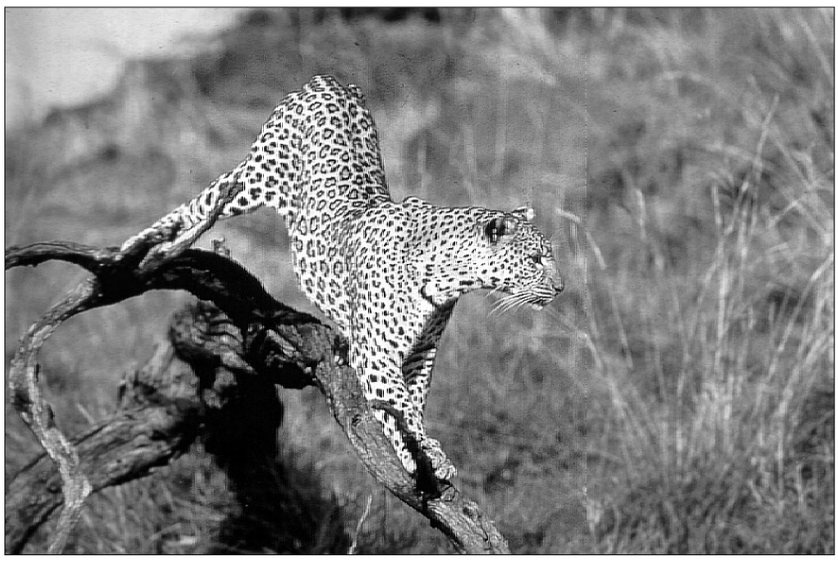
On 6 March 1999, harbour police in Kaohsiung county confiscated two mullet fishing boats with 350 kg of dolphin meat aboard. The two vessels were manned by more than 20 fishermen who admitted to catching a total of five dolphins. All cetaceans are protected under Taiwan's *Wildlife Conservation Law.* Two of the boats' owners were arrested.

On 17 March 1999, Customs officials at Chiang Kai-shek International Airport discovered 156 amphibians and reptiles concealed in luggage belonging to a man arriving from Bangkok, Thailand. The animals included 18 milk snakes *Lampropeltis triangulum annulata*, 6 Boa Constrictors *Boa constrictor* (App. I/II) and 132 Veiled Chameleons *Chamaeleo calyptratus* (App. II); 32 of the chameleons, all of which had been placed in plastic boxes, had perished. Taipei Zoo is caring for the remaining animals.

TRAFFIC East Asia; The China Post (Taiwan), 18 March 1999; The Liberty Times (Taiwan), 7 March 1999

continued...

Caiman crocodilus *is a widespread and abundant species, with several subspecies, and successfully supports international trade of over 500 000 skins annually from sustainable programmes. Substantial quantities of illegal skins continue to pass from South America to consuming and manufacturing countries, however.*



M. & C. Denis-Huot/WWF/BIOS/TRAFFIC

< **Leopard *Panthera pardus* (App. I)**

SOUTH ASIA
INDIA

The following seizures of Tiger and Leopard parts, and related arrests, took place between November 1998 and May 1999:

1 November 1998: 1 Tiger *Panthera tigris* skin. 3 arrests. Delhi.
6 December: 1 Tiger skin. 1 arrest. Kotwali District, Uttar Pradesh (UP).
13 January 1999: 1 Tiger skin. Dehradun, UP.
15 February: 1 Tiger skin; 3 Leopard *P. pardus* skins. 15 arrests. Hoshangabad District, Madhya Pradesh (MP).
24 February: 2 Tiger skins and 2 Leopard skins. 5 arrests. Bilaspur, MP.
28 March: 1 Tiger skin. 2 arrests. East Delhi.
19/20 April: 6 complete Tiger skeletons (55 kg); 3 Tiger skins; 6 Leopard skins. 15 arrests. Near Kanha Tiger Reserve, Balaghat District, MP.
21 April. 1 Tiger skin. 2 arrests. Pilibhit Forest Division, near Indo-Nepal border, UP.
24 April: 84 kg of Tiger bones. Dharchula, near Indo-Nepal border, UP.
25 April: 1 Tiger skin. Near Kagaznagar, Adilabad District, Andhra Pradesh.
20-29 May: 2 Tiger skins; 2.5 kg of Tiger bones; 2 Leopard skins. 8 poachers and traders arrested. Near Melghat Tiger Reserve, Maharashtra. The traders had offered to supply up to 50 kg of Tiger and Leopard bones.

TRAFFIC India

SOUTHEAST ASIA
MALAYSIA

On 29 March 1999, police seized 120 Asian Cobras *Naja naja* (App. II) in a raid in Rantau Panjang, in the State of Kelantan. The snakes, believed to have been smuggled into the State, were packed in 18 small baskets that had been loaded from a sampan onto a lorry. They were reportedly destined for delivery to restaurant owners in Tanah Merah and to other States. One man was arrested and fined RM1000 (USD263).

On 23 May, in what is believed to be a related incident, police in Rantau Panjang seized 3000 snakes of various species from a house in Pengkalan Haram Bagus, following a tip-off. The snakes, contained in 149 baskets, were being carried from a small boat to the house; the four men involved in the incident managed to flee.

On 12 April 1999, the anti-smuggling unit in Perlis State foiled an attempt to smuggle 105 Asian Cobras *Naja naja*, 2441 Common Rat Snakes *Ptyas mucosus* (both App. II) and 377 Pit vipers Viperidae spp. into the country via the town of Padang Besar at the border with Thailand. The lorry-load of reptiles were recovered from 400 boxes. One man was arrested.

TRAFFIC Southeast Asia; New Straits Times (Malaysia), 31 March 1999; The Sun (Malaysia), 25 May 1999; The Star (Malaysia), 13 April 1999; Department of Wildlife and National Parks, Peninsular Malaysia

PHILIPPINES

On 17 December 1998, at Ninoy Aquino International Airport, Manila, officials from the Bureau of Fisheries & Aquatic Resources (BFAR) seized 812 kg of Whale Shark *Rhincodon typus* meat. The shipment, declared as "chilled dogfish", consisted of 23 boxes that had arrived from the island of Palawan, bound for Taiwan, where Whale Shark meat is considered a delicacy.

The Government of the Philippines banned the killing and sale of Whale Sharks on 25 March 1998.

Bureau of Fisheries & Aquatic Resources, Philippines; TRAFFIC International

OCEANIA

AUSTRALIA

On 16 November 1998, at the Court of Petty Sessions, Perth, Shinji Sugimoto and Mikako Sigami of Japan pleaded guilty to charges of attempting to export wildlife in contravention of *The Wildlife Protection (Regulation of Exports and Imports) Act 1982* and State legislation. The couple, who had married in Brisbane and travelled to Western Australia, were arrested after police had searched their luggage as they prepared to leave Perth on a flight to Japan. Wrapped inside wedding present parcels, Customs officers found 3 Western Swamp Turtles *Pseudemydura umbrina* (App. I); 1 Thorny Mountain Devil *Moloch horridus*, 1 Spiny-tailed Gecko *Diplodactylus ciliaris* and 4 skinks; a further 6 skinks and a Western Blue-tongued Lizard *Tiliqua occipitalis* were found in an air parcel dispatched by the couple. Sugimoto was fined AUD13 000 (USD8600) and AUD135 costs; Sigami was fined AUD6000 and AUD135. The couple were also fined AUD4500 for breaching State legislation.

Investigations Case Officer, Australian Customs Service, Western Australia

AMERICAS

ECUADOR

On 31 March 1999, 17 500 sea cucumbers were seized at Isabela Island Airport in the Galapagos Islands. The incident occurred after inspectors from the Galapagos National Park observed boxes and suitcases being unloaded from a Civil Aviation vehicle and transferred to a plane bound for Guayaquil, on the mainland. The luggage did not bear the requisite pre-check and destination labels. Although the sea cucumber fishery was opened for a period of two months from 1 April, the specimens in this consignment had already been processed, indicating that they had been caught well before this date. A sergeant from Ecuador's Air Force was transferred to Guayaquil and will be subject to military proceedings for the offence. The other person involved, a Mrs Flores, the owner of the sea cucumbers, was fined (sum unknown) and the sea cucumbers were confiscated and later sold at auction. The money received has been deposited in the conservation accounts of the Galapagos National Park.

El Comercio (Ecuador), 3 April 1999; TRAFFIC International

USA

On 29 October 1998, in Brooklyn District Court, Andrzej Leplowski, Helena Koczuk and Wieslaw Rozbicki were charged with smuggling 450 kg of caviar into New York's John F. Kennedy International Airport, on a flight from Poland via Finland. Six other passengers arriving in New York with Leplowski the previous day claimed that they were being paid by Koczuk and Rozbicki to bring the caviar into the country and were to meet the pair at the airport terminal where they would receive payment in return for the caviar. When arrested, Koczuk had four envelopes containing a total of USD2600 in cash and Rozbicki three envelopes containing USD1500. Agents seized 901 tins of caviar (450 kg) from suitcases. The caviar is to be DNA-tested but is believed to have originated in Russia's Caspian Sea. Koczuk and Rozbicki, both residents of Stamford, Connecticut, were freed on USD25 000 personal recognizance bonds and Leplowski, a Polish national who entered the USA illegally, was detained. The case is under investigation.

TRAFFIC North America

Pilot Study of the Traditional Medicine Trade in Nigeria

With reference to wild fauna

O.A. Sodeinde and D.A. Soewu

INTRODUCTION

Despite the prevalence of traditional medicine trade in suburban and rural areas of Nigeria (Ntiamoa-Baidu, 1987), only anecdotal references to the nature and dynamics of this trade are available (Afolayan, 1980; Anadu *et al.,* 1988). The lack of information about this trade and about the impact such harvesting or trade might be having on wild animal species, prompted the authors to initiate a pilot study in several Nigerian towns during 1994. The aim was to determine which wild animal species are used as traditional medicine ingredients, their uses, and whether the trade includes protected species. The following report, which presents the findings of the pilot study, is based on a paper that was presented at the first Pan African Symposium on Sustainable Use of Natural Resources and Community Participation, held in Harare, Zimbabwe, in June 1996. Further investigation of the traditional medicine trade throughout Nigeria is planned.

METHODS

The term 'traditional medicine' in the context of this report is used to refer to the use of wild animals to treat physiological or psychological ailments, and their application for ceremonial, religious or spiritual purposes associated with healing.

A total of 64 traders selling traditional medicine ingredients at markets in five southwestern Nigerian towns were interviewed between January and April 1994. The species of wild animals stocked by each trader (one trader per stall) were recorded by means of an open-ended questionnaire to avoid yes/no answers and to encourage maximum discussion. The exact numbers of each species being offered were not counted in order to avoid making respondents wary of the nature of the researchers' work. One market per town was visited on selected market days, which are held every five days. The traders were distributed in the following suburban towns: Ago-Iwoye (18 traders), Ijebu-Igbo (13), Ijebu-Ode (15) and Oru (7), and in the capital of Oyo State, Ibadan (11). Five traditional healers in Ago-Iwoye (3) and Ijebu-Ode (2) were also interviewed.

Information collected from the traders included the identity of wild animal species stocked and their uses in traditional medicine preparations; the form in which the animals are supplied (for example, whole or parts), and their selling prices. The traditional healers were asked which species they used for traditional medicine preparations and the associated uses.

In order to determine the diversity of application of each species, the animals seen on sale were grouped into five categories according to their uses.

1) use in the preparation of preventive and curative medicines;

2) use in preparing fertility medicines for women;

3) use in the preparation of aphrodisiacs and potency medicines for men;

4) use in appeasing and invoking spirits and traditional gods;

5) use for other conditions.

At the time of the survey the exchange rate for the Nigerian Naira was NGN22 to the US dollar. The annual per capita income in Nigeria was below USD400.

Species		Local name	Protection Status CITES[1] / Nigeria[2]		Frequency of occurrence[3]	Whole[4]	Parts[5]	NGN[6]
MAMMALIA								
Maxwell's Duiker	*Cephalophus maxwelli*	Etu	-	-	-	9	16	30-300
African Civet	*Civettictis civetta*	Eta	III/BW	2	1.7%	1	13	80-270
Colobus Monkey[7]	*Colobus* spp.	Edun	I/II	1	2.5%	1	18	80-300
Giant Rat	*Cricetomys gambianus*	Okete	-	-	-	22	-	120-180
Shrew	*Crocidura* spp.	Asin	-	-	-	15	-	15-25
Spotted Hyaena	*Crocuta crocuta*	Ikoko	-	1	0.9%	-	7	100-200
Beecroft's Hyrax	*Dendrohyrax dorsalis*	Awawa	-	-	-	1	18	50-25
Straw-coloured Fruit Bat	*Eidolon helvum*	Adan	-	-	-	12	-	90-100
Patas Monkey[7]	*Erythrocebus patas*	Ijimere	II	2	2.8%	3	18	80-360
Wild Cat[7]	*Felis silvestris*	Ologbo-oko	II	1	1.7%	-	13	70-150
Gorilla	*Gorilla gorilla*	Inaki	I	1	7.3%	-	55	120-450
Slender Mongoose[7]	*Herpestes sanguineus*	Kolokolo	-	2	0.8%	-	6	100-180
Roan Antelope[7]	*Hippotragus equinus*	Agbagudu	-	2	1.9%	-	14	80-150
Crested Porcupine	*Hystrix cristata*	Oore	III/GH	-	-	2	15	25-280
Punctated Grass Rat[8]	*Lemniscomys striatus*	Eku	-	-	-	-	-	-
Serval	*Leptailurus serval*	Ekun	II	1	6.5%	-	49	300-3700
African Elephant	*Loxodonta africana*	Erin	I	1	0.9%	-	7	100-250
White-bellied Pangolin	*Manis tricuspis*	Arika	II	1	4.5%	34		80-320
Lion[7]	*Panthera leo*	Kiniun	II	1	0.9%	-	7	400-5000
Leopard	*Panthera pardus*	Amotekun	I	1	1.3%	-	10	150-350
Chimpanzee	*Pan troglodytes*	Obo	I	1	4.4%	3	30	100-400
African Buffalo	*Syncerus caffer*	Efon	-	-	-	-	5	80-250
Greater Cane Rat	*Thryonomys swinderianus*	Oya	-	-	-	6	15	35-420
Bushbuck	*Tragelaphus scriptus*	Igala	-	-	-	2	16	70-200
Geoffroy's Ground Squirrel	*Xerus erythropus*	Ikun	-	-	-	3	20	60-170
AVES								
Speckled Pigeon[9]	*Columba guinea*	Eyele	III/GH	-	-	-	-	-
Pied Crow[9]	*Corvus albus*	Akalamagbo	-	-	-	-	-	-
Double-spurred Francolin	*Francolinus bicalcaratus*	Agbaro	-	-	-	2	6	-
Black Kite[7,8]	*Milvus migrans*	Asa	II	1	1.3%	-	10	-
Hooded Vulture	*Necrosyrtes monachus*	Igun	II	2	3.1%	-	23	80-580
Helmeted Guineafowl	*Numida meleagris*	Eyeawo	-	-	-	-	-	-
Indian Peafowl	*Pavo cristatus*	Okin	-	-	-	-	3	20-350
Little Grebe	*Tachybaptus ruficollis*	Ako	-	-	-	-	11	20-70
African Grey Parrot	*Psittacus erithacus*	Ayeko-oto	II	1	1.1%	3	5	60-380
Barn Owl	*Tyto alba*	Owiwi	II	-	-	1	5	50-250
REPTILIA								
Common Rock Lizard	*Agama agama*	Alangba	-	-	-	4	-	20-35
Gabon Viper	*Bitis gabonica*	Paramole	-	-	-	2	5	20-90
Senegal Chameleon	*Chamaeleo senegalensis*	Oga	II	-	-	35	-	35-80
Nile Crocodile	*Crocodylus niloticus*	Oni	I/II	1	1.2%	3	6	80-600
Mamba	*Dendroaspis* sp.	Sebe	-	-	-	-	9	35-90
Tortoise	*Kinixys* spp.	Ajapa	-	-	-	27	-	80-250
Cobra	*Naja* sp.	Agbagi	-	-	-	-	12	30-100
African Python	*Python sebae*	Ere	II	1	1.7%	-	13	40-130
Nile Monitor	*Varanus niloticus*	Awon-rinwon	II	1	1.6%	2	10	50-400
GASTROPODA								
African Giant Snail	*Archachatina marginata*	Igbin	-	-	-	57	-	30-40

Table 1. Species offered for sale by 64 traders at markets in southwestern Nigeria, January to April 1994, the number of stalls on which the trophy and or whole animal of each species occurred, and their price ranges.

[1]*CITES Appendix listing.*

[2]*listing in Schedules 1 or 2 of Nigeria's* Endangered Species (Control of International Trade and Traffic) Decree No. 11, 1985.

[3]*relative frequency of occurrence of protected species.*

[4]*some specimens were alive, but the majority were dead; dead specimens (in particular larger forms) were fresh or (smaller forms) had been dried.*

[5]*bones, hooves, scales, fresh, feathers, etc.*

[6]*prices are either for the whole animal only or whole animal and parts.*

[7]*conditions treated were not disclosed.*

[8]*several* Rodentia *and* Falconiformes *species were seen but only those identified are indicated.*

[9]*frequency on stalls was not enumerated and selling prices were not given.*

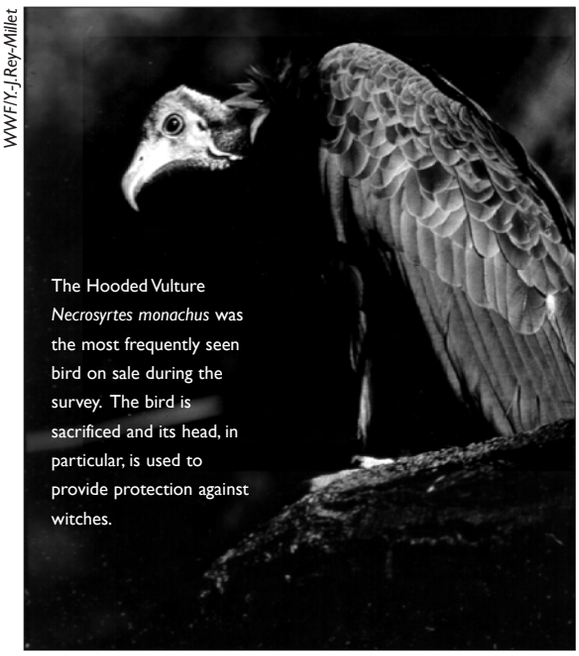
LEGISLATION

The Endangered Species (Control of International Trade and Traffic) Decree No. 11 of 1985 (Anon., 1985) contains a list of species that are threatened in Nigeria. The hunting, capture of, or trade in the animal species specified in Schedule 1 (animal species threatened with extinction) is prohibited. The same activities for species listed in Schedule 2 (which are regarded as less vulnerable than Schedule 1 species), are allowed only under licence. Penalties for contravening the decree range from fines to imprisonment.

RESULTS

Whole animals or trophies of 45 species were found on sale at the markets surveyed (Table 1). The four most commonly offered mammalian species seen were the Gorilla *Gorilla gorilla*, Serval *Leptailurus serval*, White-bellied Pangolin *Manis tricuspis* and Chimpanzee *Pan troglodytes*, and available at the stalls in the following percentages - 86%, 77%, 53% and 52% - respectively; all animals, with the exception of the pangolin, were dead. The first three species attracted the most diverse uses. All are protected in Nigeria and are listed in the CITES Appendices.

The Hooded Vulture *Necrosyrtes monachus* was the most frequently seen bird and offered by 36% of all stalls surveyed, and the Senegal Chameleon *Chamaeleo senegalensis* the most commonly available reptile (55%). The only invertebrate species seen, the African Giant Snail *Archachatina marginata*, occurred on 89% of stalls. The dried forms of representatives of two families - the Muridae and Falconidae - could not be identified to species level. Animal parts were stocked more than whole animals (Table 1) and most of the pangolins, tortoises and snails on sale were alive. Body parts of species used in some traditional medicine formulas are indicated in Tables 2 to 6.



WWF/Y.-J.Rey-Millet

The Hooded Vulture *Necrosyrtes monachus* was the most frequently seen bird on sale during the survey. The bird is sacrificed and its head, in particular, is used to provide protection against witches.

African Giant Snails *Archachatina marginata*, considered an aphrodisiac, were available on most of the stalls surveyed.

Photo: TRAFFIC/R. Barnett

Nineteen of the 45 species surveyed are listed as threatened in *Decree No. 11*. Five of these species are listed in CITES Appendix I. The Senegal Chameleon, the most frequent reptile seen on sale at market stalls, is not listed in *Decree No. 11* but, along with all *Chamaeleo* spp., it is listed in CITES Appendix II. The White-bellied Pangolin is also listed in CITES Appendix II.

Species		Part used	Condition
Maxwell's Duiker	*Cephalophus maxwelli*	leg bones	rheumatism
Nile Crocodile[1]	*Crocodylus niloticus*	heart/blood	stabilizing osmoregulation in pregnant women
Beecroft's Hyrax	*Dendrohyrax dorsalis*	skull bone	recurring boil on head
Double-spurred Francolin	*Francolinus bicalcaratus*	feather/bone	fever
Gorilla[1]	*Gorilla gorilla*	bone	strength and vitality for pregnant women/foetus
		intestine	intestinal parasites (worms)
Serval[1]	*Leptailurus serval*	flesh	leprosy
		tongue	rheumatism
White-bellied Pangolin[1]	*Manis tricuspis*	whole female	extrusion of placenta after parturition
Leopard[1]	*Panthera pardus*	skin	snake poison
African Buffalo	*Syncerus caffer*	skin	elephantiasis
		eyeballs	loss of hearing/speech/eyesight
		bones (caudal)	vertebral column fracture
		liver	prolonged pregnancy; extrusion of placenta after parturition
Bushbuck	*Tragelaphus scriptus*	skull	human skull fracture
Nile Monitor[1]	*Varanus niloticus*	whole	leprosy

Table 2. Wild animals and their parts used in preparation of preventive and curative medicines.
[1]*species officially listed in Nigeria as endangered.*

Species		Part Used	Method of administration
Giant Rat	*Cricetomys gambianus*	whole	Cooked with other ingredients[2] and eaten
Straw-coloured Fruit Bat	*Eidolon helvum*	whole	Cooked with other ingredients[2] and eaten
Crested Porcupine	*Hystrix cristata*	spines	Powdered with other ingredients[2] and eaten
African Elephant[1]	*Loxodonta africana*	liver	Cooked with ingredients[2] and eaten
Leopard[1]	*Panthera pardus*	bone	Prepared into a mixture and eaten
Giant Cane Rat	*Thryonomys swinderianus*	whole	Cooked with other ingredients[2] and eaten
Bushbuck	*Tragelaphus scriptus*	tail/legs/flesh	Powdered and swallowed
Geoffroy's Ground Squirrel	*Xerus erythropus*	whole	Cooked with other ingredients[2] and eaten

Table 3. Wild animals and their parts used in preparing fertility medicines for women.
[1]Species officially listed in Nigeria as endangered. *[2]including other animals and herbal ingredients.*

Species		Part Used	Method of administration
African Giant Snail	*Archachatina marginata*	whole	Cooked with ingredients[2] and eaten
African Giant Rat	*Cricetomys gambianus*	tail	Powdered with ingredients[2] and eaten
Nile Crocodile[1]	*Crocodylus niloticus*	head scale	Powdered with ingredients[2] and eaten
Spotted Hyaena[1]	*Crocuta crocuta*	bone	Prepared into a mixture for bathing
Beecroft's Hyrax	*Dendrohyrax dorsalis*	whole	Powdered with other ingredients[2] and eaten
Gorilla	*Gorilla gorilla*	bone	The powder is rubbed into fresh incisions on different parts of the body
Tortoise	*Kinixys* spp.	whole	Cooked with ingredients[2] and eaten
Chimpanzee[1]	*Pan troglodytes*	penis	Powdered with ingredients[2], cooked with corn flour and eaten
African Buffalo	*Syncerus caffer*	tail/penis	Prepared into a mixture for bathing
Giant Cane Rat	*Thryonomys swinderianus*	heart/whole	Cooked with ingredients and eaten
Common Rock Lizard	*Agama agama*	head	Powder is rubbed into fresh incisions on different parts of the body
Geoffroy's Ground Squirrel	*Xerus erythopus*	penis	Powdered with ingredients[2] and eaten

Table 4. Wild animals and their parts used in the preparation of aphrodisiacs and potency medicines for men.
[1]Species officially listed in Nigeria as endangered. *[2]including other animals and herbal ingredients.*

Uses of Traditional Medicines

The traditional medicinal uses of wildlife cited by those interviewed ranged from the prevention and cure of diseases such as fever and leprosy, to the making of good luck charms and the prevention of accidents, among others (Tables 2 to 6). Both endangered and common species were mentioned in each of the five categories, with mammals featured more than any other animal group: eight species are used in the preparation of fertility medicines for women (Table 3). Certain mammals, reptiles and molluscs were quoted as being used in the preparation of aphrodisiacs and potency medicines for men: the ingredients used in these preparations are ground into a powder and applied directly to the skin or ingested alone or after being cooked with other ingredients (Table 4). The Gorilla was found to be utilized in the most diverse number of ways, including for the protection of males against "sexual poisons" implanted in females to curb promiscuity. It was found that the most common use of the species seen was as good fortune charms.

Discussion

Species richness and traditional medicine use

Ntiamoa-Baidu (1987) observed that every major town in West Africa had at least one local market which sold traditional medicine ingredients. The network of traders in traditional medicines is, therefore, potentially large in Nigeria, a country with an area of 924 000 km^2 and an estimated 100 million people, most of whom live in suburban and rural areas.

The number of wildlife species recorded in this survey is lower than the 55 species encountered by Taylor and Fox (1992) in the Lomé Fetish Market, Togo, during a survey recording the availability of wildlife species, but is higher than was reported for studies of the bushmeat trade, which documented 28 species in Liberia (Jeffrey, 1977) and 25 species in southwestern Nigeria (Anadu *et al.,* 1988). More recent information is not available. Most of the species encountered during the survey under discussion were recorded during surveys of species used as fetishes, and in culture and religious

festivals (Ntiamoa-Baidu, 1987, Adeola, 1992, and Taylor and Fox, 1992). Three of the five species listed by Ntiamoa-Baidu (1987) as used by Ghanaians in traditional medicine - the African Elephant *Loxodonta africana*, African Grey Parrot *Psittacus erithacus* and Hooded Vulture *Necrosyrtes monachus* - were found to be utilized in the current survey and for the same purposes. The uses ascribed to most species by other authors are similar to those indicated by the respondents in the current survey (although the use of similar species should not always presuppose similar applications). Examples include the use of the Bushbuck *Tragelaphus scriptus* in making charms (Anadu *et al.,* 1988), bats used as charms and for curing infertility in women (Taylor and Fox, 1992) and pangolins, which are considered to bring good luck (Bräutigam *et al.,* 1994). In fact the pangolin, found to be used for a wide variety of purposes, has been rated as one of the most consistently used species in traditional medicine throughout Africa (Bräutigam *et al.,* 1994).

Substituting threatened species in traditional medicines

The high number of specimens of threatened species available on traditional medicine stalls shows either a lack of awareness of the existence of *Decree No. 11* or of the implication of this law, or that the traders know that the law in not enforced. The use of threatened species can be reduced by substituting common species for threatened ones in traditional medicine recipes, where suitable. However, substitutes may not always be feasible because recipes using different species may not have the same efficacy. Nor may it be advisable without a thorough examination into the sustainability of utilizing substitute species to ensure the viability of any such exploitation. More facts on this subject must be collected from traditional healers, the end-users.

Species		Part used	Specific condition
Maxwell's Duiker	*Cephalophus maxwelli*	hoof	invoking witches
African Giant Rat	*Cricetomys gambianus*	whole	appeasing traditional gods
Crested Porcupine	*Hystrix cristata*	intestine/spine	invoking witches
Tortoise	*Kinixys* spp.	whole	appeasing god of the sea
Hooded Vulture	*Necrosyrtes monachus*	head	invoking witches/protection against witches
Leopard[1]	*Panthera pardus*	bone/eye/skin	invoking/protection against witches
Chimpanzee[1]	*Pan troglodytes*	left hand	invoking witches
African Grey Parrot[1]	*Psittacus erithacus*	whole	invoking witches/protection against witches
African Python[1]	*Python sebae*	head	invoking witches/protection against witches
African Buffalo	*Syncerus caffer*	nose	invoking witches
		head	appeasing traditional gods
Bushbuck	*Tragelaphus scriptus*	whole	appeasing witches
Barn Owl	*Tyto alba*	whole	invoking witches/protection against witches
Nile Monitor[1]	*Varanus niloticus*	whole	invoking witches/protection against witches

Table 5. Wild animals and their parts used as a sacrifice to appease and invoke spirits and traditional gods.
[1]Species officially listed in Nigeria as endangered.

Species		Part used	Purposes Used
Senegal Chameleon	*Chamaeleo senegalensis*	whole	making recipient invincible to detractors/charm
African Giant Rat	*Cricetomys gambianus*	tail	prevention of accidents
Beecroft's Hyrax	*Dendrohyrax dorsalis*	toes	prevention of accidents
Straw-coloured Fruit Bat	*Eidolon helvum*	tongue/intestine	immunity against food poison/charm
Double-spurred Francolin	*Francolinus bicalcaratus*	head/feathers	good fortune
Gorilla[1]	*Gorilla gorilla*	tail	prevention of attack by robbers and of infant mortality
		arm	immunity against harmful substances if accidentally handled
		penis	immunity against sexual poison
Serval[1]	*Leptailurus serval*	flesh/hand/leg/toes	fortune
White-bellied Pangolin[1]	*Manis tricuspis*	head (with eyes intact)	treating/curing kleptomania
		whole	good fortune
Hooded Vulture[1]	*Necrosyrtes monachus*	whole	good fortune
African Grey Parrot[1]	*Psittacus erithacus*	egg	good fortune
Giant Cane Rat	*Thryonomys swinderianus*	liver/heart	strengthening relationship between couples
Bushbuck	*Tragelaphus scriptus*	heart	immunity against food poison/charm

Table 6. Wild animals and their parts used as charms in ameliorating/treating other conditions.
[1]Species officially listed in Nigeria as endangered.

Cross-border trade

Because the use of wildlife species for traditional medicine is common in sub-Saharan Africa, there is potential for cross-border trade in traditional medicine ingredients. Some reports reviewed by Bräutigam *et al.,* (1994) indicated the existence of such trade. One of these reported illegal cross-border trade in pangolin scales between Nigeria and Niger.

CONCLUSIONS

Given the short duration of this study, it was not possible to determine the current trends in the supply and availability of animals used in traditional medicine in Nigeria. A comprehensive survey, similar to that carried out by Marshall (1998), which looked at species used in wildlife medicinals in east and southern Africa and Madagascar and identified those species most in need of conservation, management and/or research attention, should be undertaken in Nigeria. Such a study should investigate, for example, whether the availability of species fluctuates during the year, whether certain species are becoming difficult to find, how frequently fresh specimens are procured and how long preserved specimens are kept, and what the turnover rate is. Beyond the supply and demand of animals/animal parts, a thorough appraisal of the economics of the trade is needed. In this regard, information on profitability, costs, sales volume, losses in storage, alternative sources of income, etc., need to be collected.

From this study it can be surmised that:

1) although the actual number of traders in animals and animal parts for traditional medicine in Nigeria is not known, the network of traders is potentially large;

2) more facts should be obtained from traditional healers about the feasibility of substituting thriving species for threatened ones in traditional medicine recipes and investigation made to ensure that any such exploitation is sustainable and well managed;

3) the existence of cross-border trade in animals and animal parts for traditional medicine within Africa, and the volume of such trade, needs to be determined before recommendations can be made to improve regulation of the trade, particularly within the context of CITES.

ACKNOWLEDGEMENTS

The authors would like to thank Andrew Venter, Linda Mhlanga, Solo-Raharinjanahary Raharimalala and other participants at the first Pan African Symposium on Sustainable Use of Natural Resources and Community Participation for their comments on the original manuscript. Olufemi Sodeinde wishes to thank the symposium organizers - IUCN-The World Conservation Union, the International Co-operation Centre in Agronomic Research and Development (CIRAD), and the French Institute for Research in Africa (IFRA).

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Bolivia's Trade in Hairy Armadillos

B. Peredo

Introduction

The Hairy Armadillo *Chaetophractus nationi*, indigenous to Bolivia and northern Chile has, since remote times, formed an important part of the culture and folklore of the Andean region of Bolivia. The animal's shell is traditionally used in the manufacture of musical instruments, and other body parts are fashioned into handicrafts and amulets (charms, or pieces of jewellery worn as a protection against evil). This demand continues in Bolivia despite a prohibition on the capture of and trade in the species and, together with the effects of expanding agricultural practices and habitat use for human activities, has had a serious impact on Hairy Armadillo populations: the Bolivian authorities believe the species may be extinct in that country within 10 years if the current trend continues (Anon., 1997).

This report summarizes the findings of a study by Tamandua, a non-governmental organization that works closely with local communities in Bolivia and with the country's Ministry of Sustainable Development and Planning[1] to assist in the sustainable management of Hairy Armadillos and other species that have an economic value. The study aimed to determine the threats to the Hairy Armadillo, and to establish a framework that would allow important traditional uses of this animal, and the corresponding economic and cultural benefits, to continue, while ensuring that population management also benefits the species. As a consequence of the study, the Ministry of Sustainable Development and Planning, through the General Directorate of Biodiversity (DGB)[2], is developing a national conservation programme for the Hairy Armadillo, in conjunction with Tamandua.

Methods

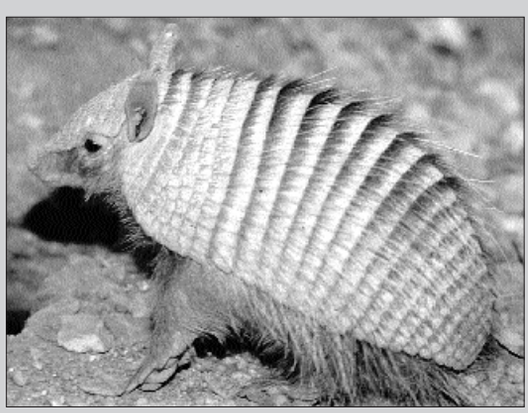
The study covered the period August 1995 to June 1998. Six researchers interviewed officials at the Wildlife Unit of the Ministry of Sustainable Development and Environment [Planning], and the traders and local communities in Bolivia that utilize Hairy Armadillos for traditional, ceremonial and commercial purposes. Additional information was gleaned from other preliminary research being undertaken on this subject (Reichle, 1996).

The focus of the study was on the cities of La Paz and Oruro, in particular, and their respective rural districts, and the cities of Cochabamba and Santa Cruz. Visits were made to the principal markets in La Paz, El Alto, Oruro, Cochabamba and Santa Cruz. Two national parks, Sajama National Park in Oruro and Lauca National Park in northern Chile, locations that are within the species' range, were also included in the area of study.

The rate of exchange used in the report is Bolivianos 5.50 to the US dollar which is the average rate of exchange during the period of study.

Description and Distribution

The Hairy Armadillo, or *quirquincho* as it is called locally, weighs between 1.5 kg and 3 kg, and is encased in an armour which consists of a head shield and a small shield between the ears on the back of the neck. A portion of the body carapace has some 18 bands of which usually seven to eight are moveable. Hairs project from the scales of the body armour, and the limbs and belly are covered with whitish or light brown hairs (Nowak, 1991).



An estimated 1950 Hairy Armadillos *Chaetophractus nationi* are harvested every year, approximately half of which are used to make traditional Bolivian musical instruments. Fewer than 10 000 specimens are thought to survive in the wild.

Photographs by Bernardo Peredo/Bolivian Photo Agency

[1]*formerly, and until December 1997, the Ministry of Sustainable Development and Environment*

[2]*formerly the National Directorate of Conservation of Biodiversity (DNCB)*

The animal inhabits burrows in sandy areas on plateaus in the semi-arid *puna* region of Central Altiplano, at altitudes of 3500-4300 m or more (Ergueta and de Morales, 1996). This area occupies *circa* 1250 km^2, in the counties of La Paz and Oruro. Isolated populations of Hairy Armadillos can be found north of Potosi and northeast of Cochabamba (Anderson, 1993), and a fragmented population occurs in northern Chile (Redford and Eisenberg, 1989). There is a question over whether *C. nationi* is a valid species or a subspecies of *C. vellerosus* (Waller, T., cited in Anon., 1997); apart from a few small differences, individuals of these two taxa are hard to tell apart.

Conservation Status

Two important factors responsible for the destruction of the Hairy Armadillo's natural habitat are the extraction of sand for use in construction and road building, and expanding agricultural practices (Anon., 1997). The precise rate of this destruction is not known. A census in Bolivia in 1995 recorded 3604 active Hairy Armadillo burrows and 3221 inactive burrows in the area of distribution of *C. nationi* (Anon., 1997). Based on an estimated total population of 10.6 individuals per km^2 and one specimen per burrow, the total population of the species has been estimated as between 3212 and 13 250 individuals, depending on the survey methodology (Anon., 1997). The species has a low reproductive rate and no data on population or geographic trends are known (IUCN, 1997). Reviewers of a 1997 proposal (Anon., 1997) to list the species in CITES Appendix I indicated that the animal's range may be greater than recorded, which suggests that the total population of this species may be higher than these estimates. However, despite minor anatomical differences between this species and other native armadillos (*C. vellerosus* and *C. villosus*), manufactured products derived from them are less easy to tell apart, and harvest levels may therefore be overestimated (IUCN, 1997).

The author has observed that the demand for armadillo shell is declining. Hunters and traders in the region of Oruro and La Paz report that, increasingly, they have to travel further afield to locate specimens (Peredo *et al.,* 1997), often beyond the species' known area of distribution and into an area where *C. vellerosus* is found. Since initial research for this report was carried out, artisans have revealed that some instruments and handicrafts using armadillo parts have more recently derived from *C. vellerosus* specimens that were hunted near the city of Tarija, in the south of the country. This trade has not yet been investigated.

Legislation

The national law of Bolivia concerning the use of Hairy Armadillos is unclear. The capture, possession and sale of all species of flora and fauna in Bolivia are prohibited under *Supreme Decree 22641*. The *General Environmental Law No. 1333*, Article 11, states that it is illegal for any person to incite, promote, capture and/or trade in an animal (or its derivatives), that has been hunted, held, bought or transported without authorization or which action has been declared prohibited. However, supreme decrees issued in March and July 1997 respectively allow for the harvest and sustainable use of Vicuña *Vicuna vicuna* and Yacare Caiman *Caiman yacare* under the control and supervision of the Ministry of Sustainable Development and Planning of the DGB. *Supreme Decree 22641* is to be modified in 2000 so that all species subject to the requirements set out in this legislation will be listed.

Recently, however, the Prefecture of Oruro, through the Ministry of Sustainable Development and Planning, established *Resolution No. 111/98* of 24 March 1998, which prohibits the hunting of the Hairy Armadillo in Oruro and, confusingly, promotes the "protection, conservation and sustainable use" of this species. Those infringing this law face a gaol sentence. The establishment of this law had not been communicated to the federal Government, however, until so notified by the author.

At the tenth meeting of the Conference of the Parties to CITES, in 1997, Bolivia put forward a proposal to include the Hairy Armadillo in Appendix I. This was amended at the meeting to an Appendix II-listing with a zero quota, and adopted. Such a listing, which primarily applies to the exportation of products such as musical instruments and souvenirs, constitutes a great step towards the development of effective control of the species at the international level. However, although musical instruments incorporating Hairy Armadillo shells being carried by tourists or local people for sale in Chile are sometimes seized by Customs officials of the Forestry Corporation of Chile (CONAF) at Tambo Quemado, at the border with Bolivia (officials of DGB, Bolivia, and CONAF, pers. comm., 1998) such events are infrequent because trade in souvenirs is generally poorly controlled. The export of personal or household effects of species listed in CITES Appendix II is subject to permit requirements under Bolivian law and these are only issued for specimens not taken from the wild.

Supply

Hairy Armadillos destined for commercial trade are obtained in the following ways:

- A trader will travel to a known location and, in the case of new-born or young specimens, capture and transport them to a city where they are raised either for breeding or subsequently killed for the manufacture of *charangos*; older specimens are usually killed at capture; according to one interviewee, the animal is placed in a box where it dies of suffocation. This method of killing has not been possible to confirm, however.

- The animals are captured by hunters that live in close proximity to the animal, and are either sold to visiting traders or sent to the cities, La Paz and Oruro in particular, for onward sale.

- The animals are captured by people known to the traders; once a sufficient number has been collected, these hunters will travel to the cities, La Paz and Oruro in particular, to sell the specimens to middlemen for onward sale.

UTILIZATION AND TRADE

Based on observations and interviews in 1995, it is estimated that approximately 1950 Hairy Armadillos are removed from the wild each year, of which an estimated 46% are used in the manufacture of traditional musical instruments, 33% as handicrafts and souvenirs, including stuffed specimens, and the remainder as charms, in traditional medicine and as food (Caceres, 1995) (Table 1). Their average number and specific uses during recent years have been calculated as follows: 200 (used as amulets); 100 (medicines); 20 (magic sources); 80 (food and protein); 550 (*charangos*); 350 (*matracas*) [see descriptions below]; 650 (shells) (Anon., 1997).

Use in the manufacture of traditional musical instruments: The shells of Hairy Armadillos are used to form the body of *charangos* - small guitars that have 10 strings arranged in pairs of two. Although *charangos* made of wood produce a better sound, those fashioned from the hollow shell of the Hairy Armadillo are considered to be more representative of Andean culture (Peredo, 1998). The shell is also used to decorate a percussion instrument called a *matraca;* sound is produced from a small resonating box when the instrument is turned from side to side.

Use in the manufacture of handicrafts and souvenirs: Stuffed armadillos are the most commonly seen souvenirs derived from this species. Handicrafts include drums and vessels made from the animal's shell.

Use as charms, food, and in traditional medicine: A stuffed armadillo is also considered to bring luck and many shops and markets have a specimen on display. Rural communities, and, to a lesser extent, some city-dwelling communities, eat the meat and also use the oil, hair and nails in medicines or as amulets in traditional ceremonies. The nails are crushed and mixed with armadillo oil as a treatment for pain.

Principal consumers

The study found that most consumers of the Hairy Armadillo live in rural areas and occupy the same territory as this species. The indigenous Aymara people, for example, who live in the Andean region of Bolivia, in the departments of La Paz, Oruro and Potosi in particular, are on low incomes and use the armadillo to fulfil traditional customs. A local indigenous community called Uru Murato, who live in the department of Oruro, also utilize armadillos, particularly for their shells and for food and medicine. Consumers living in cities, for example La Paz and Oruro, have the same traditional customs and beliefs, but are on a higher income; tourists, mostly from Europe and the USA, purchase musical instruments such as *charangos* and *matracas,* and handicrafts made from armadillo shells. Dancers at the Carnival of Oruro and other traditional festivities each carry a *matraca* instrument. There is usually a group of between 150 and 200 dancers at each festivity. Owing to their fragility, these instruments are often damaged during the course of dancing and need to be replaced.

Item	Part of animal used	Use	Outlet
Amulet	Whole, stuffed	Kept as protection against evil; the animal's ears are decorated with coloured wool	Jewellery and department stores in Oruro, La Paz, Potosi and Cochabamba
Traditional medicine	Bones, nails, shell, oil, hair, tail, etc.	Medicine and magic beliefs	Oruro
Food	Meat, particularly the abdomen	Source of protein particularly for the Uru Murato peoples	Oruro
Whole live animal	-	Magic beliefs - when a trapped armadillo is encircled by local people, it is believed to endow those persons with the power to catch thieves and predict the future	Oruro
Charango (musical instrument)	Shell	Typical symbol of Bolivian folklore	Oruro, La Paz, Potosi, Cochabamba, Chuquisaca, Santa Cruz, Arica (Chile). Exported to USA/Europe
Matraca (musical instrument)	Shell	Used by dancers in traditional festivities	Oruro. Exported to Argentina, Chile and Peru
Shells	-	Traditional and artisanal items and souvenirs	La Paz, Oruro. Exported to Argentina, Chile and Peru

Table 1. Examples of the uses of Hairy Armadillos in Bolivia.

Outlets and prices

In spite of their protected status, products derived from Hairy Armadillos and stuffed specimens are widely seen on sale in markets and craft fairs; live animals are seen less often. The principal outlets are the artisans' markets (known as Witches' Markets) in the cities of La Paz and Oruro. An estimated combined total of 2000 items derived from the Hairy Armadillo are sold in these two cities each year (Anon., 1997; pers. obs.), fetching up to USD100 each. However, because tourists can often afford to buy these items even at inflated prices, prices do tend to fluctuate.

Reichle (1996) recorded the sale of more than 150 Hairy Armadillo shells (for use in the manufacture of *charangos),* and stuffed specimens in 20 markets and folklore shops in different locations in Bolivia in 1996. In the survey under discussion, about 100 specimens were seen in La Paz and a combined total of 100 in Oruro and Cochabamba.

	Bolivianos	USD
Charango[1]	280-550	50-100
Live animal	150-250	30-45
Stuffed animal	30-50	6-10
Shell	50	10
Souvenirs	50-60	10-11
Grease, bones, hair, tail (used in traditional medicines)	10-30	2-6

Table 2. The price of Hairy Armadillos and related products on sale in the study areas, August 1995 to June 1998.
[1]charangos on sale in Arica, Chile, fetched between USD80 and USD120 during the study period.

Discussion

The Hairy Armadillo is integral to the lives of many people in Bolivia, associated as it is with ancient practices and beliefs that form an important part of Bolivian culture. It is also a source of income, and is valued as food and as medicine. Conservation of the species will therefore depend on an adequate sustainable management programme that includes the participation of all those associated with its utilization. A national conservation programme for the Hairy Armadillo is under development by the Ministry of Sustainable Development and Planning, through the DGB, and in conjunction with the organization Tamandua. It will take into consideration the various factors - social, economic, cultural, traditional, educational, legal, biological and ecological - that contribute to the problems faced by this species, areas which, in turn, will benefit from the conservation of the Hairy Armadillo. As it is imperative to involve communities that utilize the Hairy Armadillo in the development of such a programme, it was encouraging to discover during the study that individuals indicated a willingness to pursue their activities in a sustainable manner, a factor that will be of enormous benefit in the implementation of the programme.

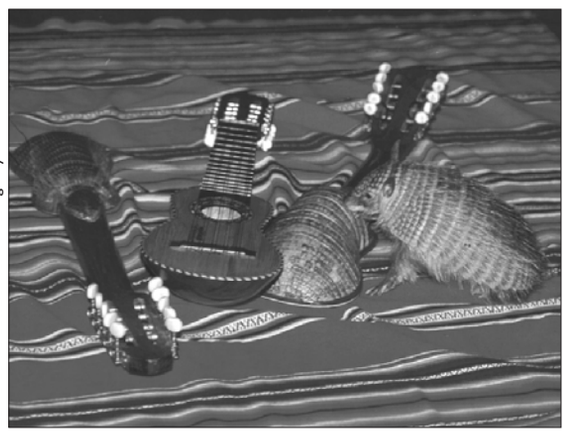
Education is a fundamental pillar in the realization of the project, as it is lack of knowledge that has, to a great extent, resulted in the species' current predicament. A legal infrastructure for the hunting of and trade in the Hairy Armadillo should be established and be widely publicised. Since an estimated 75% of Hairy Armadillos utilized are destined for commercial ends (primarily the manufacture of handicrafts and folkloric instruments), the use of viable substitutes for their manufacture should be investigated if consumption of wild-taken animals is to be reduced.

Implementation of a prohibition on the use of Hairy Armadillos for traditional practices, or the use of substitutes for such purposes, is likely to be more difficult to implement. If conservation of the species is to be ensured, while the needs of rural communities, in particular for protein and medicines and other non-commercial activities, are to be met, sustainable wild-harvesting of Hairy Armadillos must be promoted.

Recommendations

The Hairy Armadillo is being exploited in Bolivia without adequate management. If traditional use of this resource is to be allowed, or even able, to continue, conservation of the species must become a priority and involve the participation of those engaged in the trade. An overall strategy to meet the aforementioned goals would have to follow these guidelines:

a) A national conservation programme for the Hairy Armadillo, integrating all sectors and communities involved in the trade, should be established. In order to maintain traditional and cultural activities and secure and improve consumers' incomes and quality of life, it is important that alternative materials be explored and offered for the manufacture of handicrafts and musical instruments, certainly until wild populations of the Hairy Armadillo have stabilized.



Bernardo Peredo/Bolivian Photo Agency

< **A stuffed Hairy Armadillo is displayed with traditional Bolivian musical instruments called *charangos*, which are made from the Hairy Armadillo shell.**

b) A national decree should be instituted to prohibit the capture, holding, transport and use of this species until wild populations have stabilized. Existing legislation should be strengthened and enforcement improved along known trade routes, in particular on both sides of the border with Chile.

c) A census of wild populations should be undertaken within Sajama National Park (in Oruro), the only park in Bolivia where the species occurs. Scientific and ecological research of the species, in particular within the park, should be developed. Other wildlife sanctuaries should be established, and rescue centres created for animals that have been seized or injured (amounting to at least a dozen in the past two years); such areas could also function as breeding research centres.

d) Educational programmes must be developed that will actively include the people involved in the trade. These would be directed at tourists and involve the co-operation of, for example, the Customs agency at Tambo Quemado, at the Chilean border. Information relating to the Hairy Armadillo should also form part of a conservation awareness syllabus at schools.

e) Research must be undertaken into the species' reproduction and behaviour. Breeding centres dedicated to research into sustainable management and rational use of the Hairy Armadillo should be set up by providing an area where specimens can be captive-bred and harvested on a small-scale. The knowledge and skills acquired at breeding farms, which are co-ordinated and supervised by the DGB, should be passed on for the benefit of local people.

f) Systems should be installed to control the harvesting of wild populations and the consumption of animals raised on farms to ensure that they are traded legally and in a sustainable manner.

g) Sustainable wild-harvesting should be based on individual user-responsibility. For example, communities should take more responsibility for their activities by harvesting sustainably, establishing closed hunting seasons during the breeding season and prohibiting the capture of juvenile animals.

Bernardo Peredo/Bolivian Photo Agency

Considered to bring good luck to the owner, whole, stuffed armadillos can often be seen hanging up in shops. Sometimes the armadillo's ears may be decorated with coloured wool (above).

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Bernardo Peredo, Director of Tamandua, and Environmental Consultant for the Centre for the Development of Andean Communities, which works with local communities in Bolivia to conserve and manage natural resources in that country.

TRAFFIC NETWORK

TRAFFIC International
219c Huntingdon Road, Cambridge, CB3 0DL, UK
Tel: (44) 1223 277427; Fax: (44) 1223 277237; E-mail: traffic@trafficint.org
Web site: www.traffic.org

TRAFFIC East Asia
Regional Office Room 2001, Double Building, 22 Stanley Street, Central, Hong Kong
Tel: (852) 2530 0587; Fax: (852) 2530 0864; E-mail: tea@asiaonline.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: trafficj@twics.com
Web site: www/twics.com/~trafficj

Taipei Office PO Box 7-476, Taipei, Taiwan
Tel: (886) 2 2362 9787; Fax: (886) 2 2362 9799; E-mail: treatai@ms1.hinet.net
Web site: www.wow.org.tw

TRAFFIC East/Southern Africa
Regional Office c/o Department of National Parks and Wildlife
PO Box 30131, Lilongwe 3, Malawi
Tel: (265) 743645; Fax: (265) 743648; E-mail: traffic@malawi.net

Kenya Office PO Box 68200, Nairobi, Kenya
Tel: (254) 2 506839; Tel/Fax: (254) 2 600543; E-mail: traffic@iconnect.co.ke

South Africa Office c/o Endangered Wildlife Trust, Private Bag X11, Parkview 2122, South Africa
Tel: (27) 11 486 1102; Fax: (27) 11 486 1506; E-mail: trafficza@uskonet.com

Tanzania Office c/o WWF Programme Office, PO Box 63117, Dar es Salaam, Tanzania
Tel: (255) 51 700077/72455; Fax: (255) 51 75535; E-mail: traffictz@raha.com

TRAFFIC Europe
Regional Office Waterloosteenweg 608, 1050 Brussels, Belgium
Tel: (32) 2 343 82 58; Fax: (32) 2 343 25 65; E-mail: traffic@traffic-europe.com

France Office c/o WWF France, 188 rue de la Roquette, F75011 Paris, France
Tel: (33) 1 55 25 84 52; Fax: (33) 1 55 25 84 74

Germany Office c/o Umweltstiftung WWF Deutschland, Rebstoecker Str. 55, D 60326 Frankfurt (M), Germany
Tel: (49) 69 791440; Fax: (49) 69 617221; E-mail: melisch@wwf.de

Italy Office Via Garigliano 57, 00198 Rome, Italy
Tel: (39) 06 844971; Fax (39) 06 85300612; E-mail: traffic.italy@tiscalinet.it

Netherlands Office PO Box 7, 3700 AA Zeist, Netherlands
Tel: (31) 30 6937307; Fax: (31) 30 6912064; E-mail: jjonkman@wwfnet.org

Russia Office c/o WWF Russia Programme Office, Box 55, Moscow, Russia 125319
Tel/Fax: (7) 095 2649948; Fax: (7) 095 2649927; E-mail: vaisman@deol.ru
Web site: www/deol.ru/nature/protect

TRAFFIC India
c/o WWF-India Secretariat, 172-B Lodi Estate, New Delhi-110 003, India
Tel: (91) 11 4698578; Fax (91) 11 4626837; E-mail: trfindia@del3.vsnl.net.in

TRAFFIC North America
Regional Office 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, 245 Eglinton Avenue East, Suite 410, Toronto, Ontario M4P 3J1, Canada
Tel: (416) 489 4567; Fax: (416) 489 3611; E-mail: jthomson@wwfcanada.org

TRAFFIC Oceania
GPO Box 528, Sydney NSW 2001, Australia
Tel: (61) 2 9280 1671; Fax: (61) 2 9212 1794; E-mail: traffic@traffico.org

TRAFFIC South America
c/o IUCN Regional Office for South America, Av. Atahualpa 955 y República, Edificio Digicom 4to. piso, PO Box 17-17-626, Quito, Ecuador
Tel: (593) 2 466622; Fax: (593) 2 466624; E-mail: ximena@uicnsur.satnet.net

TRAFFIC Southeast Asia
Regional Office M19B 2nd Floor, Jalan Pasar (1/21), 46000 PJ Old Town, Petaling Jaya, Selangor, Malaysia
Tel: (60) 3 7917284; Fax: (60) 3 7947220; E-mail: tsea@po.jaring.my

Vietnam Office c/o WWF Indochina Programme Office, 7 Yet Kieu Street, International PO Box 151, Hanoi, Vietnam
Tel: (84) 4 8220640; Fax: (84) 4 8220642; E-mail: james@wwfvn.org.vn

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For further information contact:
The Executive Director
TRAFFIC International
219c Huntingdon Road
Cambridge CB3 0DL
United Kingdom
Telephone: (01223) 277427
Fax: (01223) 277237
Email: traffic@trafficint.org.uk