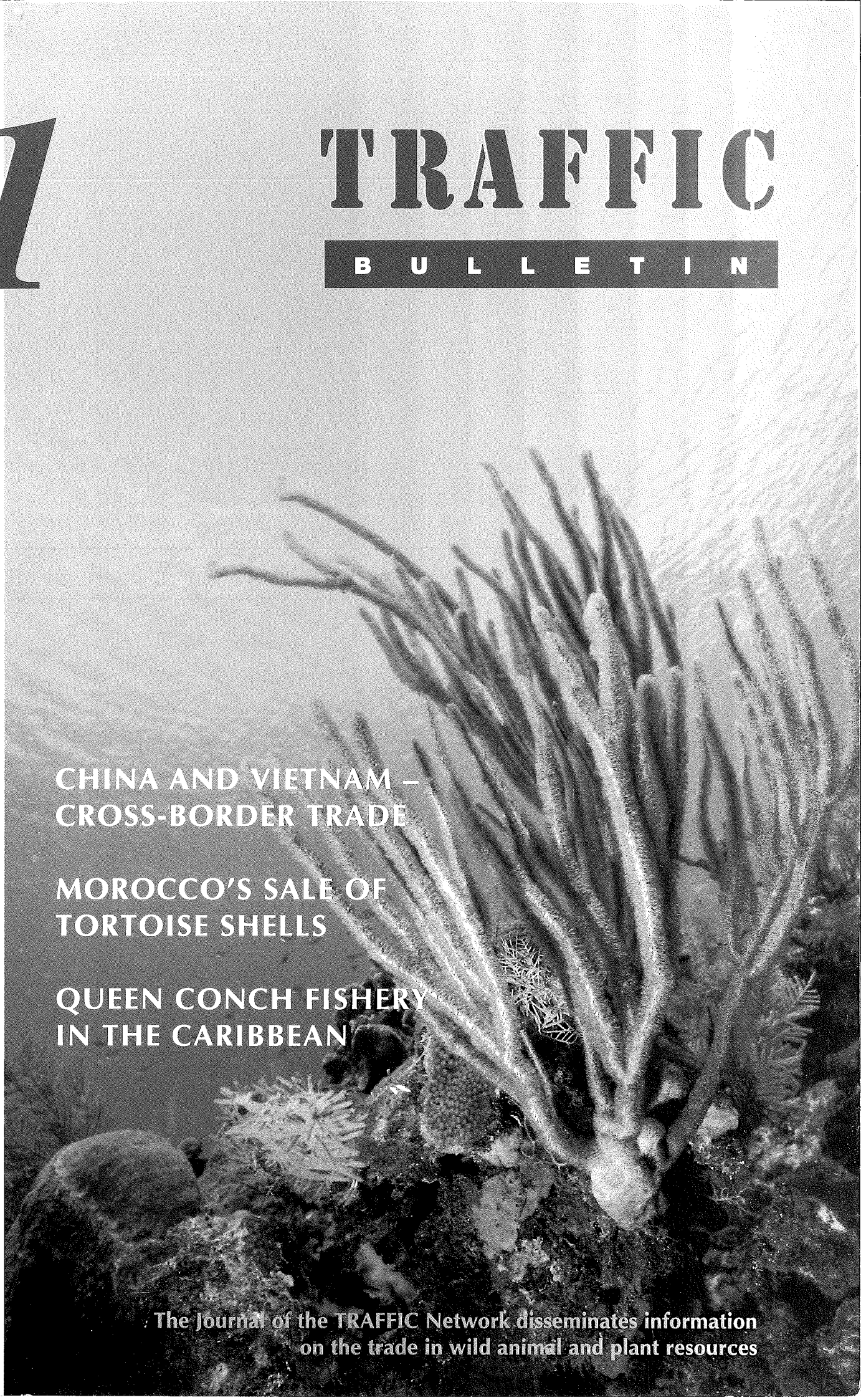
VOL. 16 NO. 1

# TRAFFIC BULLETIN



## CHINA AND VIETNAM – CROSS-BORDER TRADE

## MOROCCO'S SALE OF TORTOISE SHELLS

## QUEEN CONCH FISHERY IN THE CARIBBEAN

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

MARCH 1996

This *TRAFFIC Bulletin* is a publication of the TRAFFIC Network, a joint programme of WWF the 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 recent 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 in the *TRAFFIC Bulletin* 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



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



ISSN 0267-4297

TRAFFIC - Trade Records Analysis of Flora and Fauna in Commerce

Cover photograph: Caribbean Sea, Cayman Islands © WWF/Nancy Sefton

Printed on recycled paper by Foister & Jagg, Cambridge.

# TRAFFIC
## BULLETIN

VOL. 16 NO. 1



March 1996

## In and Out of TRAFFIC

### Staff Changes

Jorgen Thomsen, who served six years as the Executive Director of TRAFFIC International, left this post in December 1995 and has taken up a new position with Conservation International based in Washington, DC, USA. Jorgen's energy and leadership were of central importance to TRAFFIC's development in recent years, during which time the size and scope of the programme increased enormously. We wish Jorgen the very best of luck in his new position.

TRAFFIC is delighted to announce that Steven Broad has been appointed as the new Executive Director of TRAFFIC International. Steven's association with TRAFFIC began in 1983, when he began work at the Wildlife Trade Monitoring Unit (TRAFFIC's co-ordinating office at that time); after gaining experience on a wide range of research and investigations projects, Steven was appointed Assistant Director of TRAFFIC International in 1991. During 1994, he was Director of TRAFFIC Southeast Asia prior to his return to TRAFFIC International, in May 1995.

Arnold van Kreveld, TRAFFIC Europe's representative in the Netherlands for the past six years, has taken up the position of Forest Officer at WWF Netherlands; fortunately it is anticipated that Arnold will be in regular communication with the Network on forestry issues. A welcome to Jikkie Jonkman as Arnold's replacement.

After 10 years as Director of TRAFFIC USA, Ginette Hemley took up the position of Director of International Wildlife Policy at WWF-US, in 1995; she is still working closely with TRAFFIC, however. We are very pleased to announce the appointment of Gina de Ferrari as Ginette's successor. Prior to this appointment, Gina was a senior staff member on the US House of Representatives and responsible for matters related to wildlife trade, endangered species and other conservation issues. Andrea Gaski has been promoted to Director of Research at TRAFFIC USA.

Finally, following news in Vol. 15 No. 3 of the departure of Debra Callister from TRAFFIC Oceania, TRAFFIC is pleased to announce the appointment of Simon Habel as the new Director of that office. Simon leaves the Asia/Pacific programme of WWF-US and was previously employed by WWF Australia, where he worked closely on CITES issues with TRAFFIC Oceania staff at the time of the eighth meeting of the Conference of the Parties.

## US Concern over Japan's Whaling

On 11 December 1995, the USA certified that Japan has conducted research whaling activities that diminish the effectiveness of the International Whaling Commission (IWC). The certification, under the Pelly Amendment[1], is based on Japan's whaling activities in the North Pacific and waters of the Southern Ocean.

Japan expanded its research whaling activities into the North Pacific in 1994 by permitting the taking of 100 Minke Whales *Balaenoptera acutorostrata*; 21 were caught. The IWC found that these activities failed to satisfy applicable criteria for lethal research and was therefore inconsistent with the IWC's conservation programme. However, Japan continued its whaling activities in that region, taking 100 Minke Whales in 1995. In the same year, it also increased by 33% the number of Minke Whales to be harvested in the Southern Ocean, in an area designated a whale sanctuary at the 46th IWC meeting, in 1994.

Despite its certification of Japan, however, the USA has decided not to impose trade sanctions against that country. On 9 February 1996, President Clinton issued a statement which declared that the US Government believed that the use of trade sanctions was not the most constructive approach to resolving the two country's differences over whaling activities at this stage. The statement expressed "very strong concerns" over these operations, however, and stated that the Government will "vigorously pursue high-level efforts to persuade Japan to reduce the number of whales killed in its research programme" and hopes to "achieve significant progress on these issues by the beginning of the next Antarctic whaling season."

This is the third occasion that Japan has been certified under the Pelly Amendment for its whaling activities, the first time being in 1974, although trade sanctions have never been imposed. In 1988, the Pelly Amendment and the Packwood-Magnusson Amendment[2] to the *Magnusson Fishery Conservation and Management Act* were invoked, resulting in Japan's privileges to fish in US waters being removed. This prohibition remains in effect.

---

[1] *The Pelly Amendment of the US* Fishermen's Protective Act of 1967 *requires the US Secretary of Commerce to make a "certification" to the US President when he determines that the actions of nationals of another country are undermining the effectiveness of an international regulation to protect endangered species, even if such actions do not actually violate international or domestic law. The President has the option of imposing prohibitions on imports of products of that country, until the situation has been corrected.*

[2] *A country may be certified under the US Packwood-Magnusson Amendment to the* Magnusson Fishery Conservation and Management Act *if found to be conducting fishing operations which diminish the effectiveness of the International Convention for the Regulation of Whaling; such a certification may result in a reduction of allocation of fisheries quotas in US waters.*

*Hemley,* in litt., *19 December 1995; TRAFFIC USA; The White House, Press Release, 9 February 1996; USFWS Fact Sheet*

## Kumleben Commission Inquiry

The long-awaited report of the Kumleben Commission of inquiry into the alleged involvement of the South African Government in the illegal ivory and rhino horn trade was released in South Africa on 17 January 1996.

The Kumleben Commission, which was appointed on 7 October 1994, was charged with investigating and reporting on the alleged smuggling of ivory and rhino horn, particularly of Angolan and Mozambiquan origin, to and through South Africa; the alleged involvement of South African citizens in such smuggling activities; and the alleged illegal trade in ivory and rhino horn of South African origin. In addition, the Commission was asked to make recommendations which would lead to the elimination of such irregularities.

In carrying out the above-mentioned goals, the Commission requested some 140 individuals or organizations to provide evidence, which substantiated or refuted the many accusations which had been levelled at the South African Government and certain individuals. In addition to receiving written statements, the Commission held public hearings at which 23 witnesses, including the South African National Defence Force (SANDF), the Endangered Species Protection Unit (ESPU) of the South African Police Services and WWF South Africa, gave evidence.

The main findings of the Commission, as outlined in the report, are presented below:

- "During the period from 1975 to 1987, there was large-scale destruction of wildlife, including of elephants and rhinos, in Angola and north-eastern Namibia as a result of civil strife and "border war" in those two countries."

- "There are clear indications that most of the rhino horn and tusks thus obtained were exported via the RSA [Republic of South Africa] either as undisclosed contraband or with false or dishonestly obtained documentation."

- "Over this period the quantity of ivory imported by foreign countries from the RSA as recorded by them, vastly exceeded the amount of tusks originating in the RSA and Namibia taken with the official record of tusks imported into the RSA and Namibia. From this discrepancy one must conclude that the necessary permits for exportation issued in the RSA were either forged or granted on false information provided by the prospective exporters."

- "That officials of the Transvaal conservation department or other conservation personnel in the RSA were involved in such misconduct is not the only reasonable inference to be drawn from the evidence placed before the Commission or from its investigations into this question."

- "During the period from mid-1978 to about 1986 the Military Intelligence Division of the South African Defence Force (SADF) officially, though covertly, participated in the illicit possession and transportation of ivory and rhino horn from Angola and Namibia to the RSA. Initially, the SADF was directly involved and at a later stage collaborated with its "front company", Frama Inter-trading (Pty) Ltd, in continuing such illicit handling of ivory and rhino horn."

- "The allegations of similar activity on the part of the SADF to assist Renamo [National Resistance Movement of Mozambique] in Mozambique were not supported by any evidence placed before the Commission."

- "There are no grounds for believing that after 1986 the SADF, or its successor the SANDF [South African National Defence Force], has been engaged in smuggling ivory or rhino horn."

In addition to these findings, the Commission criticized several organizations for their activities or incompetence and the South African Department of Customs for its seriously flawed trade controls. On a positive note, the Commission found that the ESPU was operating effectively and conscientiously given their limited resources. However, the need for greater collaboration between the ESPU and other investigatory organizations was recommended. This collaboration was not seen to be restricted to South Africa, and the implementation of the Lusaka Agreement - to build law enforcement co-operation amongst southern African countries - was encouraged.

The Kumleben Commission Inquiry report is available for R18.15 from: The Government Printers-Publications, Private Bag X85, Pretoria 0001, South Africa.

*David Newton, South Africa National Representative, TRAFFIC East/Southern Africa*

## TRAFFIC Report on CITES Implementation in South Africa

TRAFFIC East/Southern Africa-South Africa has released a report on the subject of South Africa's implementation of CITES. The publication, *South Africa's Wildlife Trade at the Crossroads,* by Ashish Bodasing and Teresa A. Mulliken, highlights many of the weaknesses and deficiencies inherent in that country's wildlife trade management policies, administration and legislation. It cites examples of wildlife trade infringements, and reveals that Government conservation authorities are sometimes unwitting partners in the illegal wildlife trade owing to weak and fragmented legislation, poor administrative infrastructure and lack of co-operation between some government law enforcement authorities. Specific recommendations are made on how the South African Government can improve its implementation of wildlife trade regulations, in general, and CITES management, in particular.

A few copies of the report are available for US$30 from TRAFFIC East/Southern Africa-South Africa, c/o Endangered Wildlife Trust, Private Bag X11, Parkview 2122, South Africa.

*David Newton, South Africa National Representative, TRAFFIC East/Southern Africa*

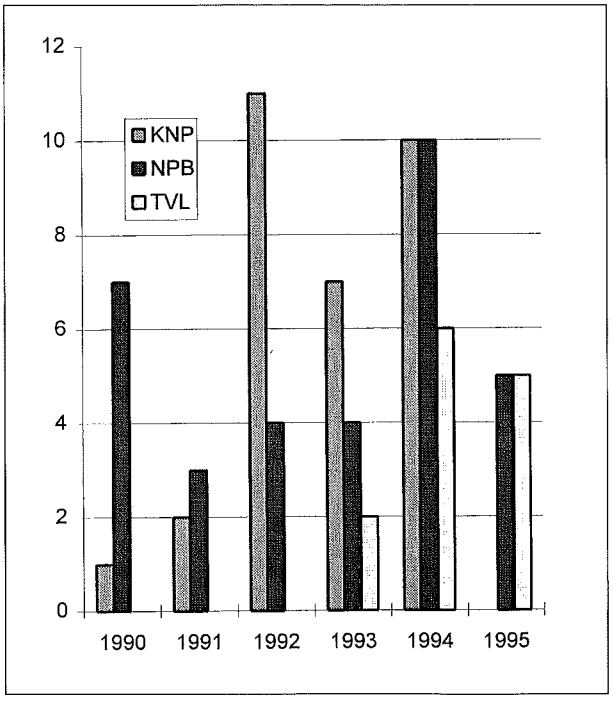
## Poaching Figures for South Africa's Rhinos

In South Africa between 1990 and late 1995, six Black Rhinos *Diceros bicornis* and 27 White Rhinos *Ceratotherium simum* were lost to poachers in areas managed by the Natal Parks Board (Hluhluwe, Itala, Mkuzi, Umfolozi Game Reserves and Spioenkop Public Resort); of the 66 horns to be accounted for (two per animal), a total of 26 were either recovered, had not been removed from the animals, or had been lost by natural causes. Estimating an average weight of 3.5 kg per horn, some 140 kg of rhino horn remain unaccounted for. In a few of the poaching incidents, small pieces of skin had been removed from the dead animals.

A total of 32 rhinos were poached during the same period in Kruger National Park, and 13 in the Transvaal region. The figures for the three regions represent a total of 71 White Rhinos and 7 Black Rhinos.

South Africa has not conducted a programme of dehorning its rhino population.

*Natal Parks Board,* in litt. *to TRAFFIC International, 27 December 1995*




**Figures for rhinos poached in areas under the jurisdiction of the Natal Parks Board, Kruger National Park and the Transvaal, South Africa, 1990-1995.**

## Rhino Recovery in Nepal

The involvement of local people in conservation efforts in Royal Chitwan National Park, Nepal, has contributed to a recovery of the park's rhino population. Numbering between 40 and 60 when the park was established in 1973, its population of Indian Rhinos *Rhinoceros unicornis* has swollen to nearly 500. The increase in numbers has allowed for 38 animals to be translocated to the Royal Bardia National Park, 150 km away, in order to establish a new population there.

The Department of National Parks and Wildlife Conservation (DNPWC) and WWF together have been working to protect Chitwan's rhino population since 1967; six years later the park was patrolled by the Nepalese Army but increasingly sophisticated poaching methods led DNPWC, in 1990, to devise a system that deployed small, highly mobile anti-poaching teams using recruits from local communities. Chitwan's Bengal Tiger *Panthera tigris* population has also seen an increase in numbers - from an estimated 60 in 1990 to over 100 in 1995.

*WWF News Release, 14 December 1995*

## African Elephant Export Quotas

Trophy hunting quotas for 1996 for the African Elephant *Loxodonta africana* have been communicated to the CITES Secretariat by the following countries (in accordance with Resolution Conf. 9.16):

| | |
|---|---|
| Botswana | 80 elephants or 160 tusks |
| Cameroon | 80 elephants or 160 tusks |
| Namibia | 75 elephants or 150 tusks |
| South Africa | 43 elephants or 86 tusks |
| Tanzania | 50 elephants or 100 tusks |
| Zimbabwe | 300 elephants or 600 tusks |

CITES Parties may only accept raw ivory that is clearly marked by means of punch-dyes or indelible ink at the 'lip-mark' of the tusk. Each identification mark should include the two-letter ISO code of the country of origin, a serial number for the tusk/the last two digits of the year, and the weight of the tusk in kilogrammes (eg. KE 127/94 14).

*CITES Secretariat Notification to the Parties No. 896, 4 January 1996; TRAFFIC Europe*

## Wildlife Trade Symposia

An opportunity to bring together traditional Chinese medicine (TCM) specialists from China, Hong Kong, Singapore, Japan and South Korea to discuss the role of the TCM community in wildlife conservation was recently provided when TRAFFIC East Asia and the Agriculture and Fisheries Department of Hong Kong co-hosted the International Symposium on Traditional Chinese Medicine and Wildlife Conservation, on 31 October 1995, in Hong Kong.

Given the large numbers of people who depend upon TCM for their health care, the purpose of the event was to establish constructive dialogue with TCM practitioners, traders and consumers, in efforts to ensure that demand for TCM medicine can be satisfied without harming wildlife populations. TCM delegates were asked to suggest public awareness activities that WWF and other international conservation groups might undertake to dissuade the unsustainable use of wildlife in TCM. A small group of international observers, including the Deputy Secretary General of the CITES Secretariat, attended in order to learn more about the ideas and opinions of TCM specialists. Simultaneous interpretation in Cantonese, Mandarin and English was provided to ensure clear communication and understanding among the various nationalities present.

Proceedings of the symposium will be available, in Chinese and English, by the end of June 1996. Details of their availability can be obtained from TRAFFIC East Asia, c/o WWF Hong Kong, 1 Tramway Path, GPO Box 12721, Central, Hong Kong.

---

The Second International Symposium on the Trade of Bear Parts will be held in Seattle, Washington, USA, on 26 to 28 July 1996.

Presenters and participants from around the world will gather to discuss the global trade of North American bears, the types of bear use and the public perception of this trade. The event will provide an opportunity to examine the effectiveness of regulatory, legislative and law enforcement efforts to control the trade, as well as exploring Native American wildlife rights in relation to the trade.

The symposium will be co-sponsored and financed by TRAFFIC USA, WWF US, the IUCN/SSC Bear Specialist Group, and the Woodland Park Zoo.

*TRAFFIC USA*

© WWF/Eric Dragesco

**Elk *Cervus elaphus***

## Elk Antlers Harvested for TCM

The province of Manitoba, Canada, is to legalize the harvest of Elk *Cervus elaphus* antlers. Operators will be permitted to crop and sell the antlers, which are prized in traditional Chinese medicines (TCM).

Although shed deer Cervidae antlers have some medicinal value in TCM, it is the velvety covering of the newly formed antler that is particularly valued as a tonic and to relieve impotence. It is also taken as a remedy for weak joints, particularly in children, and to treat ulcerations and other blood-related disorders. The velvet is removed from live cervids before calcification, or hardening, of the antler occurs, as this is considered to lower the quality and therefore the value of the antler.

The Manitoba ranching scheme is expected to become operational in the autumn of this year. According to the province's Department of Natural Resources, Manitoba's wildlife laws are among the most stringent in Canada and the operations will be tightly regulated and humanely conducted.

*TRAFFIC USA; R. Carmichael, Chief, Game and Fur Management, Wildlife Branch, Department of Natural Resources, Winnipeg, Manitoba,* in litt., *29 January 1996*

## Irish Box Opens Up to Iberian Fleets

The Fisheries Council of the European Union (EU) met in Luxembourg on 26 October 1995 to agree new measures to monitor and control fishing in waters which extend from the northern tip of Scotland to northwestern Spain (known as Western waters). These measures came into effect on 1 January 1996, when Iberian fishermen were granted greater access to these waters, under the terms of Spain and Portugal's membership of the EU. The two countries were excluded from some European fishing grounds when they joined the EU in 1986 because of concern over their large fishing fleets. The new strategy agreed in Luxembourg is designed to prevent any overall increase in fishing, despite the addition of Spanish and Portuguese trawlers in Western waters; the Iberian fleet will be restricted to their existing quotas and will have no access to the Irish Sea or the upper part of the Bristol Channel, nor inside the 12-nautical-mile limit of any other part of the UK and Irish waters. Fishery protection vessels and Government surveillance aircraft will keep Western waters under constant watch to ensure that the new arrangements for regulating fishing effort are respected. Fishing boats operating illegally face fines of up to £50 000 (US$80 000) for each offence. The UK's stance at the Council meeting in Luxembourg was also designed to avoid excessive regulation of its own fishing industry. New fishing regulations which cover the "Irish Box", an area in Western waters that has been opened up to Spanish and Portuguese fleets, have been branded incomprehensible by the UK's fishing industry. The 28-page document, issued in late December 1995, is reported to be so complex that fishermen are threatening to ignore them.

*MAFF News Releases, 31 October;22/31 December 1995; 22 January; The Independent (UK), 20 December 1995; Financial Times (UK), 27 October 1995/6 January 1996*

## Tightening the Net on Quotas

In late December, the UK Government's efforts to garner support for European Commission proposals to significantly reduce fishing quotas in 1996, were narrowly defeated in the House of Commons - with 299 to 297 votes against such proposals. Despite this opposition, the EU Fisheries Council, meeting the following day, agreed to reduce quotas for some 28 fish stocks; quotas for a number of species were still higher than had been proposed at the start of negotiations, however, and the total catch represents an increase worth over £30 million (US$45m) to the UK industry at 1995 market prices.

Quotas for stocks in the waters of north Norway, Faroe Islands, Greenland (all non-EU Member States) and areas covered by NAFO (Northwest Atlantic Fisheries Organization), have been retained at the same levels as those set for 1995.

Ministers have voted to continue the provision of Community financial assistance to Member States for fisheries enforcement. The financial aid includes special assistance for Ireland in recognition of the exceptional demands and costs involved in undertaking enforcement in the waters of the Republic of Ireland.

*MAFF News Release, 22 December 1995*

## Juvenile Fish Off the Hook

In an effort to improve measures designed to conserve fish, the UK Government has set up a Fisheries Conservation Group which comprises members of the fishing industry, scientists and Government experts. The group will be looking at ways to reduce catch of juvenile or non-targeted fish by use of more selective catching methods and improvement both in mesh sizes of nets and minimum landing sizes for fish. Members will depend upon the practical expertise of fishermen in demersal, pelagic and shellfish fisheries, and draw on the scientific expertise of the Fisheries Departments and the Sea Fish Industry Authority. It is expected that the Fisheries Conservation Group will have a central role to play in developing the UK's input to the European Commission's discussions on these issues.

*MAFF News Release, 7 December 1995; 8 February 1996*

## Fish and Ships

The UK fishing fleet landed 875 000 t of fish, including shellfish, during 1994, a quantity valued at £561 million (US$898m). The amount of fish landed was greater than during 1993, by two percent, while the average price per tonne of fish, on landing, increased by five percent over the same period.

The number of vessels over 10 m has declined by 10% to 3220 since 1993.

UK sea fisheries statistics are published annually by Her Majesty's Stationery Office (HMSO) in the UK.

*MAFF News Release, 6 October 1995*

## Bowing Out

The three-year programme of decommissioning fishing vessels (*TRAFFIC Bulletin* 15(2):56), put into practice by the UK Government in 1993 has completed its third round (that of 1995), during which 164 vessels were decommissioned. With these reductions, the UK fleet will have been reduced by seven percent since 1993.

*MAFF News Release, 24 October 1995*

## Southern Bluefin Tuna Quota Negotiations Flounder

Australia and New Zealand - two of the signatories to the Convention for Conservation of Southern Bluefin Tuna (CCSBT) - have volunteered to freeze their 1995-1996 quotas for Southern Bluefin Tuna *Thunnus maccoyii* at last year's levels, in an effort to help ensure a long-term sustainable industry for this heavily overfished species. Japan, the third CCSBT signatory, has been unable to commit to a similar restriction of its quota allocation, however.

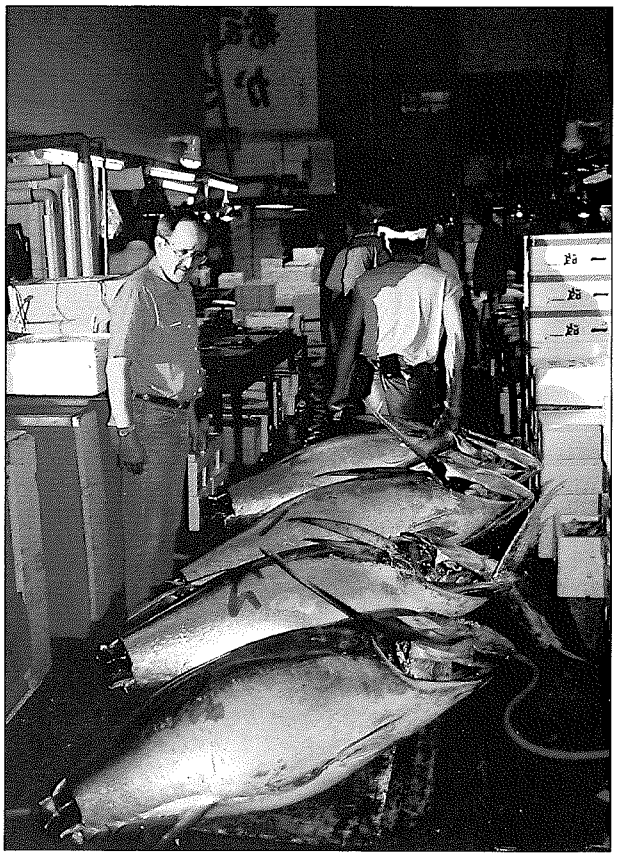
The three countries - which are the main countries fishing for Southern Bluefin Tuna - convened a special meeting in Canberra on 17-19 January 1996 to negotiate a Total Allowable Catch (TAC) for the global Southern Bluefin Tuna catch (currently 11 750 t per year), after failing to reach agreement at an earlier meeting in December 1995 on a quota break-up between the countries. The impasse stems from differences of view between Japan and Australia/New Zealand as to the status of the Southern Bluefin Tuna stock and its capacity to withstand catch increases.

Based on scientific evidence presented by the Australian delegation to a scientific meeting of the CCSBT, in September 1995, it is estimated by TRAFFIC that there is a need for a 25% reduction in the current TAC. This is considered essential if the CCSBT is to meet its goal to ensure a biologically secure parental stock by the year 2020, i.e. a return of the parental stock to at least 1980 levels, three times larger than it is currently.

This season's quota for Australia and New Zealand will remain at 5265 t and 420 t, respectively. Japan has pressed for an increase of up to 6000 t above last year's global TAC of 11 750 t, or a special allocation of up to 6000 t on top of last year's quota, for an experimental fishing programme to address uncertainties regarding the abundance of fish in areas currently unfished.

Glenn Sant, Acting Director of TRAFFIC Oceania, has been participating at the meetings of the Scientific Committee to the CCSBT and the Commission to the CCSBT, as a non-government member of the Australian official delegation.

*TRAFFIC Oceania; Media Release, David Beddall, Minister for Resources, Australia, 25 January 1996*





**Fresh/chilled tuna on the auction floor. These fish will be filleted into thin pieces and served raw - a popular Japanese dish known as 'sashimi'.**

## Seminal Work

Female Siberian Sturgeon *Acipenser baeri* are being artificially inseminated as part of a test run to establish a breeding programme for their western European relatives Atlantic Sturgeon *Acipenser sturio*. The latter species is listed in CITES Appendix I, having been depleted excessively for the caviar trade, and survives only in the Gironde estuary of France. This population of sturgeon is so fragile that scientists at the National Centre for Agriculture and Forestry, Engineering and Water Management (CEMAGRAF) in Bordeaux are reluctant to subject it to any experimentation, hence the involvement of the Siberian fish. CEMAGRAF is collaborating with scientists from the Institute for Cryobiology and Cryomedicine in Kharkov, Ukraine, and the Institute for Developmental Biology in Moscow to optimize success in impregnating the sturgeon with sperm that has been frozen. Rates of success are so far poorer than when fresh sperm is used, but as many as 62% of female sturgeon have been impregnated using sperm which has been frozen very rapidly.

Reliance on natural incidence of fertilization to ensure the future of the Atlantic Sturgeon is thought to be too risky, since no more than 10 of the fish may be present in the spawning area of southwestern France at any one time.

*New Scientist, 27 May 1995*

## Africa's Horn of Plenty

The warm waters of the Red Sea, off Eritrea, offer fishermen a promising alternative to the overfished waters of the Mediterranean. This area of Africa's coastline is reported to hold up to 1000 fish species, virtually untouched since the 1950s when, according to Eritrea's Minister for Marine Resources, Israeli companies were exporting 25 000 t of fish a year. "At the time, they estimated a possible yield of 50 000 t to 55 000 t" says Mr Saleh Meky. "Now we're assuming we could export 80 000 t."

The Eritrean Government still needs to evaluate its stocks and suffers from a shortage of fishing vessels, cold storage, processing and transport facilities vital to the industry. Meanwhile, British, Saudi, Greek, Dutch and Israeli companies are already operating in these waters.

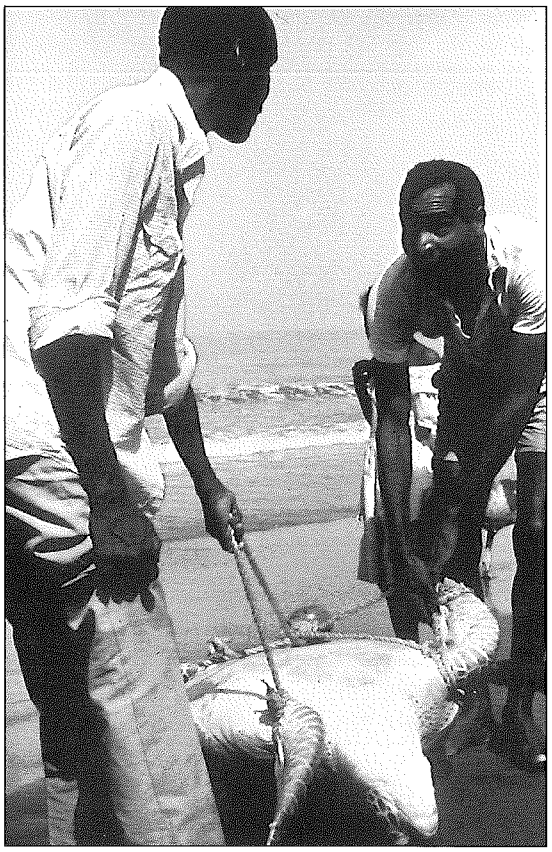
*Financial Times (UK), 10 January 1996*

## Indelicate Harvest of a Delicacy

Up to a tonne of Date Mussels *Lithophaga lithophaga* is sold daily in Slovenia for consumption as a delicacy. The shellfish are found in Adriatic coastal waters inside rocks and coralline structures into which they bore. To extract the mussels, rocks must be broken up and it has been estimated that it is necessary to excavate 14 $m^2$ of rock in order to extract 25 kg of mussels. Not surprisingly, Date Mussels are much more expensive than other mussels used culinarily. Exploited areas are clearly visible from the air as lighter patches on the sea bed. Such devastation not only drives Date Mussels from their habitat, but also many other marine organisms, which may take years to re-colonize the site. It takes at least five years for Date Mussel larvae to settle on the new surface, but 10 to 20 years for the individuals to grow to five centimetres in length. The mussels can eventually reach 10 cm and some may live for 80 years.

The Date Mussel is not an endangered species. However, owing to associated destruction, collection of this bivalve is illegal in some Mediterranean countries, however, including Italy, although intense illegal fishing for specimens continues to occur there. Until recently, Italy allowed imported Date Mussels to be sold in restaurants, and many of these are thought to have originated in the Croatian Adriatic. Since the beginning of 1995, however, collection and sale in Croatia has been illegal, too. Nevertheless, harvesting continues in the region, the majority of specimens smuggled into neighbouring Slovenia, while Date Mussels from Croatia are still on the menu in Italy.

*Dr R. Sekulic, "Threatened Planet",* in litt., *17 July 1995; TRAFFIC Europe*



© WWF-US

## Sea Turtle Products A Burning Issue in Zanzibar

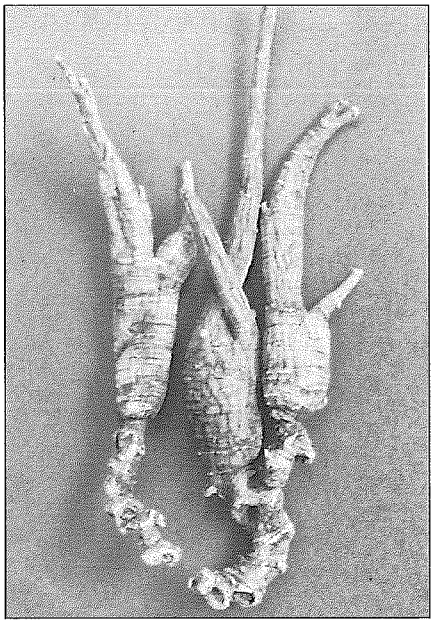
Souvenirs made from sea turtle products have been destroyed by the Government of Zanzibar, Tanzania, in an effort to eliminate a trade that is escalating as the number of tourists to the island grows.

The 500 products had been purchased from curio shops by the Department of the Environment in exchange for items, including T-shirts bearing the slogan "Conserve Turtle Products". The items were destroyed at a ceremonial fire attended by senior Government officials at Beit-el-Ras.

The destruction of these goods forms part of a turtle protection campaign launched on the island two years ago which also includes a community-based education programme. Turtle meat has also been confiscated.

Turtles most commonly found in Zanzibar's waters are the Hawksbill *Eretmochelys imbricata*, Green *Chelonia mydas*, Leatherback *Dermochelys coriacea* and Olive Ridley *Lepidochelys olivacea*.

*The Express (Zanzibar), 31 August-2 September 1995*




**Root of American Ginseng *Panax quinquefolius***

## Growing Appeal of Ginseng

Such is the demand for wild ginseng by collectors in Virginia, USA, that some farmers growing the plant have taken to sleeping in their fields, armed with guns, to deter poachers.

Ginseng *Panax* spp. is a herb that grows in the wild primarily in the USA, China and Korea, where it is generally classified as rare or threatened. The plant's root is highly regarded by users of traditional Chinese medicines, who consider its properties alleviate the symptoms of a range of disorders, as well as tonifying the lungs and stomach and strengthening the spleen and heart. It is processed into tablets, teas, extract, creams and other products, and the stem and leaf of the plant are also used medicinally.

American Ginseng *Panax quinquefolius,* which is listed in CITES Appendix II, is widely cultivated in the USA; however, it is the wild-grown specimens, and so-called wild-simulated ginseng (wild plants growing in areas that are slightly tended, to remove weeds, for example), that are so highly sought after. Federal law permits harvesting of wild ginseng from 15 August to 31 December; those hunting the plant have found it increasingly difficult to locate, however. The plant takes six years to mature but the young specimens are being harvested before they have scattered their seeds. In Virginia, the country's fifth-largest producer of wild-collected ginseng, it is estimated that up to 25% of the wild plants are being removed before they reach seed-bearing age. Some property owners are reported to have installed security cameras to deter unauthorized removal of plants from their land, but it is believed that theft is underreported because owners fear divulging the fact that ginseng is growing on their land.

*The Washington Post (USA), 11 December 1995; Prescription for Extinction: Endangered Species and Patented Oriental Medicines in Trade, Gaski, A.L and Johnson, K.A. (1994), TRAFFIC USA.*

## Buyers Urged to Look Beneath Veneer

The Tropical Forest Foundation (TFF), a US non-profit educational organization comprising a coalition of representatives from industry and the scientific and conservation communities, has produced a leaflet *Model Specifications for Architects and Designers* to encourage buyers to use timber suppliers that provide the best available information on the environmental quality of their wood sources. The pamphlet offers guidelines in the form of a range of questions for buyers to ask suppliers before a contract is awarded. Buyers are also urged to consider including written specifications for all jobs that include veneer and finished lumber; these should require that timber products are from sources adopting the best practices in forest management, logging, and processing. It recommends that information on those practices be supplied to the architect who may reject bids for which acceptable information is not submitted. The contractor should also be required to document the country of origin of all wood veneers and inform the architect if that country is not a member of ITTO or if the species is listed in CITES.

The Foundation is currently engaged in a project in the Brazilian Amazon that aims to improve natural forest management by promoting the use of low-impact logging (LIL) practices. The Brazilian Amazon contains about one third of the world's tropical forests, consisting of many different types of forest. The project will establish up to eight models that are tailored to specific forest types and industrial sector demands that exist in these regions. The programme was initiated in 1994, and already two models are underway - one in upland forest near Paragominas, Para, where more than 80 timber species are harvested, and the second in upland forest near Portel, where fewer than 30 species are used. A third, focusing on Big-leafed Mahogany *Swietenia macrophylla,* will soon be established in southern Para - the region in the Brazilian Amazon from where most mahogany is extracted.

*Tropical Forest Foundation (TFF)*

# A Survey of Wildlife Trade in Guangxi and Guangdong, China

*Li Wenjun, Todd K. Fuller and Wang Sung*

*The incidence of wildlife in trade in southern China has increased significantly following the growth in the country's economy and an expanding human population. In 1994, the authors carried out a survey of the trade in Guangdong Province and Guangxi Zhuang Nationality Autonomous Region, and areas along the border with Vietnam. Their findings indicate that, although some achievements have been made in regulating the trade, more vigorous implementation of wildlife legislation is urgently required. As a minimum, increased financial resources and training must be provided to wildlife officials in both China and Vietnam if trade control mechanisms in the region are to be strengthened.*

## Introduction

The rapid economic growth of southern China since the early 1980s has resulted in a steady increase in living standards, one result of which has been growth in the use of Chinese traditional food and traditional medicine. These changes have led to unprecedented demands for wildlife products, and the high value of these items has stimulated internal wildlife trade in southern China and cross-border trade with Vietnam. Apart from a study by Lau *et al.,* (1995) and anecdotal accounts of these practices, little effort has been made to identify the status of wildlife trade in southern China. In order to examine the trade and identify any deficiencies in the management of the region's wildlife resources, the authors conducted a short-term trade survey in Guangdong Province and Guangxi Zhuang Nationality Autonomous Region, in the south of the country, from June through August 1994. The investigation covered black market, cross-border trade, sale of wildlife in local markets and cities, consumption of protected wildlife by restaurants, as well as the release of confiscated wildlife which had been reported to be poorly managed. Official documentation of trade records and confiscations since 1990 were also consulted. Preliminary results of this survey are presented below. Further surveys of these regions will be carried out and a detailed report is in preparation (Li and Li, in prep.). Surveys of Government-regulated outlets have been carried out previously but these findings have not been published (W. Sung, pers. comm. 1995).

## Background

Guangdong Province and Guangxi Zhuang Nationality Autonomous Region are situated in the south of China, in the subtropical or northern tropical region (Figure 1), an area rich in flora and fauna (Chen *et al.,* 1994). Guangdong is a major distribution centre for goods as well as a channel for the import and export of items to south and southwest China. The province borders Fujian and Jiangxi Provinces in the north, Guangxi Province in the west, Hunan Province in the northwest and its eastern and southern coast is close to Hong Kong, Macao and Hainan Island. It was one of the first provinces to open up to the west (Chen Shu, pers. comm., 1994) and thus its economy, boosted by overseas business, is more prosperous than in neighbouring regions. The practice of using traditional medicine and the well-developed culinary tradition of Guangdong, both of which make use of the local plants and animals, the rapid development of the local economy

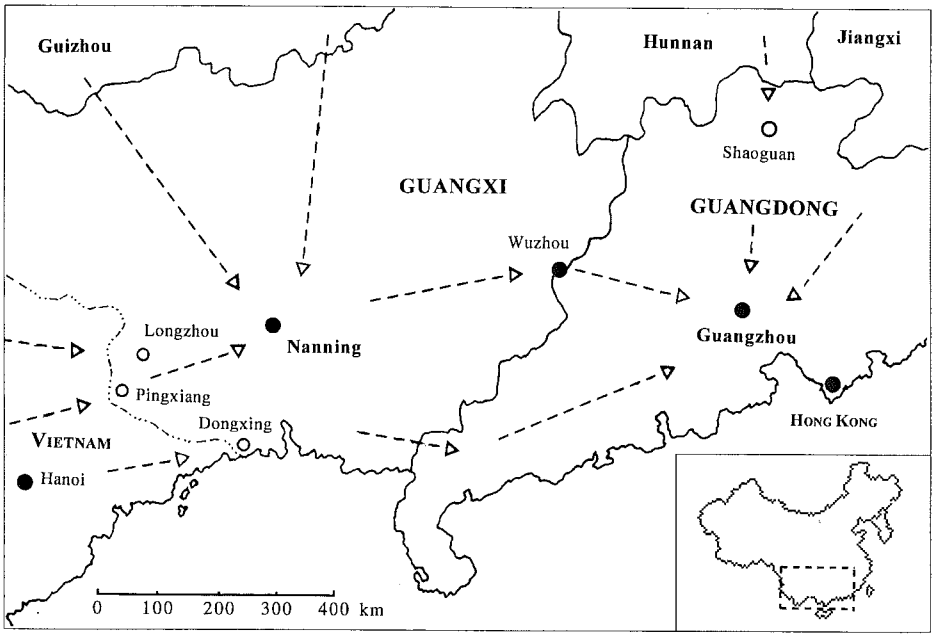
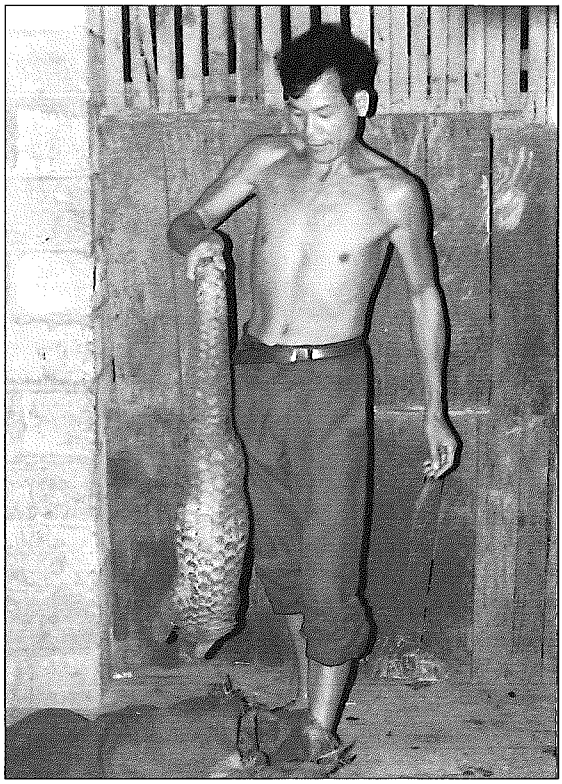



**Figure 1. Main areas surveyed in Guangxi Zhuang Nationality Autonomous Region and Guangdong Province, China.**

**Arrows indicate possible routes used in the transportation of wildlife.**

and a large expanding human population, have placed great demands on the region's wildlife. As a consequence, animals and plants and related products are imported in large quantities from neighbouring provinces and from Vietnam.

Guangxi is situated along the southeastern edge of the Yunnan-Guizhou highlands, bordering Vietnam. Although Guangxi's economy is much less developed than that of Guangdong, the region is regarded as one of the country's richest in terms of its biodiversity (Chen *et al.*, 1994) and has the highest number of nature reserves in China. Guangxi is an autonomous region and a large proportion of its population consists of minorities who have traditionally harvested wildlife for food or medicines. Demands for wildlife in Guangdong have been major stimulating factors in the poaching and illegal wildlife trade in Guangxi. According to verbal accounts of wildlife officers from Guangxi, the region is also believed to be a major channel for the transportation of wildlife from Vietnam and southwest China (Yunnan, Guizhou and Sichuan) to Guangdong.



© Li Wenjun

**A consignment of Chinese Pangolins *Manis pentadactyla* illegally imported from Vietnam to Nongrao, a frontier trade site in Pingxiang City, Guangxi Autonomous Region, China.**

## Methods

During June to August 1994, one of the authors visited nine major free trade markets (where the sale of species and prices are largely not regulated by the Government), five trade sites on the border with Vietnam (Friendship, Puzai and Nongrao in Pingxiang City and Shuikou in Longzhou County and Dongxing in Fangchengang City, Guangxi), three national nature reserves (Chebaling, Nanling and Nonggang), five local forestry bureaux in Guangdong and Guangxi, and the Guangdong and Guangxi Provincial (Regional) Departments of Forestry. The species appearing in the markets and their relative abundance were recorded. Market management officials, police officers, park rangers, forestry protection officials, wildlife brokers, customers, hotel and restaurant managers were interviewed, and documentation on wildlife trade, confiscations and poaching activities held by local wildlife authorities was consulted. Species 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.

## Legislation

Various trade control laws and regulations have been in force in China for some time. Penalties for poaching and illegal trade have been stringent (including sentences to life imprisonment and the death penalty). According to the *Wildlife Protection Law of the People's Republic of China (1988)*, a permit must first be obtained before an animal may be captured, transported and sold. Permits for non-protected species are issued by the local county or prefecture wildlife authorities. Species classified as being in need of some measure of protection within China are listed in Classes I and II: permits to cover 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 should be purchased and registered. In 1981, China acceded to CITES.

The enforcement of legislation for the protection of wildlife in Vietnam is limited. *Instructions of the Prime Minister Regarding the Management and Protection of Rare and Precious Flora and Fauna in Vietnam* were promulgated in 1993 in an effort to reduce and control wildlife trade and to reiterate Decree No. 18, issued in 1992, which prohibits or restricts the sale or export of 60 animals and some 40 plant species. Further, the *Instructions* direct relevant authorities to "place maximum restrictions on the exploitation for sale of all animals used in specialty dishes such as snakes, turtles, crabs, frogs and other flora and fauna which even though neither rare nor precious are in danger of depletion..." This appears to mean that unless an unprotected species is consumed, there is no possible limit to capture and/or utilization (Le Dien Duc *et al.*, 1993). Vietnam became a Party to CITES in 1994 but implementing legislation has not been enacted.

| | Guangdong | | Guangxi | | | Legal |
|---|---|---|---|---|---|---|
| | Market | FRecord | Market | FRecord | FTrade | Status |
| **MAMMALIA** | | | | | | |
| Stump-tailed Macaque *Macaca arctoides* | + | + | ++ | ++ | +++++ | 2,II |
| Assam Macaque *Macaca assamensis* | + | + | +++ | +++ | +++ | 1,II |
| Crab-eating Macaque *Macaca fascicularis* | + | + | ++ | ++ | +++++ | II |
| Rhesus Macaque *Macaca mulatta* | ++ | ++ | +++ | +++ | +++++ | 2,II |
| Pigtail Macaque *Macaca nemestrinus* | ++ | + | +++ | +++ | +++ | 1,II |
| François' Leaf Monkey *Trachypithecus francoisi* | | + | ++ | + | + | 1,II |
| Slow Loris *Nycticebus coucang* | + | | +++ | +++ | +++++ | 1,II |
| Leopard Cat *Prionailurus bengalensis* | ++ | | + | + | | GX,II |
| Crab-eating Mongoose *Herpestes urva* | + | | ++ | + | + | GX |
| Badger *Meles meles* | + | | + | | | |
| Chinese Ferret Badger *Melogale moschata* | + | | + | | | |
| Siberian Weasel *Mustela sibirica* | + | | ++ | | | GX |
| Asiatic Black Bear *Ursus thibetanus* | + | | + | + | | 2,I |
| Brown Bear *Ursus arctos* | + | | + | + | | 2,I |
| Owston's Palm Civet *Chrotogale owstoni* | + | | ++ | ++ | + | |
| Masked Palm Civet *Paguma larvata* | +++ | +++ | +++ | +++ | + | GX |
| Spotted Linsang *Prionodon pardicolor* | ++ | | +++ | +++ | ++ | 2,I |
| Large Indian Civet *Viverra zibetha* | ++ | ++ | +++ | +++ | ++ | 2 |
| Small Indian Civet *Viverricula indica* | ++ | ++ | ++ | ++ | | 2 |
| Wild Pig *Sus scrofa* | + | | + | | | |
| Red Deer *Cervus elaphus* | +++ | | +++ | | | 2 |
| Sika Deer *Cervus nippon* | ++ | | ++ | | | 1 |
| Sambar *Cervus unicolor* | +++ | | +++ | | ++++ | 2 |
| Indian Muntjak *Muntiacus muntjak* | +++ | | +++ | | | |
| Chinese Muntjak *Muntiacus reevesi* | +++ | | +++ | | | |
| Saiga Antelope *Saiga tatarica* | + | | + | | | 1,II |
| Chinese Pangolin *Manis pentadactyla* | ++ | +++ | +++ | +++ | +++++ | 2,II |
| Chinese Hare *Lepus sinensis* | +++ | | +++ | | | |
| Malayan Porcupine *Hystrix brachyura* | + | + | + | + | | GX |
| Giant Mountain Rat *Niviventer coxingi* | ++ | | +++ | ++ | ++ | |
| Chinese Bamboo Rat *Rhizomys sinensis* | +++ | + | +++ | ++ | | GX |
| Black Giant Squirrel *Ratufa bicolor* | ++ | | +++ | ++ | ++ | 2,II |
| **AVES** | | | | | | |
| Mandarin Duck *Aix galericulata* | ++ | | ++ | + | + | 2 |
| Ducks *Anas* spp. | +++ | | +++ | +++ | +++ | II |
| Hawks *Accipiter* spp. | ++ | +++ | + | ++ | ++ | 2,II |
| Eagles *Aquila* spp. | + | | + | | + | 2,II |
| Black Kite *Milvus migrans* | + | | ++ | ++ | ++ | 2,II |
| Falcons *Falco* spp. | ++ | | + | | + | 2,II |
| Long-eared Owl *Asio otus* | ++ | +++ | ++ | ++ | ++ | 2,II |
| Eurasian Eagle-Owl *Bubo bubo* | ++ | + | ++ | ++ | + | 2,II |
| Asian Barred Owlet *Glaucidium cuculoides* | ++ | ++ | + | | | 2,II |
| Eurasian Pygmy-Owl *Glaucidium passerinum* | ++ | ++ | + | | | 2,II |
| Sichuan Partridge *Arborophila rufipectus* | + | | + | | | 1 |
| Mountain Bamboo-Partridge *Bambusicola fytchii* | + | ++ | ++ | ++ | | |
| Chinese Bamboo-Partridge *Bambusicola thoracica* | + | ++ | ++ | ++ | | |
| Golden Pheasant *Chrysolophus pictus* | ++ | + | + | | | 2 |
| Silver Pheasant *Lophura nycthemera* | ++ | +++ | + | ++ | | 2 |
| Scarlet Minivet *Pericrocotus flammeus* | ++ | | + | | | GX |
| Long-tailed Broadbill *Psarisomus dalhousiae* | + | | ++ | | +++ | 2 |
| Silver-breasted Broadbill *Serilophus lunatus* | ++ | | ++ | | ++ | |
| Hwamei *Garrulax canorus* | +++ | | +++ | | | GX |
| White-browed Laughingthrush *Garrulax sannio* | ++ | | ++ | | | GX |
| Silver-eared Mesia *Leiothrix argentauris* | ++ | | ++ | ++ | | GX |
| Red-billed Leiothrix *Leiothrix lutea* | ++ | | + | | | GX |
| Orioles *Oriolus* spp. | +++ | | +++ | | | GX |
| Crested Finchbill *Spizixos canifrons* | ++ | | + | | | |
| Collared Finchbill *Spizixos semitorques* | ++ | | + | | | |
| Common Kingfisher *Alcedo atthis* | ++ | | + | | | |
| Kingfishers *Halcyon* spp. | ++ | | + | | | |
| Spotted Dove *Streptopelia chinensis* | +++ | | +++ | + | | |
| Oriental Turtle-Dove *Streptopelia orientalis* | +++ | | +++ | + | | |
| Red Collared-Dove *Streptopelia tranquebarica* | +++ | | +++ | + | | |
| Plum-headed Parakeet *Psittacula cyanocephala* | ++ | | ++ | + | | 2,II |
| Rose-ringed Parakeeet *Psittacula krameri* | +++ | + | +++ | +++ | ++ | 2 |

**Table 1. List of the most commonly traded wildlife species in Guangdong and Guangxi, 1990-1994.** **(continued overleaf)**

| | Guangdong | | Guangxi | | | Legal |
|---|---|---|---|---|---|---|
| | Market | FRecord | Market | FRecord | FTrade | Status |
| **REPTILIA** | | | | | | |
| Hawksbill Turtle *Eretmochelys imbricata* | +++ | | +++ | | +++ | 2,I |
| Leatherback *Dermochelys coriacea* | +++ | | +++ | +++ | +++++ | 2,I |
| Chinese Broad-headed Pond Turtle *Chinemys megalocephala* | +++ | +++ | +++ | | +++ | GX |
| Chinese Three-keeled Pond Turtle *Chinemys reevesii* | +++ | | +++ | +++ | +++++ | GX |
| Asian Leaf Turtle *Cyclemys dentata* | ++ | | +++ | +++ | +++++ | GX |
| Crowned River Turtle *Hardella thurjii* | ++ | | ++ | +++ | +++++ | |
| Coahuilan Box Turtle *Terrapene coahuila* | | | ++ | ++ | +++ | I |
| Chinese Three-striped Box Turtle *Cuora trifasciata* | +++ | | +++ | +++ | +++++ | 2 |
| Yunnan Box Turtle *Cuora yunnanensis* | ++ | | ++ | +++ | +++++ | 2 |
| Yellow-margined Box Turtle *Cistoclemmys flavomarginata* | ++ | | ++ | | +++ | GX,2 |
| Black-breasted Leaf Turtle *Geoemyda spengleri* | +++ | | +++ | +++ | +++++ | 2 |
| Asian Yellow Pond Turtle *Mauremys mutica* | ++ | | +++ | +++ | ++++ | GX |
| Elongated Tortoise *Indotestudo elongata* | +++ | | +++ | +++ | +++++ | GX,II,2 |
| Central Asian Tortoise *Testudo horsfieldii* | +++ | | +++ | +++ | +++++ | 1,II |
| Impressed Tortoise *Manouria impressa* | +++ | | +++ | +++ | +++++ | 2,II |
| Asian Giant Softshell Turtle *Pelochelys bibroni* | +++ | | +++ | ++ | +++ | 1 |
| Chinese Softshell Turtle *Trionyx sinensis* | +++ | | +++ | ++ | +++ | |
| Wattle-necked Softshell Turtle *Trionyx steindachneri* | ++ | | ++ | +++ | ++ | 2 |
| Common Garden Lizard *Calotes versicolor* | +++ | | +++ | | +++ | GX |
| Asian Water Dragon *Physignathus cocincinus* | ++ | | ++ | | ++ | GX |
| Geckos *Gekko* spp. | +++ | | +++ | | | |
| Tokay *Gekko gecko* | +++ | | +++ | +++ | | 2 |
| Oriental Long-tailed Lizard *Takydromus sexlineatus* | ++ | | ++ | | | |
| Yellow Monitor *Varanus flavescens* | +++ | | +++ | | +++ | I |
| Sepik Monitor *Varanus jobiensis* | +++ | | +++ | | +++ | II |
| Water Monitor *Varanus salvator* | +++ | +++ | +++ | +++ | +++++ | 1,II |
| Burmese Python *Python molurus* | +++ | +++ | +++ | +++ | +++ | 1,II |
| *Elaphe moellendorffi* | +++ | | +++ | +++ | +++ | GX |
| Copperhead Trincket Snake *Elaphe radiata* | +++ | | +++ | +++ | +++ | GX |
| Common Rat Snake *Ptyas mucosus* | +++ | +++ | +++ | +++ | +++ | II |
| *Zaocys dhumnades* | +++ | | +++ | +++ | +++ | GX |
| Banded Krait *Bungarus fasciatus* | +++ | +++ | +++ | +++ | +++ | |
| Many-banded Krait *Bungarus multicinctus* | +++ | +++ | +++ | +++ | +++ | GX |
| Asian Cobra *Naja naja* | +++ | +++ | +++ | +++ | +++ | II |
| King Cobra *Ophiophagus hannah* | +++ | | +++ | +++ | +++ | II |
| Common Worm Snake *Typhlops braminus* | +++ | +++ | +++ | +++ | +++ | GX |
| Vipers *Agkistrodon* spp. | +++ | | +++ | | | GX |
| Sharp-nosed Viper *Deinagkistrodon acutus* | +++ | | +++ | +++ | +++ | GX |
| Brown Spotted Pit Viper *Trimeresurus mucrosquamatus* | +++ | | +++ | | | |
| Stejneger's Pit Viper *Trimeresurus stejnegeri* | +++ | | +++ | +++ | +++ | |
| Russell's Viper *Vipera russelli* | +++ | | +++ | +++ | +++ | |
| **AMPHIBIA** | | | | | | |
| Chinese Giant Salamander *Andrias davidianus* | +++ | +++ | +++ | +++ | | 2,I |
| Toads *Bufo* spp. | +++ | | ++ | | | |
| Boulenger's Toad *Rana boulengeri* | +++ | ++ | +++ | + | | GX |
| *Rana japonica* | ++ | | + | | | GX |
| Tiger Frog *Rana tigerina* | +++ | ++ | +++ | +++ | | 2,II |

**Table 1. List of the most commonly traded wildlife species in Guangdong and Guangxi, 1990-1994.** *Surveys conducted by the authors.*

*Market = species observed in the market; FRecord = documentation of local forestry bureaux; FTrade = species observed at frontier trade sites; + = rare ++ = common +++ = in large quantities*

*Frequency of imported species observed by investigator at frontier trade sites or in the documentation of local wildlife authorities, + = rare +++++ = in large quantities*
*1 = Class I (fully protected); 2 = Class II (trade requires permits); I/II = listed in CITES Appendices I and II; GX = protected in Guangxi.*

*Genus, and family names only, refer to specimens that could not be identified to species level owing either to poor field conditions, incomplete documentation or limited taxonomic knowledge of the investigator; "Hyla spp.", and the like, do not indicate all the species of a genus, or the family.*

## RESULTS AND DISCUSSION

### Species in Trade

More than 190 vertebrate species were observed to have been in trade between 1990 and 1995. Among them, 21 were Class I-listed species and 73 Class II (Anon., 1994b); 24 species were listed in CITES Appendix I, and 64 in Appendix II. Animals traded in the largest quantities and available in most of the markets surveyed included primates (including Class I-listed Pigtail Macaque *Macaca nemestrinus* and François' Leaf Monkey *Trachypithecus francoisi*), Chinese Pangolins *Manis pentadactyla*, viverrids (small carnivores), falcons, accipitrids (hawks), tetraonids (grouse, including Class I-listed Sichuan Partridge *Arborophila rufipectus*), turtles, tortoises, softshell turtles, Water Monitors *Varanus salvator* (Class I), lizards, snakes and frogs (Table 1). Over half of the 190 species are not legally protected but are, however, traded in large numbers. Confiscation records of local wildlife authorities and on-site observations revealed that the turtles and snakes in trade were likely to have been wild-collected rather than farmed. Malayan Pangolins *Manis javanica* (which are not native to China) were seen on a few occasions at markets in Guangxi in numbers of between 15 and 30 at each site.

On the basis of documentation by the Guangxi Department of Forestry (for the period January 1992 to August 1994) and the Shaoguan Bureau of Forestry of Guangdong Province (1990 to 1994), more than 105 species were confiscated during those years. Of these, 15 were Class I species and 38 Class II, accounting for 51% of the total number of species in trade. Eleven were listed in CITES Appendix I and 44 in CITES Appendix II.

In Guangxi, the species most often confiscated from illegal trade in the two years documented were primates (Stump-tailed Macaque *Macaca arctoides*, Crab-eating Macaque *M. fascicularis*, Rhesus Macaque *M. mulatta*, Pigtail Macaque and François' Leaf Monkey), Chinese Pangolins (and possibly Malayan Pangolins), Burmese Pythons *Python molurus*, Water Monitor lizards, turtles and parrots (*Psittacula* spp.).

Protected species most commonly in trade and confiscated in Shaoguan Prefecture of Guangdong Province between 1990 and 1994 were primates (Stump-tailed and Rhesus Macaques), Chinese Pangolins (and possibly Malayan Pangolins), accipitrids, silver pheasants *Lophura nycthemera* and Water Monitor lizards. According to the local wildlife officers, between 30% and 40% of these animals died following poor treatment and transportation facilities. Around half were released into nature reserves or other "natural habitats", and a small number were sent to wildlife breeding centres or zoos.

In both regions, the amounts of species confiscated generally decreased each year; this might reflect the decline of natural populations, or the effort of trade control by local wildlife authorities, rather than a decline in demand, because, according to the observation of the authors and statements of local wildlife officers, prices for these species keep increasing

The authors visited Nonggang National Nature Reserve in Longzhou, in Guangxi, where the authorities had just confiscated an estimated 1500 kg of turtles, 60-70 monitor lizards and an undisclosed number of pythons from a lorry that was transporting wildlife illegally to Nanling, in northern Guangdong, and possibly to Guangzhou, the capital of Guangdong. The animals had been imported from Vietnam through one of the frontier trade sites in Pingxiang; only the turtle shipment had been covered by a permit but this was also confiscated for having been used to conceal illegal trade.

#### *Trade along the Guangxi-Vietnam border*

A thriving trade in Vietnam's natural resources and industrial products from China has brought about a rapid development in the trade in wildlife along the Guangxi-Vietnam border. Large amounts of wildlife are legally and illegally imported to China: at least 73 terrestrial species (excluding amphibians, which were not easy to identify to species level) were imported from Vietnam via the border with Guangxi over the period 1992 to 1994. Of the species in frontier trade during that period, 10 were Class I-listed species, 29 were Class II, nine were listed in CITES Appendix I and 36 in Appendix II (see Table 1). Some species that are not native to China were also found in trade, for example Yellow Monitor lizard *Varanus flavescens*, Sepik Monitor lizard *Varanus jobiensis,* Malayan Pangolin and Crab-eating Macaque; the latter two species do, however, occur in Vietnam, where they are not listed as protected.

Species that were frequently seen and available in most of the markets surveyed included François' Leaf Monkey (Class I), Rhesus Macaque, Slow Loris *Nycticebus coucang* (Class I), Chinese Pangolin, Water Monitor lizard (Class I), ducks, turtles and snakes. These are the animals most often offered on menus at restaurants in Guangdong and Guangxi. Overall, turtles and snakes were the animals most commonly traded and in the greatest quantities.

It is impossible to estimate accurately the numbers of each species in trade without conducting a year-round survey: trade changes seasonally and regionally and commodities are also transported through complex routes.

## Transportation Routes

Based on documentation provided by local wildlife authorities and interviews with local wildlife officers, the authors identified several possible major paths for the transportation of wildlife from other provinces in China, or Vietnam, to Guangxi and Guangdong (Figure 1). All of these routes pass along the inter-provincial highways or the cross-border roads between Vietnam and China. Large amounts of wildlife were transported into China through the Nongrao and Dongxing frontier trade sites and sold in the free markets in Pingxiang and Dongxing.

## Prices of Wildlife in Trade

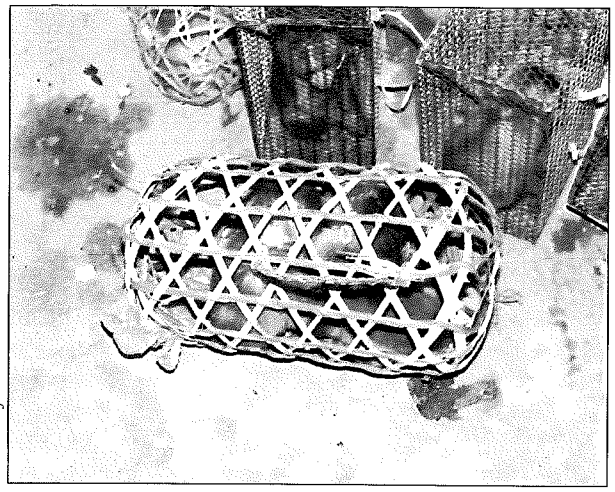
Accurate prices for wildlife in trade, especially of protected species, are very difficult to determine because transactions are made secretly and considered to be confidential. In addition, prices depend on the regularity of contacts between dealers and buyers, market demands, and the bargaining skills of buyers. Prices are generally doubled at each transaction from the local or frontier sites, to middlemen, and then to dealers or buyers in large cities, and again to the customer. No average prices could be estimated from the survey. However, approximate price ranges observed were recorded for selected species. For example, the price of live pangolins was around US$10-US$15 per kg at frontier trade sites and local markets, and US$15-US$25 per kg in the cities of Guangzhou and Nanning; in comparison, pork and beef fetched US$1.5-US$2.5 per kg in both local markets and cities. Live pangolins offered for sale in Guangdong were usually US$3-US$4 more per kg than in Guangxi. In both local markets and cities, Water Monitor lizards fetched US$6-US$12 per kg, and bamboo rats *Rhizomys pruinosus and R. sinensis*, US$5-US$7 per kg. Snakes ranged in price from US$2-US$5, poisonous snakes generally fetching two to three times the price of non-poisonous snakes, while those captured from the wild commanded up to twice the prices asked for farm-raised specimens. In large cities, prices for viverrids ranged from US$8-US$20 per kg and primates from US$10-US$45 per individual.

## Restaurant Consumption

Nanning, the capital of Guangxi, is famous for its numerous restaurants providing relatively cheap wildlife meals compared to those available in Guangdong. These meals mainly consist of the meat of Water Monitor lizards, Chinese Giant Salamanders *Andrias davidianus*, pangolins, snakes, and turtles, and are served primarily to businessmen and tourists from Guangdong and other provinces of China, Hong Kong and Taiwan. One of the authors, posing as a tourist guide, asked managers of 36 major hotels and restaurants whether they provided wildlife meals. One-third were serving meals that contained animals that are protected by law, and those interviewed showed no concern about being engaged in unlawful activities; 28% demonstrated some anxiety. Only 19% stated that selling protected wildlife is illegal and refused to serve such produce. The prices of wildlife meals were more than 20 times those of standard meals.

## Disposal of Confiscated Wildlife

Reports in China's news media of wildlife confiscations and their subsequent release into the wild have given rise to serious concern by biologists over the environmental impact of such introductions, particularly of exotic animals and/or those that harbour diseases. During this survey, the authors observed serious deficiencies in the management of the release of confiscated wildlife, despite efforts to control the problems. The capacity of wildlife authorities for controlling trade and handling confiscated animals is poor: owing to the lack of holding facilities, specimens are released in large quantities without prior health checks or a period in quarantine, and no technical planning is applied to such operations. During January to October 1991, for example, Guangxi wildlife authorities confiscated around 2700 pangolins (mostly Chinese Pangolins), of which 1600 were sent to wildlife breeding units, 160 were sent to zoos, and 300 were released into nature reserves without receiving health inspections or treatment; a further 948 specimens died. From 1988 to 1993, Chebaling National Nature Reserve (a 72-km" reserve in northern Guangdong), received 31 primates, 134 pangolins, 49 accipitrids, 122 strigids (owls), 97 tetraonids, 15 Water Monitor lizards, 31 pythons, and 169 Chinese Giant Salamanders, as well as a small number of viverrids, felids, Sambar Deer *Cervus unicolor*, Musk Deer *Moschus berezovskii*, Giant Mountain Rats *Niviventer coxingi* and bamboo rats. Again, most of these animals were released into the reserve without any health checks or period in quarantine. At least four primate species - Assam Macaque *Macaca assamensis*, Rhesus Macaque, Stump-tailed Macaque and François' Leaf Monkey - as well as the Burmese Python, Water Monitor lizard and the Chinese Giant Salamander, were introduced into this reserve in the last six years. None of these species occurs naturally in this reserve. Malayan Pangolins, which are not native to China, are found in illegal trade and the species may also have been introduced into this reserve where it may be having a serious impact on the extant population of Chinese Pangolins.

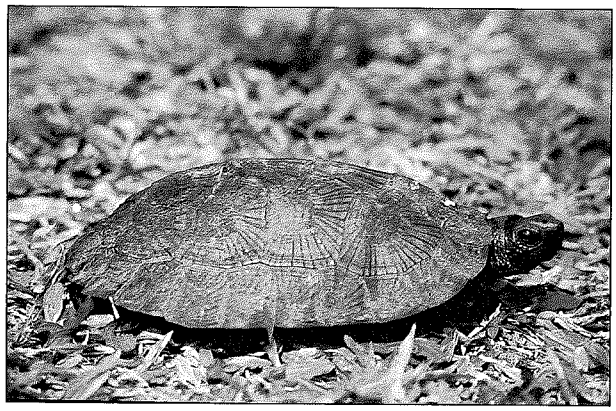


© *Li Wenjun*

**Primates in the process of being transported in cages from Nongrao frontier trade site, to Guangxi.**

## Trade Management and Controls

Efforts to improve controls have been hindered by a lack of economic resources. The wildlife authorities of Guangxi and Shaoguan in Guangdong have made some achievements in controlling wildlife trade, particularly of species that are nationally protected, but more efforts are needed to control trade in unprotected species whose numbers are in decline. Some 40 frontier trade sites have been established along the 79-km border of Guangxi with Vietnam, for example, with more than 40 roads converging on these sites. Wildlife officers are not stationed at each site, however. For example, Pingxiang City has 11 wildlife officers, but only two are employed full-time as wildlife trade inspectors. Wildlife officers interviewed stated that they could only check each site a few times per month.



© *S. Bhupathy/TRAFFIC/WWF*

**Asian Leaf Turtle *Cyclemys dentata*.**

In an effort to find ways to improve cross-border wildlife trade controls, a meeting was convened by the Sino-Vietnamese Working Group on Forestry Co-operation, in Nanning, Guangxi, on 19 December 1995, and demonstrates the will between the two countries to make progress in this area. The heads of the delegations - Mr Yang Yuchou, Director General of the Department of International Co-operation of the Chinese Ministry of Forestry, and Mr Tran Dinh Dan, Deputy Director of the Forest Protection Department of the Ministry of Agriculture and Rural Development in Vietnam - agreed that both countries shall continue to abide by the requirements of CITES and improve conservation of wildlife, especially of endangered species. Further, in accordance with their respective laws, effective action shall be adopted to prevent and curtail illegal wildlife trade along the border between the two countries. It was declared that meetings could subsequently be held whenever necessary in order to discuss progress and issues requiring further co-operation (Anon., 1995).

## Recommendations

To strengthen law enforcement, a trained wildlife law enforcement team in both regions is essential. A set of handbooks to identify species in trade, and explaining law enforcement procedures and the requirements for handling confiscated wildlife, should be developed and provided to local wildlife officers. The Ministries of Forestry and Agriculture and the CITES Scientific and Management Authorities should set up specific short-term training programmes for provincial and local personnel. The release of wildlife should be stopped until carefully designed procedures and a set of guidelines have been established and communicated to the relevant agencies to assist them in such operations.

It is also important to examine how the restaurant and food trade influences demand for exotic and local species. It would be valuable to gain a better understanding of the uses to which wildlife is put, for example which commodities are considered to be of medicinal value, and by whom, so that law enforcement efforts can be targeted. Any control programme is hindered without the understanding and support of the general public, however. Campaigns, distribution of materials highlighting these concerns, and publicity via the news media can play an important part in raising people's awareness. Wildlife trade, particularly at the border with Vietnam, yields high profits and tax income to local communities in Guangdong and Guangxi. Thus, careful evaluation of the effects on local communities of controlling wildlife trade, their financial needs, and support from other provinces, the state government and from overseas, is needed to assist in the national or regional control of frontier wildlife trade. However, this trade cannot be effectively controlled if concerted efforts are not made on both sides of the border.

**Acknowledgements**

The authors sincerely appreciate the financial support of the State Science and Technology Committee of China, and Graduate Program in Organismic and Evolutionary Biology, University of Massachusetts, Amherst, USA. They thank those who provided enthusiastic assistance in this survey, especially Liu Ziming, Wei Yi, Zou Yi, He Zhen'en, Li Chang, Rao Jiteng, Li Jianbiao, and Chen Shu. Reviews of earlier drafts of this manuscript by J.A. Mills, TRAFFIC East Asia, M. Phipps, TRAFFIC East Asia-Taipei, C. Hin Keong, TRAFFIC Southeast Asia, and M. Lau, Department of Ecology and Bio-diversity, University of Hong Kong, are also appreciated.

**References**

Anon. (1994a). *Picture Album of the Protected Wildlife of National Importance.* Northeast Forestry University Publishing House, Harbin. (In Chinese).

Anon. (1994b). Ministry of Forestry, Division of Wildlife and Forest Plant Protection. A collection of laws, regulations and documents related to wildlife conservation. China Forestry Publishing House, Beijing. (In Chinese).

Anon. (1995). Minutes of panel discussion of the Sino-Vietnamese working group on forestry co-operation. 19 December.

Chen, L., Wang, X. and Wang, S. (eds) (1994). *Biodiversity of China.* Science Press, Beijing. (In Chinese).

Cheng, T. (1962). *Fauna Economica Sinica* (Aves). Science Press, Beijing. (In Chinese).

Cheng, T. (1976). *A Distribution List of Chinese Birds.* Science Publishing House, Peking. (In Chinese).

Cheng, T. (ed.). (1989). *Birds of the World, Latin, Chinese, and English Names.* Science Press, Beijing. (In Chinese).

Dollinger, P. (ed.). (1981). *Identification Manual Volume 5: Parts and derivatives II.* CITES Secretariat, Lausanne, Switzerland.

Dollinger, P. (ed.). (1984). *Identification Manual Volume 4: Parts and derivatives I.* CITES Secretariat, Lausanne, Switzerland.

Dollinger, P. (ed.). (1985). *Identification Manual Volume 3: Reptilia, Amphibia, Pisces.* CITES Secretariat, Lausanne, Switzerland.

Dollinger, P., (ed.) (1988a). *Identification Manual Volume 1: Mammalia (Monotremata to Cetacea).* CITES Secretariat, Lausanne, Switzerland.

Dollinger, P., (ed.) (1988b). *Identification Manual Volume 1a: Mammalia (Carnivora to Artiodactyla).* CITES Secretariat, Lausanne, Switzerland.

Dollinger, P. (ed.) (1988c). *Identification Manual Volume 2: Aves (Struthioniformes to Columbiformes).* CITES Secretariat, Lausanne, Switzerland.

Dollinger, P., (ed.) (1988d). *Identification Manual Volume 2a: Aves (Psittaciformes to Passeriformes).* CITES Secretariat, Lausanne, Switzerland.

Gao, Y. *et. al.,* (1987). *Fauna Sinica Volume 8 Carnivora.* Science Press, Beijing. (In Chinese).

Hu, S. *et. al.,* (1962). *Album of China's Animals - Reptiles.* Science Press, Beijing. (In Chinese).

Lau, M. W., Ades, G., N., Goodyer and Zou, F. (1995). Study on the Wildlife Trade in Southern China including Hong Kong and Macao. China Council for International Co-operation on Environment and Development, Biodiversity Working Group. Unpublished report.

Le Dien Duc, Nash, S.V. and Broad, S.R. (1993). Guidance on the accession of the Socialist Republic of Vietnam to CITES. TRAFFIC Southeast Asia and CRES. Special Report. Unpublished report.

Liu, C. (1959). *Album of China's Animals - Amphibians.* Science Press, Beijing. (In Chinese).

Li, Y. and Li, D (in prep.). The investigation on live wildlife trade across Guangxi borders between China and Vietnam.

Shou, Z. (ed.) (1962). *Fauna Economica Sinica (Mammalia).* Science Press, Beijing. (In Chinese).

Sonobe, K. and Usui, S. (eds) (1993). *A Field Guide to the Waterbirds of Asia.* Wild Bird Society of Japan.

Vaughan, T.A. (1986). Mammalogy. Saunders College Publishing. Third edition.

*Li Wenjun and Todd K. Fuller, Department of Forestry and Wildlife Management and Graduate Program in Organismic and Evolutionary Biology, University of Massachusetts, Amherst, MA 01003, USA; Wang Sung, Executive Vice Chairman, Endangered Species Scientific Committee, People's Republic of China, 19 Zhong-guang-cun Lu, Haidian, Beijing 100080, China.*

# Status of the Queen Conch Fishery in the Caribbean

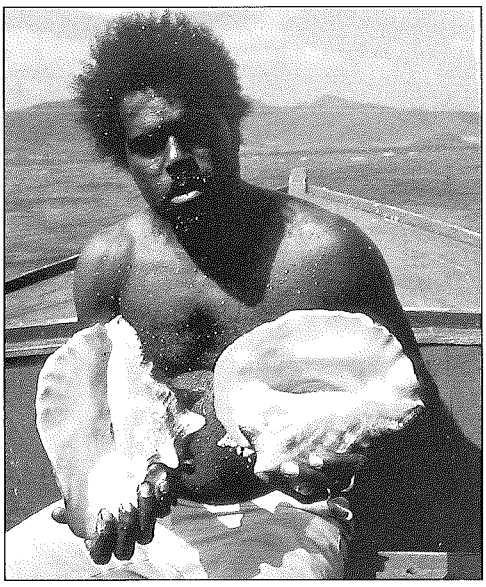
***Teresa A. Mulliken***

*The Queen Conch* Strombus gigas *occurs throughout the Caribbean, where the meat has been exploited by subsistence and commercial fisheries for centuries. The shells of this marine mollusc are also used as curios and in jewellery but are generally of secondary importance to the meat. In recent years, populations of this species have been depleted, giving rise to concern over the future of the conch fishery. Despite legislation in many countries to manage the fishery, and the listing of the species in CITES Appendix II, regulations are not being enforced. The following paper is based on information compiled and analysed by IUCN/SSC and TRAFFIC International in the context of the CITES Animals Committee 'Review of Significant Trade', a process that seeks to identify and reduce trade in CITES Appendix II-listed species that may be detrimental to those species' wild populations. The Appendix II-listing has succeeded in drawing the attention of Queen Conch range states to the need for more effective implementation of CITES controls.*

## Introduction

The Queen Conch *Strombus gigas*, an edible marine gastropod found in the relatively shallow waters of the Caribbean, has been a staple food in the diet of local people for hundreds of years, as well as being one of the most valuable fishery resources in the region (Brownell and Stevely, 1981). Commercial harvest and international trade have been reported since before the turn of the century, much of the trade in the early 1900s consisting of dried meat (Doran, 1958, cited in Anon., 1995a). Following a downturn mid-century, the trade was revived in conjunction with advances in freezer technology and a shift to trade in frozen meat (Anon., 1995a). The commercial conch fishery was mainly of local importance until 20 years ago, when growth in the local human population and the tourism industry spurred a dramatic increase in conch fishing to meet the coincident increase in demand (Appeldoorn, 1994a).

Once second only to finfish as a source of protein in native diets (Brownell and Stevely, 1981), *S. gigas* is now consumed predominantly as a speciality food owing to its rarity and relatively high market value (Berg, *in litt.* to IUCN/SSC, 1991; Munro, *in litt.* to IUCN/SSC, 1991). The meat is traded internationally in fresh, dried and frozen form. The beautiful and brightly coloured shells are also sold as marine curios and used in making jewellery. Shells are generally a byproduct of the meat trade rather than the result of directed harvests.



© *Carl Berg, Jr.*

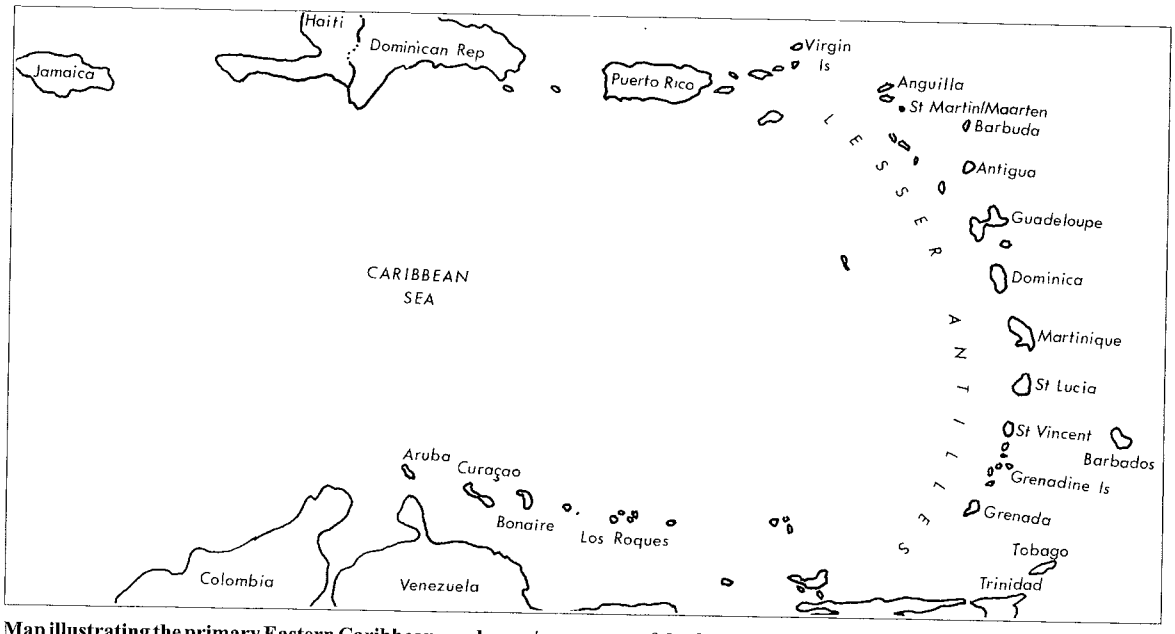
The Queen Conch is the only *Strombus* species of major economic value in the Caribbean, although other *Strombus* species are heavily fished in Mexico. In Cuba, which lacks access to the large US market for Queen Conches, *S. gigas* is also fished for bait (Appeldoorn, *in litt.* to IUCN/SSC, 1991). Most other conch species have little economic value except for the shell trade (Berg, *in litt.* to IUCN/SSC, 1991).

Overfishing to meet the demand for conch meat is considered to be the major cause of declining *S. gigas* populations. At present, declines have been limited to relatively shallow areas, deep water providing a refuge from fishing as the conches are often difficult and/or uneconomic to exploit (Appeldoorn, *in litt.* to IUCN/SSC, 1991; Glazer, 1991; Munro, *in litt.* to IUCN/SSC, 1991). The use of SCUBA equipment has allowed expansion of the fishery into previously unexploited areas, however, thereby placing many deep water populations at risk.

Concern has also been expressed regarding the potential long-term effects of overfishing on recruitment rates. Habitat degradation and water pollution may affect local population abundance and recruitment rates (Appeldoorn, *in litt.* to IUCN/SSC, 1991; Berg, *in litt.* to IUCN/SSC, 1991).

© *S. Wells*

**Queen Conches *Strombus gigas* on a mail boat, Bahamas.**




**Map illustrating the primary Eastern Caribbean producers/consumers of the Queen Conch *Strombus gigas*.**
***Map not drawn to scale.***

## Methods

The majority of the information provided below was compiled and analysed by IUCN/SSC and TRAFFIC International in the context of the CITES Animals Committee 'Review of Significant Trade in Animal Species Included in CITES Appendix II' (Anon., 1996). This review is conducted in accordance with CITES Resolution Conf. 8.9, and seeks to identify and reduce trade in Appendix II species that is conducted in violation of CITES Article IV, i.e., that is likely to be detrimental to those species' wild populations. Questionnaires were distributed to most range states during the data collection phase of the significant trade review, and all range states had the opportunity to review and comment on a preliminary draft of the Animals Committee Report.

## Species Biology and Ecology

Queen Conches primarily inhabit sandy sea floors in clean waters that support the growth of the numerous species of algae and seagrasses upon which they feed. They may also be encountered on gravel, coral gravel, rocks and other hard substrates (Brownell and Stevely, 1981). Shallow coastal habitats such as seagrass and sandy bottoms in protected bays are critical inshore habitats for the juvenile conches (Stoner and Ray, 1993).

The species has been found to occur from depths of just a few centimetres to at least 120 m. Field studies in the Turks and Caicos Islands have shown that some Queen Conches migrate seasonally, moving inshore to shallower waters during the northern spring and offshore during autumn (Hesse, 1979). This movement coincides with the main copulation and spawning season, which lasts from February to October or November (Glazer, 1991). Reproductive capacity is high owing to the production of numerous planktonic larvae (Glazer, 1991; Wells, *in litt.* to IUCN/SSC, 1991), and larval exchange is thought to occur over great distances (Campton *et al.*, in press); it is possible that a local population depends upon recruitment of larvae that originated elsewhere (Berg and Olsen, 1989). Once they settle, small, immature conches usually bury themselves in sand during daylight and are rarely observed (Brownell and Stevely, 1981).

Most Queen Conches reach what is considered acceptable market size at approximately 2.5 years and may live upwards of 20 years (Berg, 1976; C.J. Berg pers. comm. to Glazer, 1991 and to Appeldoorn, 1994b). Sexual maturity does not occur until the conch is approximately four years old, with the result that conches are marketable before they are able to reproduce (Berg and Olsen, 1989). Maximum shell length, which is variable, averages 20 cm-21 cm (Coulston *et al.*, 1989 cited in Berg and Olsen, 1989). Additional growth occurs as a progressive thickening of the shell lip (Appeldoorn, 1988). Total shell length may decline over time owing to erosion, with the effect that the shells of young conches can be larger than those of older individuals (Appeldoorn, 1994b).

## Distribution and Status

The Queen Conch is found in Caribbean waters extending from the coastline of northern South America and Central America, northwards through the Lesser Antilles and northwest as far as the Bahamas and southern Florida. Queen Conches are also found in the waters around Bermuda, north of the species' main range, and may occur in the Gulf of Mexico (Aranda and Desmarais, 1994; Brownell and Stevely, 1981).

# TRAFFIC BULLETIN

# INDEX VOL. 15

**Entries in bold indicate illustrations**

Population densities have been shown to be 'quite variable', ranging from the healthy populations of, for example, St. Lucia, to the severely overfished populations of Puerto Rico and Venezuela (Appeldoorn, 1994a; Nichols and Jennings-Clark, 1994). Although populations have decreased throughout much of the species' range, some areas remain comparatively unaffected (Appeldoorn, *in litt.* to IUCN/SSC, 1991; Glazer, 1991; Munro, *in litt.* to IUCN/SSC, 1991). In general, however, the picture is one of decline.

With the exception of those of St Lucia, all Queen Conch populations in the Lesser Antilles are reported as having been overfished. The status of northern Caribbean populations is somewhat more variable. In Cuba, 'great drops' in population densities in many areas were noted by Munoz *et al.* (1987), the result of indiscriminate collection. Depleted populations have not recovered and may be continuing to decline despite regulatory controls, and possibly a decline in larval recruitment. However, populations along the south coast of Cuba are considered healthy (Appeldoorn, *in litt.* to IUCN/SSC, 1991). Queen Conches have been overfished in localized areas in the Bahamas (Appeldoorn, 1994a), especially in the vicinity of population centres, however are abundant on the majority of the Bahamian Banks (Ninnes, *in litt.* to CITES Secretariat, 1995).

South and Central American populations are similarly showing signs of decline. Some areas are believed to be overfished in Colombia (Appeldoorn, 1994a), where the size of specimens caught is almost entirely below the legal limit (Mora, 1994). In Venezuela, fishing pressure has reduced populations to very low densities in the coastal zone and most islands. In Mexico, Rodríguez Gil (1994) noted that total landings of conches (all species) have declined, although fishing effort has increased. Populations in Costa Rican waters are reported to be declining (Alfaro, *in litt.* to IUCN/SSC, 1994), and those of Belize to be overfished (Appeldoorn, 1994a; Berg, 1987).

The Queen Conch populations of Jamaica and the Turks and Caicos Islands appear relatively healthy in comparison with those of many other countries. On the Pedro Banks of Jamaica density is estimated as being 10-100 times greater than most other areas of the Caribbean subject to fishing (Donaldson, *in litt.* to CITES Secretariat, 1995). These populations are currently subject to heavy fishing pressure, however, and may be depleted in future unless the planned quota reductions bring harvests within sustainable levels (Appeldoorn, pers. comm., 1996). Appeldoorn (*in litt.* to IUCN/SSC, 1991) considered the population of the Turks and Caicos Islands to be healthy, although intensively fished. Ninnes (*in litt.* to IUCN/SSC, 1995) adds that annual catch rates have rarely exceeded sustainable estimates, and that 'sustained overfishing' is unlikely.

## Collection of Queen Conches

The Queen Conch was an important resource to pre-Columbian inhabitants throughout the Caribbean. In addition to the use of meat for food, shells were fashioned into religious artefacts and tools such as scrapers and fish hooks (Appeldoorn, 1991). In Cuba, conch shells were also used for making plates, hammers, vessels, etc. (Munoz *et al.*, 1987). In Honduras, the Garifuna continue to use conch shells in various festivities (Morales, *in litt.* to IUCN/SSC, 1995).

As commercial fishing developed, conches were pulled from deeper water by the use of long poles with hooks or tines on the end (Berg and Olsen, 1989); these can reach up to 9 m (Brownell and Stevely, 1981). The use of SCUBA to fish conches from deeper waters has increased, and has resulted in a coincident rise in serious health problems from compression sickness. Depletion of local Queen Conch populations has forced fishermen to replace sailing sloops, wooden canoes and skiffs with farther-ranging fibreglass boats powered by engines (Berg and Olsen, 1989; Brownell and Stevely, 1981).

## Meat Extraction

Most fishermen cut the Queen Conch from its shell near the fishing grounds, either in their boats or on shore. This enables them to carry greater quantities of meat to the market and at greater speed. The meat is removed by knocking a hole in the shell, inserting a sharp blade and cutting the animal free; the shells are generally discarded to form huge mounds. Shell traders remove the meat by freezing or boiling the animal in order to avoid damaging the shell (Brownell and Stevely, 1981).

## Conch Cuisine

Rathier and Battaglya (1994) comment that the Queen Conch is 'a food product with status as a cultural symbol' important to creole cooking. It is eaten in many parts of the Caribbean, commonly in the form of steaks. The live animal is cut from the shell, pounded and flattened, and panfried in butter and lime juice; conch fritters, consisting of minced conch meat that has been spiced with chillies, and conch soup, are also popular dishes throughout the Caribbean (S. Wells, pers. comm., 1996).

| COUNTRY | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| **Range States** | | | | | | |
| Aruba | 0 | 0 | 0 | 0 | 0 | 0 |
| Bahamas | 54744 | 0 | 0 | 0 | 0 | 0 |
| Belize | 3629 | 0 | 1724 | 0 | 0 | 0 |
| Bermuda | 0 | 0 | 0 | 0 | 0 | 0 |
| Cocos Island | - | - | 1090 | - | - | - |
| Colombia | 1273 | 56485 | 52220 | 23945 | 21545 | 30287 |
| Costa Rica | 0 | 0 | 886 | 0 | 0 | 0 |
| Dominican Republic | 11338 | 0 | 0 | 8229 | 0 | 57102 |
| Guadeloupe | 0 | 0 | 0 | 0 | 0 | 0 |
| Haiti | 7456 | 855 | 3000 | 0 | 0 | 0 |
| Honduras | 77213 | 111607 | 121322 | 64179 | 146538 | 96857 |
| Jamaica | 49426 | 204181 | 340478 | 453318 | 582525 | 402214 |
| Martinique | 0 | 0 | 0 | 0 | 0 | 0 |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 |
| Netherlands Antilles | 2079 | 0 | 0 | 16643 | 0 | 0 |
| Panama | 1425 | 284 | 0 | 1022 | 0 | 0 |
| Turks and Caicos Is | 126013 | 94816 | 118273 | 147023 | 329940 | 297240 |
| TOTAL | 334596 | 468228 | 643172 | 715973 | 1101039 | 899517 |

**Table 1. Reported US imports of conch meat (in kg) from range states, 1989-1994.**
Conch imports from Caribbean countries are thought to be *Strombus gigas*; species of other imports are unknown.
- = data not available.

*Source: National Marine Fisheries Service,* in litt., *1995, compiled from US Bureau of Census data.*

## Harvest and Trade

The magnitude of the current and potential Queen Conch harvest in the Caribbean is not well known (Appeldoorn, 1994a). International trade is not well reflected by Customs data or those compiled by the Food and Agriculture Organization of the United Nations (FAO) because many countries do not identify conch imports or exports to the species level but, rather, as molluscs, snails, and/or other marine shells/meat. Berg and Olsen (1989) note that the different methods among countries for processing conch meat before it is weighed make it difficult to estimate the number of conches represented by reported landings or trade.

Appeldoorn (1994a) estimates total landings of *S. gigas* in the Caribbean to be in the order of 4000 t a year. This provides an indication of the potential scale of international trade in S. gigas; however, it is important to bear in mind that much of the harvest is consumed locally by residents and tourists and, further, that approximately a third is used for bait in Cuban fisheries.

Conch harvests of 400 t or greater per year have been estimated for the Bahamas, Colombia, Cuba, Honduras, Jamaica and the Turks and Caicos Islands, for each country, with smaller amounts taken in other range states. With the exception of those from Cuba, the majority of harvests in these countries appear to have been destined for export, with domestic consumption and the tourist trade absorbing smaller amounts.

Based on a total harvest of approximately 4000 t per year and a wholesale value of US$10/kg, Appeldoorn (1994a) estimates the total potential value of the Queen Conch fishery to be in the region of US$40 million per year. However, the approximately 1500 t taken for the Cuban bait fishery represents a loss of a significant amount of this potential income. Appeldoorn (1994a) notes that the value of the Queen Conch fishery may be several times more if one takes into consideration the creation of jobs in processing and marketing, and that the potential value of the fishery could be considerably higher given proper management. An example of the economic importance of the trade to individual countries is provided by the fisheries of the Turks and Caicos Islands, where the value of Queen Conch earnings to fishermen is US$1 615 000, or 22% of the value of all fisheries (Ninnes, *in litt.* to IUCN/SSC, 1994).

The US Bureau of Census data compiled by the US National Marine Fisheries Service (*in litt.*, 1995) provide an indication of the scale of trade into the USA (Table 1). Most imports from Caribbean countries are believed to involve *S. gigas* (Stansell, *in litt.* to CITES Secretariat, 1995).

CITES annual report data are not available prior to 1992. A number of countries active in the conch trade are not party to CITES (e.g. Haiti, Jamaica, Turks and Caicos Islands and Netherlands Antilles), further limiting the availability of CITES annual report data. CITES data available at the time of writing (February 1996) are provided in Table 2. Comparison of these data with US Bureau of Census data (Table 1) and information provided by range states indicates that significant international trade in Queen Conches involving CITES Parties is going unreported both in CITES annual reports and US Bureau of Census data.

| | 1992 | 1993 | | | 1994 | | 1995 | |
|---|---|---|---|---|---|---|---|---|
| **Country of Export** | **Shells** | **Bodies** | **Shells** | **Meat (kg)** | **Meat (kg)** | **Shells** | **Live (kg)** | **Meat (kg)** |
| **Countries with wild populations of *S. gigas*** | | | | | | | | |
| Bahamas | 3 000 | | 110 407 | 293 773 | 51 377 | | | |
| Dominican Republic | | | | | 32 277 | | | |
| French Antilles | | | | 59 082 | | | | |
| Haiti | | | 254 548 | | | 7 030 | | |
| Honduras | | | | | | | 2 281 | 260 172 |
| Jamaica | | 259 242 | | | 20 856 | 11 640 | | |
| Mexico | 866 kg | | | | | | | |
| Netherlands Antilles | | | | | 61 364 | 9 | | |
| Saint Lucia | | 2 130 | | | | | | |
| Saint Vincent and the Grenadines | | | | 1 800 | | | | |
| Trinidad and Tobago | | | | | | 65 | | |
| Turks and Caicos | | 20 800 | 5 | 6 | | | | |

**Table 2. CITES-reported exports of Queen Conches *Strombus gigas*, 1992-1995.**
*Source: CITES annual report data.*

## Conservation Measures

### CITES

The Queen Conch was included in CITES Appendix II in 1992, with the effect that all international trade in this species involving CITES Parties should be accompanied by valid CITES export permits or comparable documentation, and reported to the CITES Secretariat. Analysis of available information and CITES annual report data clearly indicates that the vast majority of trade involving CITES Parties is taking place without adherence to these requirements. There is also evidence that the Queen Conch is declining throughout much of its range, including within the territorial waters of some countries exporting large quantities of this species. This suggests that harvesting is not being controlled within sustainable levels, and therefore that, in some cases, exports are probably being allowed in violation of the 'non-detriment finding' requirement of CITES Article IV.

Although to date the effectiveness of the CITES listing in controlling much of the trade has been questionable, Appeldoorn (*in litt.* to IUCN/SSC, 1994) believes that the inclusion of the Queen Conch in Appendix II has encouraged exporters in both Haiti and Jamaica (non-CITES Parties) to accept management of their stocks, to good effect.

Awareness of the need to implement the CITES listing has also increased within the USA, with the result that over 100 t of Queen Conches not covered by necessary documentation have been seized.

### Regional harvest controls

In January 1990, 13 nations party to the Cartagena Convention of the UNEP Regional Seas Programme signed the Protocol for Specially Protected Areas and Wildlife (SPAW Protocol), which lists species of plants and animals to be provided with various levels of protection. *Strombus gigas* was included in Annex III, which requires that appropriate measures be adopted by Parties to ensure the protection and recovery of the Queen Conch and to regulate the use of this species to maintain it at the highest possible population levels. The Protocol is not yet in force, however, as, at the time of writing, only two of the 13 signatories have ratified this treaty (A. Vanzella-Khouri, pers. comm., 1996). Fisheries controls for the Queen Conch are included in the harmonized fisheries system and associated regulations agreed and recommended for adoption by the Organization of Eastern Caribbean States (OECS). These include a recommendation that the Queen Conch not be harvested prior to formation of a flared lip (P. Murray, pers. comm, 1996).

### Domestic legislation

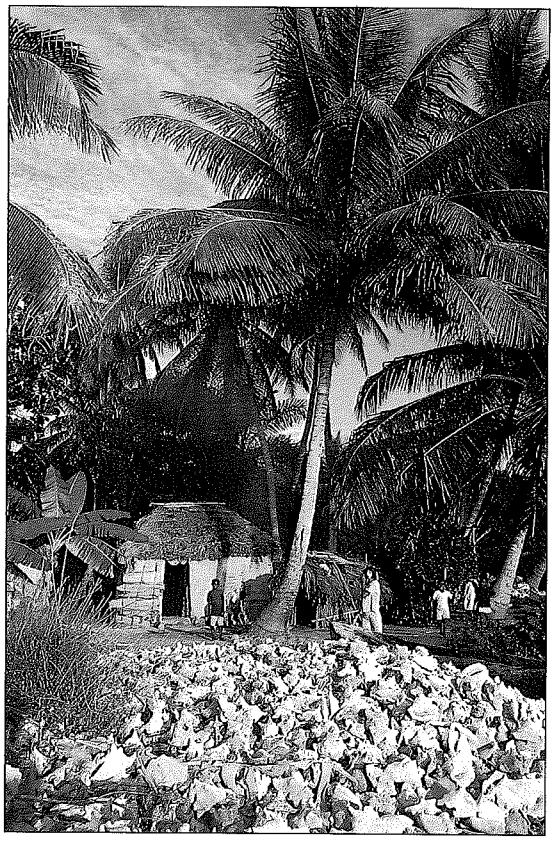
Most Caribbean countries and dependencies have legislation relating to the management and/or protection of conch fisheries (Table 3), with the exception of Barbados, Puerto Rico and Trinidad and Tobago. However, enforcement is ineffective in many areas, and regulations largely ignored (Appeldoorn, 1991). Appeldoorn (1994a) notes that illegal fishing continues in Belize, Colombia, Mexico and Venezuela and illegal harvest has also been reported in Costa Rica (Alfaro, *in litt.* to IUCN/SSC, 1994), Cuba (Ferrer and Alcolado, 1994), French Antilles (Todisco, *in litt.*, 1995), Netherlands Antilles (Sybesma, *in litt.* to CITES Secretariat, 1995) and St Lucia (Nichols and Jennings-Clark, 1994).

## The Fisheries and Trade of Key Range States

As noted previously, the Queen Conch is primarily harvested for meat, much of which appears to be consumed locally rather than exported. Even the international trade primarily involves import markets within the range of this species, e.g., the USA (primarily Florida) and the French Antilles.

**Bahamas** Appeldoorn (1994a) estimates that 410 t of conches were harvested in 1991, with primary uses being domestic consumption and the tourist trade. However, Bahamas' CITES annual reports show the export to the USA of 110 407 shells and 293 710 kg of meat in 1993, the latter representing 75% of total harvest volumes estimated for 1991. US CITES annual report data show the import from the Bahamas of a smaller number of shells and no meat in 1993, US Bureau of Census import data similarly recording much smaller trade volumes.

A 1994 CITES annual report had not been submitted by the Bahamas when these data were compiled and



© E. Wood

**Pile of Queen Conch *Strombus gigas* shells, Haiti.**

| REGULATORY MEASURES | COUNTRY |
|---|---|
| Fishery closed | Bermuda, Costa Rica, Bonaire (NL), Florida (US) |
| Exports banned | Costa Rica, Haiti (suspended) |
| Minimum size limits | Belize, Colombia, Guadeloupe (FR), Haiti, Martinique (FR), Netherlands Antilles, St Lucia, Turks and Caicos (UK), Virgin Is (US) |
| Harvest of juveniles prohibited | Bahamas, Cuba |
| Fishery closed in some areas | Bahamas, Colombia, Cuba, Mexico, Venezuela |
| Closed season during part of the year | Belize, Colombia, Cuba, Honduras, Jamaica (proposed), Mexico, Venezuela, Virgin Is (US) |
| Use of SCUBA to harvest *S. gigas* prohibited | Belize, Colombia, Martinique (FR), Turks and Caicos Is (UK) |
| Use of 'hookahs' to take *S. gigas* prohibited | Haiti (seasonal) |
| National harvest quotas established | St Martin (FR), Jamaica |
| National export quotas established | Colombia, Turks and Caicos (UK) |
| Harvest quotas for specific fishery areas | Cuba, Jamaica, Mexico |
| Individual export quotas established | Belize, Saba (NL), Virgin Is (US) |
| Fishers required to be licensed | Turks and Caicos Is (UK), Venezuela |
| No conservation measures | Barbados, Puerto Rico (US), Trinidad and Tobago |
| CITES Party | Bahamas, Barbados, Belize, Bermuda (UK), Colombia, Costa Rica, Cuba, Dominican Republic, French Antilles (FR), Guatemala, Honduras, Nicaragua, Panama, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, USA, Venezuela |
| Not a CITES Party | Dominica, Grenada, Haiti, Jamaica, Netherlands Antilles, Turks and Caicos Is (UK) |
| SPAW Protocol | Antigua and Barbuda, Colombia, Cuba, France, Guatemala, Jamaica, Mexico, Netherlands, St Lucia, Trinidad and Tobago, UK, USA, Venezuela |
| Organization of Eastern Caribbean States | Antigua, British Virgin Islands*, Dominica, Grenada, Montserrat, St.Kitts/Nevis, St Lucia, St Vincent and the Grenadines, Anguilla* |
| No information | Dominica, Dominican Republic, Grenada, Guatemala, Nicaragua, Panama, St Kitts/Nevis, St Vincent and the Grenadines |

* 'Associate Members' - not original signatories to the declaration, but eligible for full benefits.

**Table 3. Regulatory measures in place in Queen Conch *Strombus gigas* range states.**

therefore further assessment of reported export volumes was not possible for this study. US Customs data showed the import of approximately 16 t of conches from the Bahamas in 1994, with no such trade being reflected in the US CITES annual report for that year. Japan's 1994 CITES annual report showed the import of over 50 t of Queen Conch meat from the Bahamas, indicating that the USA is not the Bahamas' only export market.

Various researchers have concluded that Queen Conches are locally depleted in the Bahamas but remain plentiful on the Bahamian Banks. The fishery has been closed in several areas, and take of juveniles is prohibited (Appeldoorn, 1994a). Given that a substantial local and export market exists, it is unclear that these measures alone will be sufficient to prevent further depletion of Queen Conch stocks in this country.

**Belize** Another important source of Queen Conches in international trade, Belize is reported to have exported over 1100 t from 1988 to 1994 at an average price of US$7.96/kg; the total value of this fishery was therefore close to US$9m (Villanueva, *in litt.* to CITES Secretariat, 1995). It is interesting to note that export volumes from 1992 through 1994, which topped 200 t each year, fall far short of Belize's export quota of 325 t. Given the value of this fishery, this could indicate that production falls short of potential demand, and lends weight to conclusions that stocks are depleted. The USA was reported to be the main market for Queen Conches exported from Belize (Villanueva, *in litt.* to CITES Secretariat, 1995). However, CITES annual report data do not reflect any trade from Belize, a CITES Party, and US Bureau of Census data show only limited imports from this country.

**Colombia** Queen Conches are fished from offshore banks administered jointly with the USA. A total of 400 t of *S. gigas* was harvested in 1990 (Glazer, 1991), most of which was exported (Appeldoorn, 1994a). No exports from Colombia have been recorded in CITES annual report data, however US Bureau of Census data do show some imports; other trade to the USA may not be reflected if take was by US vessels. In 1995, the Government established an annual export quota of 32 t of unprocessed meat and 31 t of processed meat (Anon., 1995b). This quota is far lower than export levels indicated by previous harvest rates, and should help reduce pressure on Colombia's Queen Conch populations if adequately enforced.

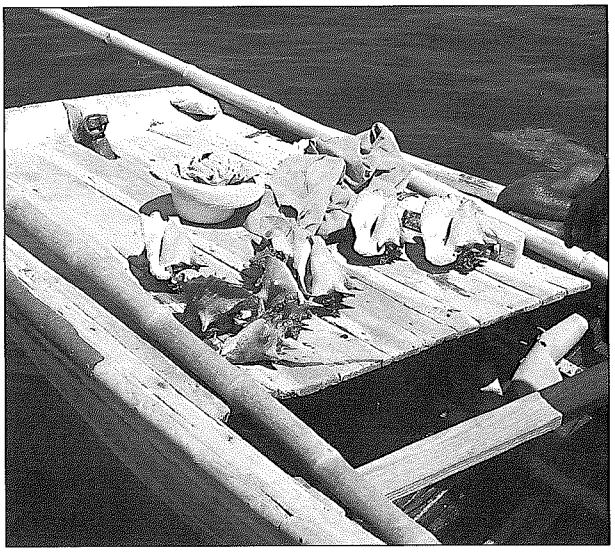
**Cuba** The Queen Conch has not traditionally been an important component of the Cuban diet (Ferrer and Alcolado, 1994), although it is consumed in coastal villages (Brownell and Stevely, 1981). It was only in the 1960s that the species began to be commercialized, exploitation increasing considerably in the mid-1970s, and peaking at 2578 t in 1977. The fishery collapsed in 1978, and a total harvest ban was established for a four-year period, with the subsequent establishment of harvest restrictions including quotas (Ferrer and Alcolado, 1994). The initial catch quota of 555 t was increased to 780 t in 1984 (Munoz *et al.*, 1987), then reduced to 200 t in 1986. Elimination of catch quotas for the north-east and north-central fishing zones in 1990 due to concern that stocks had declined reduced the total quota to 55 t (Ferrer and Alcolado, 1994).

These regulations were not effective in reducing offtake to sustainable levels, however, as they were largely undermined by an illegal and unregulated bait fishery, with three commercial companies alone estimated in 1989 to be taking 1500 t of conches per year. The meat of these conches is used as bait for catching less commercially valuable fish, a fishery that is hard to dissuade owing to the strength of the tradition, ease of fishing for conches and the time required by fisheries to shift to another source of bait (Ferrer and Alcolado, 1994). While enforcement of and compliance with regulations related to commercial fisheries are good, these only apply to the non-bait fishery, preventing overall management of Queen Conch harvests from being effective (Appeldoorn,1994a).

**French Antilles and Netherlands Antilles** The French West Indies are reported by Stevely (1981) to be one of the main consumers of Queen Conches in the Caribbean. This would seem to be borne out by the fishing and trade patterns of the French Antilles and the neighbouring islands of the Netherlands Antilles. Consumption of Queen Conch meat in the French Antilles (Martinique, Guadeloupe (incl. St Martin)) has depleted local stocks and provided a strong market for Queen Conches harvested in the Netherlands Antilles (Curaçao, Bonaire, St Maarten, St Eustatius and Saba) and elsewhere in the Caribbean. Furthermore, there are strong indications of both illegal harvest and trade to supply what may be a growing demand for conch meat in the French Antilles.

Concern has been expressed regarding harvests near and trade through the island of St Martin/St Maarten, part of which is administered by France, another part by the Netherlands Antilles, and includes a Customs-free area not covered by the Customs authorities of either (Todisco, *in litt.*, 1995).

During a three-month period in 1993, St Martin fishermen used European Union (EU) internal trade certificates to transport 60 t of *S. gigas* from the French part of the island to Guadeloupe. This volume exceeded the maximum estimated take in this zone of approximately 50 t per year, indicating that large quantities of *S. gigas* covered by these permits had probably been harvested from outside French territorial waters. To address this situation, a monthly catch quota of 2100 kg was established in St Martin, effective March 1994. Reported trade in 1994 declined as a result, with authorities receiving requests for certificates to export a total of 14.3 t of *S. gigas* from St Martin to Guadeloupe during that year (Todisco, *in litt.*, 1995).



© E. Wood

**Thin-lipped (young) Queen Conches *Strombus gigas*, Haiti.**

Numerous requests for permits to export conches from St Maarten to Guadeloupe and Puerto Rico were received by the Government authorities in the Netherlands Antilles in 1995 (Sybesma, *in litt.* to CITES Secretariat, 1995). Some of these were for permits to export 45 000 lbs (20.5 t) of meat per week, stated as having been harvested from the waters off St. Maarten. The Management Authority contends that such harvest rates were impossible in these waters, and that the conches either originated in other Caribbean countries or on the Saba bank, where a fishing permit is mandatory. Further, they noted that no export permits had or would be issued until research determined the extent of existing stocks and sustainable harvest rates and, finally, voiced concern that illegal fishing activities could deplete remaining stocks within a few years.

The demand for *S. gigas* in Guadeloupe was not met simply by trade from other Antilles islands, however. In 1994, the French Management Authority received 17 requests from Guadeloupe for permits to import a total of 340.55 t from Jamaica (Todisco, *in litt.*, 1995).

Large amounts of Queen Conches are also consumed in Martinique, where it is eaten as part of celebrations, a use which appears to be increasing (Todisco, *in litt.*, 1995). Demand for conch meat has outpaced production, with the result that near-shore stocks have been depleted and conch meat must now be imported (Rathier and Battaglya, 1994). Total yield was estimated at 27.7 t of meat from January 1987 to January 1988 (Gobert, 1989, cited in Rathier and Battaglya, 1994). By contrast, imports of conch into Martinique totalled 300 t in 1991 (Rathier and Battaglya, 1994), and requests for CITES permits to import a total of 800 t from Jamaica were received by French authorities in 1994. Imports during 1994 were also reported from the Bahamas (46.7 t), the Dominican Republic (15 t); St Vincent (11 t); Netherlands Antilles (7.5 t); and Turks and Caicos Islands (3.2 t). All trade was in the form of frozen meat with the shells removed. An additional 14 500 live specimens (500 kg) were imported from St Lucia in 1994 (Todisco, *in litt.*, 1995).

Illegal trade of Queen Conches to Martinique was noted by Appeldoorn (*in litt.*, to IUCN/SSC, 1991) and Nichols and Jennings-Clark (1994), the latter adding that illegal trade from St Lucia to Martinique poses problems for the former country's conch fishery. They explain that intrusions into local waters by French fishermen are common, and that it is likely that a significant percentage of St Lucia's conch harvest is sold at sea to these fishermen and taken directly to Martinique. The Queen Conch is also believed to be taken directly to Martinique from Venezuela.

Control of trade in the French Antilles and Netherlands Antilles is especially problematic owing to the presence of customs-free areas. Sybesma (*in litt.* to CITES Secretariat, 1995) commented that the Windward Islands of the Netherlands Antilles (i.e., all but Curaçao), were 'Customs-free islands', and therefore enforcement of existing regulations was virtually non-existent. They noted, however, that this situation may change in response to the stated goal of the Government of the Netherlands Antilles to increase controls on trade as well as Customs controls (in principle to reduce drug trafficking) and to increase negotiations with French authorities in this regard.

Further problems in implementing CITES trade controls are posed by the fact that the French Antilles are considered part of France, and therefore trade between these islands and the rest of the EU is considered 'internal', i.e., CITES export permits are not required to ship Queen Conches from these islands to countries within the EU. The Netherlands Antilles and Aruba are considered overseas territories of the Kingdom of the Netherlands, and are neither considered part of the EU nor covered by the Netherlands' accession to CITES. Although committing to do so as early as 1991 (van Kreveld *et al.*, 1993), the Government of the Netherlands Antilles has yet to join the Convention, and therefore trade to these islands may take place outside CITES trade controls, although some permit requirements have been implemented. Despite these limitations, the French Government reported some trade from the French Antilles in their CITES annual report, with the Government of the Netherlands Antilles also reporting trade from these islands to the CITES Secretariat, even though they are not a CITES Party.

**Honduras** The fishery is primarily commercial in nature, involving meat and some shells for export, although there is some domestic use as well. According to estimates based on data supplied by the commercial fishery, a total of 2173 t of Queen Conch meat was 'produced' from 1990-1994, of which 1901 t, or 87%, were for 'external sales', presumably export (Morales, *in litt.* to IUCN/SSC, 1995). US Bureau of Census data indicate that the USA is an important market for conch exports from Honduras; however, trade was not recorded in US CITES annual report data. In 1995, this country reported the export to the USA of over 260 t of Queen Conch meat (CITES annual reports were not provided for previous years).

**Jamaica** The large-scale commercial fishery for Queen Conches first developed during the late 1980s (Appeldoorn, *in litt.* to IUCN/SSC, 1991). Conch landings from Pedro Bank were estimated at approximately 800 t in 1990 (Appeldoorn, 1994a). It is believed that more than 2000 t of *S. gigas* meat were harvested from Pedro Bank during 1993. The meat, which was exported, probably represented in the order of 40% of all Queen Conches fished that year, with harvests being so large that the market for conches was flooded and prices dropped significantly (Appeldoorn, *in litt.* to IUCN/SSC, 1994).

The harvest off Pedro Bank during the 1993/1994 fishing year fell short of the quota set for that year of 3000 t (Goodbody, *in litt.* to CITES Secretariat, 1994). The tentative quota for the 1994/1995 fishing year was initially reduced by 50%, to 1500 t, then increased to 2000 t for this period, with a plan to reduce it by 100 t per year for the following five years (Campbell, *in litt.* to CITES Secretariat, 1995).

Much of the Queen Conch meat harvested in Jamaica appears to have been exported to Martinique and Guadeloupe (see above), with France's CITES annual report showing imports of approximately 250 000 'bodies' from Jamaica in 1993. Jamaica is not a CITES Party, and therefore annual reports from this country are not available for comparison. The USA is another important importer of conch meat from Jamaica, with US Bureau of Census data showing the import of over 2000 t from 1989-1994, of which 412 t was imported in 1994 alone. US imports from Jamaica were not reflected in US CITES annual report data.

**Turks and Caicos Islands** There has been a commercial conch fishery in the Turks and Caicos Islands since at least the beginning of this century. The fishery peaked at 904 t in 1985/1986 in response to demand for conch meat, primarily from the USA, and the switch from the traditional use of conch hooks to free diving from fast boats to harvest this species (Ninnes, 1994).

The Department of Environment and Coastal Resources, Ministry of Natural Resources (Ninnes, *in litt.* to IUCN/SSC, 1995) analysed catch per unit effort (CPUE) data for the Caicos Bank fishery for 1977-1993. Available data show that CPUE increased every year from 1988 to 1993, and apparently contradict the assessment in Ninnes (1994) that CPUE was low. Ninnes (*in litt.* to IUCN/SSC, 1995) calculates a maximum sustainable yield of 1 740 000 lbs (791 t) at 6300 boat days of fishing effort. Historical annual catches, which have been documented since 1904 in some parts of the islands, have rarely exceeded sustainable yield estimates, although Ninnes (1994) suggests that overfishing may have occurred in the recent past. A harvest quota of 570 000 lbs (259 t) of processed meat was set for 1993/1994, equivalent to 652 t of landed product, or some 3 562 500 individual conches (Ninnes, *in litt.* to IUCN/SSC, 1993).

With the introduction of CITES controls and restriction on exports from Haiti, exports of dried meat from the capital, Grand Turk, have increased, presumably to meet the demands of the Haitian community in the USA. Demand for conch shells for export has also increased recently.

Ninnes (*in litt.* to IUCN/SSC, 1995) reports that 40% (by weight) of commercially caught Queen Conch meat from the Turks and Caicos Islands are exported, the principal market being the USA, with smaller quantities (<9070 kg/year) going to France and reported in their annual report. Exports of Queen Conch meat from the Turks and Caicos were not reflected in US CITES annual reports for 1992 or 1993.

An export quota of 725 624 kg live weight, 34 014 kg dried meat and 3 000 000 shells produced as a byproduct of the meat fishery was established for 1995 (Anon., 1995). There is no evidence of illegal trade (Ninnes, *in litt.* to IUCN/SSC, 1995).

**USA** The USA is the largest import market for Queen Conch meat (Berg, *in litt.* to IUCN/SSC, 1991), the continental (south Florida) and territorial (Puerto Rico and the Virgin Islands) populations of *S. gigas* being too small to meet demand from tourists and a relatively large population of Caribbean descent. The USA was cited as the primary export destination for conches exported from Belize (Villanueva, *in litt.* to CITES Secretariat, 1995) and the Turks and Caicos (Ninnes, *in litt.* to IUCN/SSC, 1995), and an important market for conches exported from Jamaica and Honduras.

US Bureau of Census data show that conch imports reported to Customs increased markedly during the early 1990s, and totalled over 4000 t of meat from range states from 1989-1994 (Table 1). A further 135 986 kg of Queen Conch meat was seized by the US Fish and Wildlife Service during late 1994 and early 1995 owing to lack of CITES documentation and falsification of entry documents (Stansell, *in litt.* to CITES Secretariat, 1995).

Although US Bureau of Census data show that the USA is also an exporter of conch meat, these exports, mainly to Hong Kong and Singapore, are believed to represent whelk Buccinidae from the mid-Atlantic trawl fishery, and not conch meat (Daves, *in litt.*, 1996).

### External markets

As noted earlier, large volumes of Queen Conch meat are traded and consumed within the Caribbean. There is also evidence of trade to external markets, the most notable being Europe (France and the Netherlands) and Japan. Japan's CITES annual reports show the import of 11.6 t of shells and 20 856 items of meat from Jamaica and 51.4 t of meat from the Bahamas in 1994. CITES data for imports into France may reflect imports into the French Antilles, although the CITES Secretariat informed the CITES Animals Committee that huge volumes reportedly went to France (Anon., 1994). Records of trade to the Netherlands are absent, although shells are known to have been exported to this country from the Netherlands Antilles (Anon., 1994).

## Cultivation of the Queen Conch

Extensive research has been carried out over the past 10 years into methods of cultivation and the prospects of stock enhancement of *S. gigas*. Hatchery techniques are well established (Davis, 1994; Davis and Hesse, 1983) but survival of hatchery-reared juveniles released in the wild has been poor (Coulston *et al.*, 1989; Dalton, 1994). Enhancing stocks with hatchery releases will remain unfeasible until current research, which aims to identify the factors limiting outplanting successes, is completed (M. Congora, pers. comm. to R. Glazer, 1991; Glazer, 1991; Glazer and Berg, 1994). Despite progress, mariculture has yet to prove economically profitable (Berg, *in litt.* to IUCN/SSC, 1991). The Turks and Caicos Islands have a large Queen Conch farm where research has been undertaken for the last 12 years and production of 1 000 000 animals a year by 1997 is anticipated (Ninnes, *in litt.* to IUCN/SSC, 1995). Mexico is also involved in research into conch mariculture (Aranda and Desmarais, 1994).

## Conclusions and Recommendations

Overfishing to support the demand for Queen Conch meat is the major cause of a decline in numerous *S. gigas* populations throughout the species' range. International trade (both legal and illegal) helps drive this fishery by supplying Queen Conches to areas in which local populations are no longer able to meet demand.

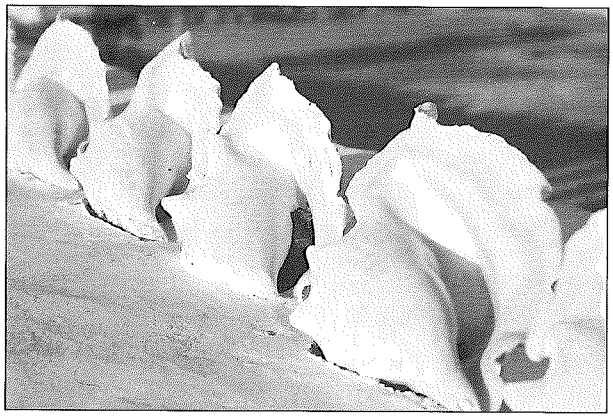
Although the Queen Conch is considered commercially threatened, the overall survival of the species does not appear to be at risk: deep waters are currently uneconomic to exploit and thus provide a refuge from fishing, although the use of SCUBA equipment to fish deeper water populations is on the increase. The species' large production of eggs and larvae has been interpreted as showing that it has a high reproductive potential. However, there is insufficient information regarding the role of adult populations, larval recruitment and habitat requirements to demonstrate that the species is secure, and some overexploited populations (e.g. Florida) have failed to recover despite protection. Appeldoorn (1994a) notes that identification of critical habitats for recruitment and juvenile growth and survival, as well as an understanding of the processes affecting populations within and between these habitats, is required. Such information will also support any further attempts at reintroduction of the Queen Conch.

Evidence of over-exploitation and illegal trade of Queen Conches demonstrates the need for more effective fishery management programmes and trade controls in addition to habitat conservation measures. Suggested mechanisms for controlling harvest include closed seasons, restrictions on the use of SCUBA equipment in conch fisheries (to protect deep water populations), establishment of minimum size restrictions (to protect juveniles), establishment of harvest quotas, and limits on total fishing effort. Owing to the likelihood that many local fisheries are dependent on the well-being of stocks under the jurisdiction of other countries, Glazer (1991) contended that a regional or Caribbean-wide management strategy may be valid for *S. gigas*. Both the SPAW Protocol and OECS fisheries controls would appear to provide opportunities for the development of such regional management plans, although Appeldoorn (1994a) contends that effective management may be more easily approached at the local level. Beets and Appeldoorn (1994) stress that management strategies must also take into account the needs and experience of local fishermen, and be designed to 'work with the fishermen, not against them'.

It is clear, however, that establishing fisheries and trade controls alone is insufficient to bring harvest and trade within sustainable levels. Appeldoorn (*in litt.* to IUCN/SSC, 1991; 1994a) notes that lack of effective enforcement of fisheries regulations is a 'universal problem'. He adds that consumer nations can play a role in fostering resource management. CITES clearly provides an opportunity to assist in this regard. At present, however, large-scale trade in Queen Conches is being conducted outside CITES trade controls despite the listing of this species in CITES Appendix II since 1992. Implementation of CITES controls is impeded by the fact that several important range states have not yet acceded to the Convention. Within CITES Parties, ineffective communication between government personnel responsible for CITES and those responsible for monitoring import and export of fisheries products is also likely to be a factor resulting in poor implementation.

Most Queen Conches are traded in the form of meat, a fisheries product that has not traditionally been subject to CITES controls other than for giant clams Tridacnidae and some crocodilians. Port inspectors charged with enforcement of CITES may simply be ignorant of the fact that the meat of this species is being traded internationally in large volumes, and/or be unable to distinguish between Queen Conch meat and that of other mollusc species. Fisheries and health inspectors may similarly be unaware that CITES export permits are required for the trade in this species, and therefore may not inform officials responsible for CITES implementation when shipments are presented for import. It seems likely that many traders may also be ignorant of CITES requirements.

Further training will need to be provided if CITES is to serve as an effective means of controlling trade in Queen Conch meat and shells, and perhaps other fisheries products in future. To fail to implement such controls will serve not only to undermine conservation programmes for this species, but also to undermine the Convention.



© *S. Wells*

**Queen Conches *Strombus gigas*, Turks and Caicos Islands.**

## Acknowledgements

The author would like to acknowledge the contributions of the Cambridge-based staff of the IUCN Species Survival Commission, who were partners in the compilation of data on *Strombus gigas* in the preparation of the CITES significant trade review. Special thanks are due to Alison Rosser in this regard.

## References


Anon. (1992). *Analyses of Proposals to Amend the CITES Appendices.* IUCN Species Survival Commission, TRAFFIC and World Conservation Monitoring Centre. Cambridge and Gland. Pp.165-171.

Anon. (1994). Tenth Meeting of the CITES Animals Committee. Draft Summary Record.

Anon. (1995a). *Draft Fishery Management Plan for the Queen Conch Resources of Puerto Rico and the United States Virgin Islands.* Caribbean Fishery Management Council. Puerto Rico.

Anon. (1995b). CITES Secretariat Notification to the Parties, No. 862, 18 May.

Anon. (1996). *Review of Significant Trade in Animal Species Included in CITES Appendix II.* Detailed reviews of 24 priority species. Report to the CITES Animals Committee. IUCN - The World Conservation Union Species Survival Commission, TRAFFIC Network and World Conservation Monitoring Centre. Cambridge, UK.

Appeldoorn, R.S. (1988). Ontogenetic changes in natural mortality rate of Queen Conch, *Strombus gigas* (Mollusca: Mesogastropoda). *Bulletin of Marine Science* 42(2):149-165.

Appeldoorn, R.S. (1991). History and recent status of the Puerto Rican conch fishery. In: Waugh, G.T. and Goodwin, M.H. (Eds). *Proceedings of the 40th Annual Gulf and Caribbean Fisheries Institute.* Pp.267-282.

Appeldoorn, R.S. (1994a). Queen Conch management and research: status, needs and priorities. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.301-320.

Appeldoorn, R.S. (1994b). Spatial variability in the morphology of Queen Conch and its implication for management regulations. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Pp.145-158.

Aranda, D.A. and Desmarais, T.B. (1994). Estado actual de la pesquería, del cultivo y programa de investigación del caracol *Strombus gigas* en México. In: Appeldoorn, R. S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.97-112.

Beets, J. and Appeldoorn, R.S. (1994). Queen Conch management in the U.S. Virgin Islands. In: Appeldoorn, R. S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.61-66.

Berg, C.J., Jr. (1976). Growth of the Queen Conch *Strombus gigas*, with a discussion of the practicality of its mariculture. *Marine Biology* (Berlin) 34:191-199.

Berg, C.J., Jr. (1987). Current status of conch fisheries in the Caribbean and exports to the United States. *Proceedings of the 38th Annual Gulf and Caribbean Fisheries Institute.* Pp.293.

Berg, C.J., Jr., Couper, F., Nisbet, K. and Ward, J. (1992a). Stock assessment of Queen Conch, *Strombus gigas* and Harbour Conch, *S. costatus*, in Bermuda. *Proceedings of the 41st Annual Gulf and Caribbean Fisheries Institute.* Pp.433-438.

Berg, C. J., Jr. and Glazer, R. G. (1990). Stock assessment of a large marine gastropod (*Strombus gigas*) using randomized and stratified towed-diver censusing. *Rapp, P.-v. Reun. Cons. Int. Explor. Mer.*

Berg, C.J., Jr., and Olsen., D.A. (1989). Conservation and management of Queen Conch (*Strombus gigas*) fisheries in the Caribbean. In: Caddy, J.F. (Ed.). *Marine Invertebrate Fisheries: their Assessment and Management.* John Wiley and Sons. New York. Pp.421-442.

Brownell, W.N. and Stevely, J.M. (1981). The biology, fisheries, and management of the Queen Conch, *Strombus gigas. Marine Fisheries Review* 43(7):1-12.

Campton, D.E., Berg, C.J., Jr., Robison, L.M. and Glazer, R.A. (in press). Genetic patchiness among populations of Queen Conch (*Strombus gigas*) in the Florida Keys and Bimini. *Fishery Bulletin.*

Coulston, M.L., Berey, R.A., Dempsey, A.C. and Odum, P. (1989). Assessment of the Queen Conch (*Strombus gigas*) population and predation studies of hatchery reared juveniles in Salt River Canyon, St. Croix, V.I. *Proceedings of the 38th Annual Gulf and Caribbean Fisheries Institute.* Pp.294-305.

Dalton, A. (1994). Mariculture techniques for Queen Conch (*Strombus gigas* L.): development of nursery and growout techniques. In: Appeldoorn, R.S. and Rodgriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp. 253-260.

Davis, M. (1994). Mariculture techniques for Queen Conch (*Strombus gigas* L.): egg mass to juvenile stage. In: Appeldoorn, R.S. and Rodgriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.231-252.

Davis, M. and Hesse, C. (1983). Third world level conch mariculture in the Turks and Caicos. *Proceedings of the 35th Annual Gulf and Caribbean Fisheries Institute* 35:73-82.

Davis, M., Mitchell, B.A. and Brown, J.L. (1984). Breeding behaviour of the Queen Conch, *Strombus gigas* Linne, held in a natural environment. *Journal of Shellfish Research* 4(1):17-21.

FAO (1994). *FAO Yearbook. Fishery Statistics: Catches and Landings Vol 74.* Food and Agriculture Organization of the United Nations, Rome.

Ferrer, L.T. and Alcolado, P.M. (1994). Panorámica actual del *Strombus gigas* en Cuba. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.73-79.

Glazer, R. (1991). Inclusion of *Strombus gigas* in Appendix II of CITES. A Proposal Review. Submitted to the IUCN/SSC Trade Specialist Group. 15pp.

Glazer, R.A. and Berg, C.J., Jr. (1994). Queen Conch research in Florida: an overview. In: Appeldoorn, R.S. and B. Rodriguez (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.79-98.

Hesse, K.O. (1979). Movement and migrations of the Queen Conch, *Strombus gigas* in the Turks and Caicos Islands. *Underwater Naturalist* 10(3):4-9.

Higgs, C. (1987). Current status of Queen Conch (*Strombus gigas*) stocks and fisheries regulations in the Bahamas. In: Williams, F. (Ed.). *Proceedings of the 38th Annual Gulf and Fisheries Institute.* Pp.377.

Mora, O. (1994). Análisis de la pesquería del caracol pala (*Strombus gigas* L.) en Colombia. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp. 137-144.

Munoz, L., Alcolada, P., Fraga, I. and Llorente, P. (1987). Status of populations and fisheries of *Strombus gigas* in Cuba, with some results of juvenile rearing in pens. In: Williams, F. (Ed.). *Proceedings of the 38th Annual Gulf and Fisheries Institute.* Pp.353-361.

Nichols, C. and Jennings-Clark, S. (1994). An overview of the conch industry in St Lucia, West Indies. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.25-28.

Ninnes, C. (1994). A review on Turks and Caicos fisheries for *Strombus gigas* L. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.67-72.

Rathier, I. and Battaglya, A. (1994). Assessment of the Martinique Queen Conch fishery and management perspectives. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.29-50.

Rodríguez Gil, L.A. (1994). Análisis de la evolución de la pesquería del caracol en dos estados de la Península de Yucatán, México y en una cooperativa de pescadores. In: Appeldoorn, R.S. and Rodriguez, B. (Eds). Strombus gigas. *Queen Conch Biology, Fisheries and Mariculture.* Fundación Científica Los Roques, Caracas, Venezuela. Pp.113-124.

Stevely, J.M. (1981). Current status of Queen Conch fisheries. In: Berg, C.J., (Ed.). *Proceedings - Queen Conch Fisheries and Mariculture Meeting.* Wallace Groves Aquaculture Foundation, Freeport, Bahamas. Pp.6-8.

Stoner, A.W. and Ray, M. (1993). Aggregation dynamics in juvenile queen conch: population structure, growth, mortality and migration. *Marine Biology* 116:571-582.


*Teresa A. Mulliken, Programme Officer, TRAFFIC International*

# EUROPE

## BELGIUM

The vast number of wildlife specimens seized from the UK residence of a Dutch taxidermist, in August 1995 (*TRAFFIC Bulletin*, 15(3):116), prompted Belgian authorities 10 days later to seize a further stockpile of dead animals - skins, skulls and stuffed specimens - from his property in Dessel. Investigators compiled a preliminary list, including 300 to 500 skins; 700 to 900 skulls, over 100 deep frozen animals, and a number of other specimens. Species represented in the collection included Gorilla *Gorilla gorilla*, Chimpanzee *Pan troglodytes*, Bonobo *Pan paniscus*, Orang-utan *Pongo pygmaeus*, Snow Leopard *Uncia uncia*, Tiger *Panthera tigris*, Ocelot *Leopardus pardalis*, rhino species, and Hyacinth Macaw *Anodorhynchus hyacinthinus* (all App. I).

The suspect awaits trial. The investigation was conducted by the Belgian Ministry of Agriculture, Customs and Excise and TRAFFIC.

*TRAFFIC Europe; WWF International News Release, 28 August 1995*

© Dr L. Greenbaum, The Orangutan Foundation Taiwan

**Female Orang-utan *Pongo pygmaeus* (App. I) with infant.**

## CZECH REPUBLIC

On 18 October 1995, Customs officers at Prague airport seized 2 Palm Cockatoos *Probosciger aterrimus* (App. I) which had been transported from Bangkok, Thailand, by a private Czech firm. The birds had been declared as chickens and no CITES export permits had been issued, nor were there any covering veterinary certificates. They had been packed in cartons that did not conform to IATA regulations. The case is being investigated by the Czech Inspection for the Environment; Prague Zoo is caring for the birds.

*IUCN Czech Project Co-ordination Unit*

## GERMANY

In late 1995, German Customs authorities carried out raids on traditional Chinese medicine (TCM) outlets in eight cities to search for ingredients comprising illegal wildlife; information leading to the raids was based on research undertaken by WWF-Germany and TRAFFIC.

On 15 November, 12 shops in Bad Reichenhall, Cologne, Düsseldorf, Hamburg and Munich were visited, and more than 5000 products which claimed, illegally, to contain parts of CITES-listed species were seized. Apart from not being covered by the requisite CITES permits (in the case of Appendix II-listed species), the products had not been registered with the Ministry of Health, according to stipulations for imported pharmaceuticals. Forensic examination of the products is currently underway in the USA.

Information seized at this time on the identity of major importers of these products led to further raids of TCM outlets in Chemnitz, Dresden and Hanover. The objective of these searches was to obtain data on trade and commercial contacts. No items were seized.

---

On 20 November 1995, Customs officers seized 34 hummingbirds Trochilidae (App. II) from the home of a German citizen who had reportedly acquired the birds in Brazil, French Guiana and Jamaica. Videos and photographs of the collecting trips, recording methods of capture, smuggling and the names of the intended recipients of the birds in Germany, were also found.

The hummingbirds are in the care of a zoological garden and are in good condition. The case is being investigated.

---

On 27 November 1995, Customs officers at Passau, on the Czech border, confiscated 109 juvenile snakes (2 D'Alberts Pythons *Morelia albertisii*, 2 Rock Pythons *M. amethistinus*, 1 Water Python *M. mackloti*, 101 Green Tree Pythons *M. viridis* and 3 Timor Pythons *Python timoriensis*), and 25 juvenile monitor lizards (8 Pacific Monitors *Varanus indicus*, 6 Sepik Monitors *V. jobiensis*, 2 Papuan Monitors *V. salvadorii* and 9 Timor Tree Monitors *V. timorensis*). All the reptiles, which are listed in Appendix II, had been wild-collected. They had been smuggled from Indonesia and transported from Prague, Czech Republic, concealed in the seats and bodywork of a car. Three German citizens have been charged with the offence. The animals are being housed at a zoological collection in Germany and the case is under investigation.

*TRAFFIC Europe; CITES Management Authority, Germany*

## ITALY

Illegal shipments of a large number of African Grey Parrots *Psittacus erithacus* (and other birds) have been uncovered in recent months at Fiumicino airport, in transit from Nigeria.

On 5 August 1995, the Forest Corps and Customs officials seized 40 Grey Parrots in a shipment containing 373 live birds which also included 23 Red-headed Lovebirds *Agapornis pullarius*, 10 Senegal Parrots *Poicephalus senegalus* (all App. II), as well as birds listed in Appendix III by Ghana and therefore requiring country of origin certificates: Yellow-fronted Canaries *Serinus mozambicus*, Red-billed Fire-finches *Lagonosticta senegala*, Red Bishops *Euplectes orix*, Red-cheeked Cordonbleus *Uraeginthus bengalus* and Village Indigobirds *Vidua chalybeata*. No permits covered the shipment, which was destined for Kuwait. The birds are being housed at Rome Zoo.

On 16 November 1995, a further consignment of 49 Grey Parrots, not covered by a permit, 15 Rose-ringed Parakeets *Psittacula krameri* and 60 Yellow-fronted Canaries, was seized. These birds, which were also bound for Kuwait, are being cared for by a private zoo.

On 17 December 1995, 32 Grey Parrots contained in the luggage of two Nigerian women, in transit from Lagos to Bombay, India, were seized. The birds are in the care of a private zoo.

All cases are under investigation.

*TRAFFIC Europe*

## UK

A number of people have been prosecuted following their arrest during police raids of traditional Chinese medicine (TCM) outlets in February 1995 (*TRAFFIC Bulletin*, 15(2):52). The aim of the ongoing investigation, known as "Operation Charm", is to halt the sale of ingredients derived from protected species, which is illegal under domestic legislation COTES (Control of Trade in Endangered Species); an item being offered for sale which purports to contain such ingredients is also illegal in the UK. The raids were initiated following the findings of an investigation undertaken by TRAFFIC International.

On 31 August 1995, at Birmingham Magistrates' Court, Tuong Long, an acupuncturist, pleaded guilty to charges of displaying for sale Tiger *Panthera tigris* (App. I) bones and plasters allegedly containing Tiger bone, and medicine which claimed to contain rhino (App I) horn. The items were found in boxes stored at a warehouse. Long, who reportedly had been selling the products over a two-year period for use in TCM, was fined £1000 (US$1600). He was told that the penalty would have been higher had the court believed he was engaged in a major business of importing and displaying the items for sale.

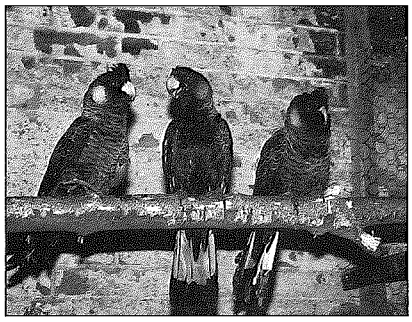
At least a further six individuals arrested in February have been prosecuted, receiving fines ranging from between £60 and £3000. Prosecution of one Chinese herbalist, on 6 September, resulted in a fine of £3000 after he admitted to six offences of offering for sale Tiger bones, rhino horn and/or medicines claiming to contain endangered species. A second Chinese herbalist was fined £2000 after admitting to four similar offences.

A second investigation, codenamed "Operation Charm II" resulted in a police raid on a west London warehouse on 30 November. Items seized included several hundred packets of TCM purporting to contain Tiger bone, rhino horn, Saiga Antelope *Saiga tatarica* (App. II) horn, pangolin *Manis* (App. I/II) and tortoiseshell (App. I); several hundred packets of "Peaceful Tea" which claimed in Chinese to contain both rhino horn and Saiga Antelope horn, as well as bags of American Ginseng *Panax quinquefolius* (App. II) and boxes of dried orchid *Dendrobium* (App. II) roots were also seized.

On 20 December 1995, officers of the CITES Enforcement Team at Heathrow airport seized a consignment of 309 preserved birdwing butterflies *Troides aeaces* (App. II;EU/C2) which had been sent by post, from Bangkok, Thailand, to Warsaw, Poland.

---

On 7 January 1996, 50 live Red-footed Tortoises *Geochelone carbonaria* (App. II) were seized at Gatwick airport, following their arrival from Barbados without documentation, on route to Japan. Following agreement with the UK Management Authority, the tortoises were returned to Barbados.



© C. Allan/TRAFFIC

**Specimens of White-tailed Black-Cockatoos *Calyptorhynchus baudinii* (App. II), smuggled from Australia as eggs and reared in Wales, UK.**

On 7 January 1996, at Swansea Crown Court, Wales, Alan Griffiths of Llandysul was charged with conspiracy to import 29 cockatoo eggs from Australia (*TRAFFIC Bulletin*, 15(2):92-93). With very few exceptions, the collection and export of wildlife from Australia is prohibited.

Griffiths, a retired vet, had recruited Terence Owen, of Llanybydder, also charged, to smuggle eggs from Australia to Wales, via Heathrow airport. Owen engaged the assistance of his son, Christopher and daughters, Denise Owen and Nicola Roderick, to collect the eggs from one William Grumball in Australia. The eggs were carried back in specially adapted underwear worn by the smugglers, incubated and hatched at the home of David Farmer, of Haverfordwest, and subsequently reared by Griffiths. The operation was foiled when Customs officers at Perth airport, acting on information provided by TRAFFIC, apprehended Christopher Owen as he returned to the UK with 29 eggs, in October 1994. He was later gaoled for six months (*TRAFFIC Bulletin*, 15(2):92-94). The ensuing investigation by the Australian and UK Customs authorities into the smuggling ring, assisted by information provided by TRAFFIC, led to the arrest of Griffiths and his collaborators.

Griffiths was sentenced to eight months' imprisonment, had £29 000 (US$46 500) confiscated by the Crown and was ordered to pay £2500 prosecution costs. Terence Owen was sentenced to gaol for two months (but released after serving one month), and his daughters ordered to carry out 200 hours community service. Farmer was gaoled for six weeks. (Grumball was sentenced to 18 months' imprisonment in Australia in March 1995 for conspiracy to export eggs illegally.)

The eggs involved were mainly of Red-tailed Black-Cockatoos *Calyptorhynchus banksii*, White-tailed Black-Cockatoos *C. baudinii* and a Yellow-tailed Black Cockatoo *C. funereus* (all App. II).

*TRAFFIC International; CITES Enforcement Team, HM Customs and Excise, Heathrow, UK*

---

# ASIA

## HONG KONG

On 10 November 1995, the owner of a medicinal shop was fined HK$500 000 (US$66 500) for offering for sale medicines claiming to contain Tiger *Panthera tigris* (App. I) ingredients; these items were reportedly manufactured in China. It is the heaviest fine ever imposed in the province for such an offence, and follows recently increased penalties - up to HK$5 million fine and two years' imprisonment - aimed at stamping out the sale of substances that contain or claim to contain parts of protected animals. Any person in possession of medicine claiming to contain Tiger ingredients which is not covered by a licence issued by the Agriculture and Fisheries Department (AFD) faces prosecution under section 6(3) of the *Animals and Plants (Protection of Endangered Species) Ordinance, Cap. 187.*

---

On 16 November 1995, the AFD seized 115 kg of musk *Moschus* (App. I/II) grain and pods in a raid on a shop in Western district; the musk was not covered by a valid licence. This is the largest single seizure of musk the department has made. The shop is believed to have been a major distributor of musk in the territory. The offender is liable to a maximum penalty of HK$500 000 fine and one year's imprisonment upon conviction of this offence. Investigations into the case are in progress.

---

On 14/15 December 1995, the AFD raided two market stalls in Kowloon; in the first incident officials seized 2 paws of the Asiatic Black Bear *Ursus thibetanus* (App. I), 3 live giant salamanders *Andrias* (App. I) and 2 pangolin *Manis* (App. II) carcasses; in the second case, 1 live pangolin, 1 live giant salamander, 5 live owls, and the carcasses of 3 otters, 2 pangolins and 1.6 kg of pangolin scales were seized. Investigations are being conducted. Subject to their condition, the live animals were to be released in the wild or kept in a rescue centre.

*Agriculture and Fisheries Department (AFD) Press Releases (Hong Kong), 10/17 November/18 December 1995; AFD* in litt. *to TRAFFIC East Asia, 18/19 December 1995*

## INDIA

On 9/10 October 1995, a joint operation between TRAFFIC India, the Deputy Director, Wildlife Preservation (Northern Region) and the Divisional Forest Officer of Agra, resulted in seizures from a well-known trader in Agra, who was arrested. Items included 1 Tiger *Panthera tigris* (App. I) skin, 1 Leopard *Panthera pardus* (App. I) skin, 10 kg Tiger bone and 6 kg Leopard bones. Interrogation of the trader led the investigators to Sawai Madhopur, in Uttar Pradesh, where, with the assistance of the Field Director of Ranthambhor Tiger Reserve, they seized 4 Leopard skins, 9.5 kg Leopard bones and the claws of 2 Tigers; a dealer was arrested.

---

On 12 December 1995, the Divisional Forest Officer in Varansi, in collaboration with the Directorate of Revenue Intelligence, seized 402 pieces of carved elephant (App. I) ivory and 6 kg of raw ivory from a man reported to be one of the biggest ivory traders in northern India. During interrogation following his arrest, the trader maintained that the ivory was from pre-ban stocks. The case is under investigation.

---

On 23 December 1995, acting on information provided by TRAFFIC, the Deputy Director of Wildlife Preservation in Delhi seized 172 shawls made from the wool (known as shahtoosh) of the Tibetan Antelope *Pantholops hodgsoni* (App. I). Up to three animals may be killed and their wool shorn to produce one pure shahtoosh shawl. The confiscated garments are thought to comprise specimens woven from pure shahtoosh as well as a mixture of shahtoosh and wool of the pashmina goat. One person was arrested.

The Tibetan Antelope is listed in Schedule I of India's *Wildlife (Protection) Act*, which prohibits hunting and trade in this species; anyone trading illegally in parts and products of the animal, or found in possession of such items, may be liable to imprisonment for up to seven years and fined a minimum of Rs5000 (US$155). The Tibetan Antelope is also protected by law in China.

*TRAFFIC India; TRAFFIC International; WWF India*

## JAPAN

On 12 September 1995, police confiscated some 6 tonnes of whale meat from a Japanese driftnet ship in Kesennuma port, northern Japan. The case has been referred to the Kesennuma Prosecutor's Office to determine whether the suspects should stand trial. This is the first time in this country that such a referral has been made in relation to illegal whale hunting.

The authorities have disposed of the meat and are investigating the case. According to the findings of the police, the meat was of a Sperm Whale *Physeter macrocephalus* (App. I) that had been caught in the Pacific Ocean, 300 km off the coast of Japan.

---

On 1 November 1995, the Tokyo Metropolitan Police Department arrested a pet shop dealer on suspicion of selling over 90 Egyptian Tortoises *Testudo kleinmanni* (App. I) to eight pet shops, without having registered the animals. The specimens had been included in three consignments containing a total of 300 Egyptian Tortoises that had been imported from Egypt between October 1994 and 14 February 1995, prior to the Appendix I-listing of this species coming into force on 15 February 1995. ctd...

The incident violated the *Law on the Conservation of Endangered Species of Wild Fauna and Flora* which regulates CITES. In Japan, Appendix I-listed specimens must be registered if they are to be traded legally within the country.

According to the suspects, 148 specimens had died before the police investigation was made and 93 had been sold. Police confiscated 59 specimens and the incident has been reported to the Public Prosecutor's Office.

*TRAFFIC East Asia; Sanriku Shinpo (Japan), 13 September 1995/6 February 1996*

### NEPAL

On 5 September 1995, police searched a bus at Dumrah checkpoint, Kathmandu, and found a 25 cm-long rhino (App. I) horn, weighing 500 g, concealed in a bag. Two men were arrested. The horn had reportedly been obtained from an employee of the forest department in Chitwan National Park; subsequently this person was also arrested. The case is under investigation.

---

On 16 September 1995, police seized 38 musk *Moschus* (App. I) pods, weighing a total of 340 g. The items were being carried in a bag by a man at Jhorpokri market in Soumang; a further three people were arrested in connection with the incident and all are in custody in Panchthar gaol. The musk had allegedly been obtained in the mountains of Taplejung District and was being taken to Kathmandu from where it was to be sent to India. The case is under investigation.

---

On 24 September 1995, in Rasuwah, Galang District, forestry officials arrested two men in possession of 8 fresh musk pods, 64 bear gall bladders, 7 of which were fresh, a packet of zinc sulphate poison and a silk musk deer trap.

---

On 28 September 1995, a tip-off from an informer prompted the police and the Department of National Parks & Wildlife Conservation to carry out a raid on the house of an animal dealer - an Indian national - in Bagh Bazar, Kathmandu. They discovered 3 Clouded Leopards *Neofelis nebulosa* (App. I) and 1 Leopard *Panthera pardus* (App. I), all alive. The dealer, who is in custody, claims that the animals had been brought into Nepal from Patna, India, via the Nepalese border city of Malangawa. It is suspected that the animals were to be sold for export to China. They are being housed at Central Zoo and the case, the first in Nepal involving the seizure of live wild cats, is under investigation.

*Kantipur (Nepal), 6/20/25 September/14 October 1995; Narendra M.B. Pradhan, Department of National Parks and Wildlife Conservation, Kathmandu, Nepal,* in litt., *14 February 1996; The Kathmandu Post (Nepal), 29 September 1995; Gorkhapatra Daily, 29 September 1995*

### TAIWAN

On 17 August 1995, the Investigation Bureau of the Ministry of Justice seized 21 stuffed Hawksbill Turtles *Eretmochelys imbricata* (App. I), 78 ivory pieces and 9 Tiger teeth from furniture shops in Chiayi; the items had been imported from mainland China.

On 4 October 1995, law enforcement officers apprehended a man at Hsiaokang International airport, Kaohsiung, on suspicion of drug smuggling. In addition to large amounts of heroin, 8 ivory tusks were found in his luggage following his arrival from Thailand; a police officer travelling with him was also arrested, although it is not known whether he was involved in the attempted illegal import. A third man was arrested in Santuo district in connection with the incident. The case is under investigation.

---

On 7 November 1995, law enforcement officers seized unconfirmed numbers of ivory and rhino (App. I) horn articles, and arrested 3 people. The arrests came after months of investigation, in an operation requiring more than 40 investigators from Tainan, Taipei and Chiayi Counties. The articles reportedly had been purchased in Hong Kong, smuggled to Taiwan and stored at the home of one of the defendants; the intention had been to sell the items at one of the numerous jade markets on the island. An investigation is in progress.

---

On 11 January 1996, police officers and staff of the Wildlife Protection Unit of the Council of Agriculture seized 12 tonnes of dolphin and whale meat from a refrigerated warehouse in Peikang Township in Yunlin County. They arrested Wu Wan-chiao who, on 30 December 1995, had been caught at his home in the process of butchering four dolphin carcasses.

Wu has told police that he bought the dolphins at NT$1500 and NT$3000 (US$55-US$110) each and sold the meat at between NT$332 and NT$500 a kg. The killing and sale of dolphins and whales is illegal under the *Wild Animal Protection Act.* In view of the large amounts seized, police believe that others are involved in this operation and they are carrying out further investigations.

*United Daily News (Taiwan), 19 August 1995; China Post (Taiwan), 5 October/9 November 1995/13 January 1996; China News (Taiwan), 26 January 1996*

### THAILAND

On 16 July 1995, Mr Ken Zusuki, a Japanese national, was found guilty of attempting to export 38 orchid plants (App. II) without a permit, in contravention of the *Plant Act (No. 2) BE 2535. 1992.* He was fined 2000 Baht (US$85) and sentenced to one month's imprisonment, suspended for one year.

On 23 August 1995, Mr Chong Fai Ah, a Singaporean citizen, pleaded guilty to attempting to export 100 orchid plants (App. II) without a permit. He was fined 1000 Baht.

*Plant Introduction and Conservation of Wild Flora Sub-Division, Department of Agriculture, Thailand,* in litt., *28 September 1995*

## AMERICAS

### CANADA

On 16 November 1995, Song Ho Kim was found guilty of 11 counts relating to the illegal purchases of bears and bear parts. The case began in 1990 after taxidermists informed police that Kim had offered large sums of money for whole bears and bear parts. Subsequently, the defendant purchased several bear paws and gall bladders from undercover police posing as traders. Kim will stand trial in early 1996.

*Bear Watch*

### FRENCH GUIANA

On 22 September 1995, Customs officials at Cayenne-Rochambeau airport, seized a large number of amphibians and reptiles from the luggage of two German nationals. Species included 274 Dyeing Poison-arrow Frogs *Dendrobates tinctorius* (App. II), 130 *Atelopus flavescens*, 2 Giant Toads

© Mike Corley/WWF-UK

**Three Clouded Leopards *Neofelis nebulosa* (App. I) were recently seized in Kathmandu, the first case in Nepal involving the seizure of live wild cats.**

*Bufo marinus* and 1 *B. margaritifer*, some 60 lizards: *Gonatodes annularis*, *G. humeralis*, *Anolis chrysolepis*, Spiny-headed Tree Lizard *Plica plica and* Stilts-walk Lizard *P. umbra*; and 7 snakes: *Bothrops atrox*, *Xenodon rabdocephalus*, *Thamnodynastes* spp., *Dendrophidion dendrophis;* and, 1 trap-door spider *Avicularia metallica*. Intra-EU movement of *Dendrobates* spp. must be supported by CITES permits. The other species in the consignment are considered to be threatened in French Guiana and are protected in that country.

Following identification, the specimens were returned to the wild. The German nationals were gaoled and legal proceedings are in progress.

Twelve poison-arrow frogs were seized at this airport in October 1993 from a German national travelling to Paris (*TRAFFIC Bulletin*, 14(2):78).

*WWF-France Press Release, 6 October 1995*

**USA**

On 6 September 1995, US Customs officials at Los Angeles International airport seized 5 kg of bear bile and undisclosed amounts of musk *Moschus* deer pods, rhino horn pills and Tiger *Panthera tigris* bone plasters from four Chinese nationals. Gao Zhongri, Jin Yongzhe, Jin Xianglu and Li Songyue were arrested and charged with 10 counts of smuggling, unlawful wildlife importation and violations of the *Endangered Species Act*. One of the defendants was reported to have been carrying 57 phials of dried bear bile in boxes labelled "ginseng" contained in his suitcase.

All pleaded guilty to one misdemeanour. Gao Zhonri was sentenced to one year's imprisonment and Jin Xianglu to eight months. The other two have been released having served time.

---

On 12 September 1995, a shipment of 45 bear gall bladders was seized at Anchorage airport, Alaska; the animal parts had been concealed in a commercial shipment of reindeer antlers that had been ranched on a farm in Khabarovsk, in the Russian Far East.

On 25 September, a further shipment of 60 dried bear gall bladders were found at the airport hidden in a legal shipment of 2 tonnes of deer antlers, contained in 87 boxes. The shipment had reportedly come from Magadan, in the Russian Far East, and was bound for Los Angeles. It is recorded to be the largest-ever shipment to date from Russia to have been seized in Anchorage. The gall bladders, believed to derive from Brown Bears *Ursus arctos* (App. II), weighed 410 g-825 g each.

According to a spokesperson of the US Fish and Wildlife Service, Alaska receives reindeer antler shipments from Russia on a regular basis, most of which are intended for re-export to Korea.

---

On 25 October 1995, John Kemner of Dripping Springs, Texas, was charged under the US *Lacey Act* with importing 30 000 butterflies, moths and beetles from Mexico, where they had been collected without the requisite permits. Kemner, who has discovered 25 new species of butterflies in Oaxaca, Mexico, pleaded guilty to a misdemeanour and was fined US$500 and placed on three years' probation, during which time he is forbidden to collect butterflies or accompany another butterfly collector.



**Tiger Swallowtail *Papilio glaucus***

Kemner sold one specimen for US$1000 and kept about 15 000 specimens - he reportedly donated or sold the remaining insects to collectors and museums for between US$0.75-US$200 each. He claims never to have made a profit because of his shipping expenses.

---

On 12 December 1995, William Arthur Wegner of La Jolla, California, and Brian T. Bradley of New Paltz, New York, were sentenced by a Los Angeles federal grand jury to imprisonment for 5 years' and 41 months', respectively, for masterminding a wild bird egg smuggling ring.

The pair had previously pleaded guilty to conspiracy charges for their leadership of an operation carried out over a period of nine years, during which time more than 700 eggs of protected cockatoos were illegally collected from the wild in Australia and smuggled to the USA in specially designed vests. The eggs were hatched, reared and sold to collectors as captive bred parent birds, and included Galah *Eolophus roseicapillus*, Sulphur-crested Cockatoo *Cacatua galerita*, Pink Cockatoo, *C. leadbeateri*, Red-tailed Black-Cockatoo *Calyptorhynchus banksii*, White-tailed Black-Cockatoo *C. baudinii* and Slender-billed Black-Cockatoo *C. latirostris* (all App. II).

A further 13 individuals have been convicted for their part in the smuggling scheme. The investigation was carried out by the Special Operations Branch of the US Fish and Wildlife Service.

---

On 30 January, in the the Northern District Court of Illinois, Tony Silva pleaded guilty to conspiracy to smuggle protected birds into the USA between 1986 and 1991 (*TRAFFIC Bulletin*, 15(2):95). Silva admitted that in 1989 he purchased a "substantial number" of wild-caught Hyacinth Macaws *Anodorhynchus hyacinthinus* (App. I) from co-defendant Gisela Caseres and paid her to hold the birds in Paraguay; another co-defendant, Hector Ugalde, had been responsible for smuggling the specimens into the USA. Silva also admitted to being involved, in 1986, in successful efforts to smuggle Crimson-bellied Parakeets *Pyrrhura rhodogaster* (App. II), Golden Parakeets *Aratinga guarouba*, Yellow-shouldered Parrots *Amazona barbadensis*, Vinaceous Parrots *A. vinacea*, Blue-throated Parakeets *Pyrrhura cruentata* (all App. I) and other Hyacinth Macaws out of South America to the USA. He also pleaded guilty to wilfully under-reporting his income.

Silva's mother, Gila Daoud, pleaded guilty to one felony count of assisting Silva in the filing of a false income tax return and, in a plea agreement, admitted to conspiring in the scheme to smuggle Hyacinth Macaws and other protected wildlife.

In January 1995, Ugalde pleaded guilty to conspiracy to smuggle Hyacinth Macaws into the USA. He has co-operated with the Government's investigation and awaits sentencing. Caseres, a Paraguayan national, has not been apprehended.

The case was investigated by the Special Operations Branch of the US Fish and Wildlife Service and the Internal Revenue Service's Criminal Investigation Division.

*TRAFFIC USA; International Primate Protection League; TRAFFIC Europe; TRAFFIC USA*, in litt. *to TRAFFIC Europe, 27 September 1995; US Fish & Wildlife Service Press Release, 13 December 1995; US Department of Justice Press Release, 30 January 1996*

# The Trade in Tortoise-derived Souvenir Products in Morocco

*A.C. Highfield and J.R. Bayley*

## Introduction

Morocco was formerly the major source of Spur-thighed Tortoises *Testudo graeca* for the European pet market (Anon., 1993a), with peak exports during the 1950s and 1960s, when several million tortoises were extracted from the region (Lambert, 1979). Over the years, this harvest contributed to an estimated reduction in numbers of the subspecies Mediterranean Spur-thighed Tortoise *T. graeca graeca* in Morocco by around 86% since intensive collection began (Lambert, 1979), a situation exacerbated by habitat degradation and loss (Lambert, 1980). Following Morocco's ratification of CITES in 1975, exportation of the tortoises from the country was banned in that year (Anon., 1993a). Despite the prohibition, a number of exports of Mediterranean Spur-thighed Tortoises have been recorded, albeit in insignificant quantities (Anon., 1993a).

The Mediterranean Spur-thighed Tortoise in Morocco is categorized as "Vulnerable" by IUCN and threatened with extinction (Anon., 1993a). It has been recommended to the Government of Morocco as requiring legal protection more urgently than any other native reptile (T. Slimani, pers. comm., 1995); trade in the species within Morocco is currently legal, however. Field data collected in Morocco during 1994 and 1995 indicate that the population of these tortoises on the edge of the Ademine Forest in the lower Souss valley, near Agadir, a major tourist resort, is not viable (Bayley and Highfield, 1996) (see Figure 1). Local residents claim that where once tens of tortoises could be observed in a few hours, it is now difficult to observe as many during one week of intensive searching (Bayley and Highfield, 1996).

In the light of this, the authors investigated the scale of Moroccan trade in tourist souvenirs made from tortoise carapaces, in an attempt to evaluate the scale of this commerce and its possible effect on remaining Spur-thighed Tortoise populations in the country.

## Methods

Surveys of randomly selected retail outlets in Morocco were made over a five-year period, 1990 to 1995, in order to assess the number of objects on sale which included Mediterranean Spur-thighed Tortoise carapaces. A comprehensive survey was undertaken of the souvenir shops in Agadir, which accounted for 36.3% of the tourist trade in 1993 (Anon., 1993b). In that city, each vendor was visited on at least two occasions and the number of tortoise-based souvenirs on display noted. Attempts to ascertain the level of trade by questioning traders were abandoned, since results appeared too unreliable. However, an attempt was made to estimate trade turnover by monitoring one particular outlet in a prime tourist location.

## Results

Souvenirs made from tortoise carapaces were on sale in every one of the locations selected by the authors, and only in tourist souvenir outlets, with lower incidence in the old inland cities, and fewest of all in the capital city. Anecdotal reports (Raxworthy *et al.*, 1983) suggest that these patterns of occurrence are typical for the country as a whole, and throughout the year.

Souvenirs made from carapaces of Mediterranean Spur-thighed Tortoises appear to be widespread, specifically in, i) fire bellows, incorporating either one or two carapaces each, and ii) decorative banjo-like musical instruments, each using a single carapace as the resonator. The bellows are fully functional, but the banjos are of very poor quality as musical instruments. Carapaces from female tortoises are larger and as a result more commonly used than those of males, the ratio observed from items on display being almost 3:1.

On previous visits by the authors to the region, a limited number of bellows manufactured using the carapaces of Spanish Turtles *Mauremys leprosa* were recorded. These are easily distinguished from those of Spur-thighed Tortoises and during the surveys under discussion no more than five per cent of the trade in chelonian-based souvenirs observed was estimated to involve Spanish Turtles. Otherwise, *all* the bellows and banjos observed were made with Mediterranean Spur-thighed Tortoise carapaces, apart from some which used gourds and ceramicware in place of the carapaces.

© A.C. Highfield

**Banjos incorporating carapaces of Mediterranean Spur-thighed Tortoises *Testudo graeca graeca* and ceramicware, on sale at a tourist shop in Agadir, Morocco.**

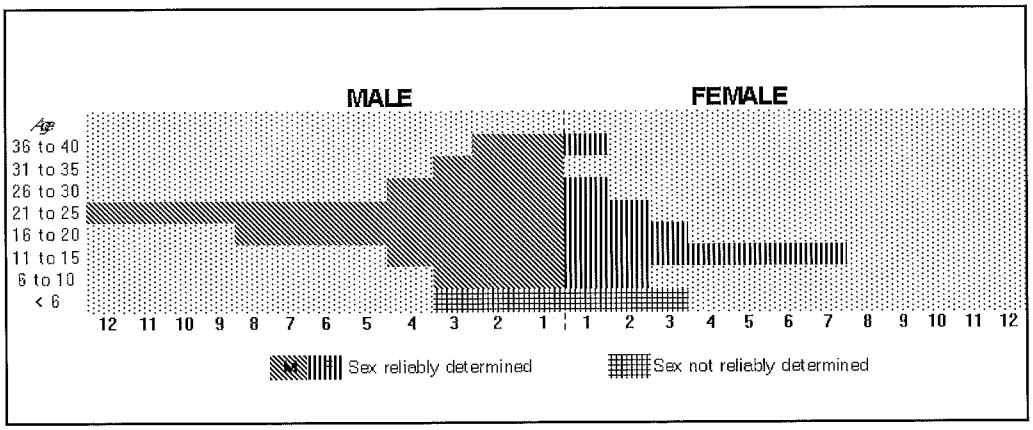



**Figure 1. Age and sex structure of Mediterranean Spur-thighed Tortoises *Testudo graeca graeca* in Ademine Forest, Morocco, based on field sightings.** *Survey by the authors.*

It was observed that few live tortoises are offered for sale to tourists in Morocco (in contrast to practice in Tunisia (Highfield, 1990)). Results of observations made during the survey are set out in Table 1.

| Town | No. of banjos | No. of bellows[1] | Total no. of carapaces used |
|---|---|---|---|
| Agadir | 60 | 15 | 90 |
| Asilah | 15 | 0 | 15 |
| Marrakech | 25 | 6 | 31 |
| Rabat | 10 | 0 | 10 |
| Tangier | 70 | 34 | 104 |
| Taroudant | 18 | 11 | 39 |
| TOTAL | 198 | 66 | 289 |

**Table 1. Number of banjos and bellows[1] made with Mediterranean Spur-thighed Tortoise *Testudo graeca graeca* carapaces observed at various sites in Morocco between December 1990 and April 1995.**

[1] Some of the bellows seen incorporated two carapaces.

Typical marked prices range between 75-200 Dirhams (approximately US$8.50-US$22.50) but the actual price paid is normally significantly less than this.

Information proffered by traders in response to questions about the origins, number and legality of the trade in items made from the tortoises was typically contradictory and unreliable. Some traders, when asked, were prepared to admit that the export was illegal, but most denied this.

## Trade Volumes

The volume of trade, and thus reliable figures of animals involved, is practically impossible to judge. One chosen shop was monitored, however, in an effort to gauge trade levels. In December 1994, 14 souvenirs incorporating carapaces of the Mediterranean Spur-thighed Tortoise were on display at the selected retail outlet. These were photographed *in situ* and their age and sex were recorded, as a means of identification. By March 1995, five out of the original 14 artefacts had been replaced by fresh stock, which represented a minimum turnover of 37.5% per quarter-year. Given that this particular period was not during the peak tourist season, a conservative estimate of turnover for this outlet is 37.5% x 4 or approximately 150% per annum. Although it is impossible to extrapolate reliably from this calculation, the fact that approximately 300 souvenirs with Mediterranean Spur-thighed Tortoise carapaces were observed for sale during the surveys indicates that exploitation may involve hundreds of the tortoises per annum. (Raxworthy *et al.*, (1983) noted about 1500 tortoise carapace banjos on a one-month visit to Morocco.) Reports from the Marrakech region (T. Slimani, pers. comm., 1995) reveal that a number of workshops are occupied exclusively in the production of tortoise-based souvenirs, which suggests a high level of trade. The French tortoise conservation organization, Station d'Observation et de Protection des Tortues, has estimated the number of Spur-thighed Tortoises utilized annually for the souvenir trade in Morocco to be at least 10 000 individuals (B. Devaux, pers. comm.,1994).

## Discussion and Conclusions

It is worrying that the souvenir trade involving this vulnerable subspecies is uncontrolled within Morocco, as evidenced by the widespread availability of items on sale made from the tortoise carapaces. The fact that carapaces of females are apparently favoured in the trade is added cause for concern, in view of the relatively low reproductive potential of Mediterranean Spur-thighed Tortoises (females do not attain sexual maturity until 12-15 years of age). Even an offtake of equal numbers of males and females would pose a threat to the sustainability of populations with delayed sexual maturity (Congdon *et al.,* 1993).

The use of gourds and ceramicware in the construction of banjos, and wood for bellows, should be encouraged as substitutes for tortoise carapaces, especially since the collection and killing of tortoises specifically to supply the souvenir market is a relatively recent phenomenon and neither the bellows nor the banjos are traditional items in Morocco: carapaces were first used in souvenirs as a means of creating commercial potential from a by-product of the trade in live animals (Lambert, 1980). The enforcement of appropriate domestic legislation could be instrumental in restoring populations of the Mediterranean Spur-thighed Tortoise to stability in Morocco and, since visitors from outside Morocco constitute the primary market for these tortoise carapace souvenirs, current CITES requirements should be strictly observed, as a minimum.

## Acknowledgements

The authors wish to thank Karen Guess and Jenni King for their general field assistance in Morocco and Dr T. Slimani of the Université Cadi Ayyad, Marrakech, for invaluable information.

## References

Anon. (1993a). *Significant Trade in Wildlife: a Review of Select Animal Species on CITES Appendix II.* Draft report to the CITES Animals Committee, prepared by the World Conservation Monitoring Centre, IUCN/SSC Trade Specialist Group and TRAFFIC International.

Anon. (1993b). *Morocco in Figures.* Banque Marocain du Commerce Extérieur.

Bayley, J.R. and Highfield, A.C. (1996). Observations on ecological changes threatening a population of *Testudo graeca graeca* L.1758 in the Souss Valley, southern Morocco. *Chelonian Conservation and Biology* 2(1):36-42.

Congdon, J.D., Dunham, A.E. and van Loben Sels, R.C. (1993). Delayed sexual maturity and demographics of Blandling's Turtles (*Emydoidea blandingii*): implications for conservation and management of long-lived organisms. *Conservation Biology* 7:826-833.

Highfield, A.C. (1990). *A Preliminary Report upon the Taxonomic, Biotypic and Conservation Status of the Land Tortoises of Tunisia.* Tortoise Survival Project (The Tortoise Trust), London.

Lambert, M.R.K. (1979). Trade and the Mediterranean Tortoise. *Oryx* 15:81-82.

Lambert, M.R.K. (1980). The Mediterranean Spur-thighed Tortoise *Testudo graeca* in the wild and in trade. In: *Proceedings of the European Herpetological Symposium* 17-23. Cotswold Wild Life Park, Oxford.

Raxworthy, C.J., Rice, S., Smith, D. and Claudius, F. (1983). *A Study of the Reptile Fauna of Cap Rhir, Morocco.* University of London Natural History Society.

---

*A.C. Highfield, The Tortoise Trust, BM Tortoise, London, WC1N 3XX, UK.*

*J.R. Bayley, Department of Geography, Trinity College, Carmarthen, Dyfed, SA31 3EP, Wales, UK.*

TRAFFIC NETWORK


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

**Regional Office**
c/o WWF Hong Kong, 1 Tramway Path, GPO Box 12721,
Central, Hong Kong.
Tel: (852) 2526 1011 x335; Fax (852) 2530 0864; E-mail: tea@asiaonline.net

**Japan Office** 6th Fl. Nihonseimei Akabanebashi Bldg., 3-1-14,
Shiba, Minato-ku, 105, Tokyo, Japan.
Tel: (81) 3 3769 1716; Fax: (81) 3 3769 1304
E-mail: trafficjapan@twics.com

**Taipei Office** PO Box 7-476, Taipei, Taiwan.
Tel: (886) 2 362 9787; Fax: (886) 2 362 9799
E-mail: treatai@ms1.hinet.net

**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@unima.wn.apc.org

**Kenya Office** c/o IUCN Eastern Africa Regional Office, PO Box 68200,
Mukoma Road, Langata, Nairobi, Kenya.
Tel: (254) 2 890605; Tel./Fax: (254) 2 890471; E-mail: nim@earo.iucn.ch

**South Africa Office** c/o Endangered Wildlife Trust, Private Bag XII,
Parkview 2122, South Africa.
Tel: (27) 11 486 1102; Fax: (27) 11 486 1506
E-mail: trafficza@global.co.za

**Tanzania Office** c/o WWF, PO Box 63117, Dar es Salaam, Tanzania.
Tel: (255) 51 22664/28468 x17; Fax: (255) 51 46232

**Regional Office**
Chaussée de Waterloo 608, 1050 Brussels, Belgium.
Tel: (32) 2 343 82 58; Fax: (32) 2 343 25 65

**France Office** 151 Boulevard de la Reine, 78000 Versailles, France.
Tel: (33) 1 39 24 24 02; Fax: (33) 1 39 53 04 46

**Germany Office** Hedderichstrasse 110, 60591 Frankfurt (M), Germany.
Tel: (49) 69 60500380; Fax: (49) 69 617221
E:mail: wwfd.melisch@oln.comlink.apc.org

**Italy Office** Via Garigliano 57, 00198 Rome, Italy.
Tel: (39) 6 844971; Fax: (39) 6 85300612

**Netherlands Office** PO Box 7, 3700 AA Zeist, The Netherlands.
Tel: (31) 30 6937307; Fax: (31) 30 6912064; E-mail: jonkman@wwf.nl

**Russia Office** WWF 232, PO Box 289, Weybridge, Surrey KT13 8WJ, UK.
Tel: (7) 095 2649948; Fax: (7) 095 2649927
E-mail: igor@ch.inv.bio.msu.su

172-B Lodi Estate, New Delhi 110003, India.
Tel: (91) 11 4611258; Fax: (91) 11 4626837
E-mail: wwfindel@unv.ernet.in

GPO Box 528, Sydney, NSW 2001, Australia.
Tel: (61) 2 2996582; Fax: (61) 2 2996557
E-mail: traffico@peg.pegasus.oz.au

Locked Bag No. 911, Jln. Sultan PO,
46990 Petaling Jaya, Selangor, Malaysia.
Tel/Fax: (60) 3 7947220
E-mail: trafficmya@wwfnotice.infonet.com

1250 24th Street, NW, Washington, DC 20037, USA.
Tel: (1) 202 293 4800; Fax: (1) 202 775 8287
E-mail: Gaski+r%wwfus@mcimail.com