

# THE TRADE IN WILDLIFE

Regulation for Conservation



edited by Sara Oldfield

## Chapter 1

# The Nature and Extent of Legal and Illegal Trade in Wildlife

---

*Steven Broad, Teresa Mulliken and Dilys Roe*

### INTRODUCTION

The sale and exchange by people of wild animal and plant resources – more simply ‘wildlife trade’ – is an issue at the very heart of the relationship between biodiversity conservation and sustainable development. Directly and indirectly, increasing demand and consumption are depleting the Earth’s living natural resources at an alarming rate, yet these same resources offer the biological foundation upon which human society depends.

Although only one of a range of forces capable of driving this depletion, wildlife trade is related to some of the most important underlying causes of biodiversity loss. Widespread poverty and insecurity drive people to adopt ways of life that degrade the environment upon which they depend such that sustainable livelihoods cannot be maintained. At the same time, wealth often fuels consumption patterns that undervalue and drive the over-exploitation and depletion of natural resources. Linking the worlds of poverty and wealth, is an increasingly liberalized global economic system based on development and resource-use models that many believe to be flawed.

The historical impacts of wildlife trade on the security of biological resources have largely been negative, but the utilitarian value of wild animals, plants, their products and derivatives continues to make an important contribution to the fulfilment of human needs. This value may in some circumstances provide direct positive incentives for protection of natural habitats and systems. In turn, these incentives can compete with the overwhelming economic forces driving land conversion from natural ecosystems to biodiversity-poor agricultural systems, which represents the greatest cause of depletion of biodiversity today.

#### 4 Background

The trade in wild plants and animals and their parts and derivatives is big business, estimated to be worth billions of dollars and to involve hundreds of millions of plants and animals every year. The trade is diverse, ranging from live animals and ornamental plants to a vast array of wildlife products and derivatives. Fish and other food products, exotic leather goods, musical instruments, timber, tourist curios and medicines and other wildlife commodities can be found in markets around the globe.

This trade is complex and constantly evolving and, in many cases, poses a major challenge to conservation of biological diversity, either directly, through over-exploitation or indirectly, through impacts such as by-catch of non-target species and introduction of invasive species. Most of the trade is legal, but a significant portion of it is not. Both legal and illegal traders adapt to changing circumstances. They target new species when others become depleted, shift to new markets, or in the case of illegal trade develop new smuggling methods and routes to avoid detection. The increasing globalization of trade, creation of common markets and advances in technology all add further complications to the already difficult task of ensuring that trade is legal, maintained within sustainable levels, and that it does not have indirect negative impacts on the conservation of biodiversity.

### COSTS AND BENEFITS

Detrimental impacts of unsustainable wildlife trade have been widely documented, notable examples including the depletion of populations of great whales, marine turtles and rhinoceroses through over-exploitation. Historical evidence of species extinction being caused primarily by human over-exploitation is patchy (Groombridge, 1992), though in combination with other threats, especially habitat loss, wildlife trade has been shown to result in significant declines in wild populations of many species. Over-exploitation can also have a negative impact on ecosystem functions, though such effects are often extremely difficult to demonstrate reliably (forest loss caused by timber extraction being one of the more tangible examples). A more obvious risk in many cases is loss of resource productivity and value resulting from population depletion, and in extreme circumstances leading to commercial extinction.

Beyond direct negative biological impacts, wildlife trade can cause indirect impacts of conservation concern, the two most obvious examples being detrimental by-catch of non-target species and introduction of harmful invasive alien species. Examples of detrimental by-catch are particularly well documented in the fisheries sector as with incidental catch of marine turtles and seabirds in capture fisheries. Terrestrial examples include impacts on non-target species from timber harvesting and waterfowl hunting (Freese, 1998). Negative conservation impacts of alien species introductions caused by wildlife trade are less well documented; some of the more problematic examples have been linked



to deliberate movements of ornamental plants and food and game fish species outside their natural ranges.

Juxtaposed with these risks are the enormous benefits derived by people from consumptive use of wild plant and animal resources. Wildlife resources play a major and very often critical role in the livelihoods of a high proportion of the world's population and it is often the poorest people and households that are most dependent on these resources (Prescott-Allen and Prescott-Allen, 1982; Pimental et al 1997; Scoones et al, 1992; Arnold, 1995; Neumann and Hirsch, 2000; Nasi and Cunningham, 2001).

Numerous studies have noted the importance of wild food products, which are of particular importance to women, children and the poor for whom securing access to such resources is important for sustaining their livelihoods (Scoones et al, 1992; Warner, 1995; FAO, 1995; Cavendish, 1997; Barnett, 2000). Clarke et al, (1996), however, point out that the same cannot be said for big game in Africa, the household consumption of which increases with increased wealth. Some species are used daily while others are considered 'famine foods' and used only occasionally. Wild foods often fill a seasonal gap and are used when little else is available (Scoones et al, 1992). Wild foods include fruits, mushrooms, nuts, leaves and starches as well as meat and fish. Owing primarily to species conservation concerns, particular attention has been focused recently on the use of wild animal species for meat. According to Bennett and Robinson (2000), wild animals (including fish) contribute 20 per cent or more of the animal protein in rural diets in at least 62 countries. The use of wild meat varies by region and dietary custom. In West Africa for example, there is a high level of consumption – wild animals account for 75 per cent of meat intake in Liberia (Bennett and Robinson, 2000). In Ghana, an estimated 305,000 tonnes of wild meat is sold annually with a net value of approximately US\$275 million (Government of the Republic of Ghana, 1998). In Côte d'Ivoire, an estimated 100,000 tonnes of wild meat was harvested in 1996, nearly twice as much meat as produced from domestic livestock (Caspary et al, 2001). A recent TRAFFIC study notes that reliance on wild meat is growing in Eastern and Southern Africa in response to increased human populations and poverty – for example, 80 per cent of rural Kenyan households depend on wild meat for the majority of meat protein (Barnett, 2000).

Wildlife in the form of trees and plants also provides an important source of fuel for cooking and heating, especially in rural areas, with 90 per cent of fuel-wood production taking place in developing countries (Bourke and Leitch, 2000). According to the Food and Agriculture Organization (FAO) data, nearly 464 million cubic metres of wood fuel were produced in Africa in 1998, of which all but a tiny fraction (less than one per cent) was consumed there. Nearly double that level – 883 million cubic metres – was produced in Asia with consumption once again equalling over 99 per cent of total production (FAO, 2001a). Fodder is considered the most important non-wood forest product (NWFP) in the drier regions of continental and South Asia, and to be of great importance in the arid and semi-arid zones of Africa (FAO, 2001b).

Wild species, both animal and plant, are also important components of traditional medicines, upon which an estimated 80 per cent of the world's population has been said to rely for primary health care. This frequently cited figure is attributed to the World Health Organization (WHO) (WHO, IUCN and WWF, 1993). Prescott-Allen and Prescott-Allen (1982) estimated that 95 per cent of traditional medicines were plant-based. However, a variety of animal species are also used for medicinal purposes, ranging from tigers *Panthera tigris* to medicinal leeches *Hirudo medicinalis*. Medicines are considered among the most important NWFPs throughout the world according to a recent FAO assessment of forest resources (FAO, 2001c). Wild plants are also an important source of materials for construction of furniture, housing, clothing, household utensils and ornamentation.

In these and other sectors of wildlife use, for all but strict subsistence purposes, benefits also derive from a wide range of economic activities along the marketing chain. These values are examined in greater detail later in this chapter.

### QUANTIFYING WILDLIFE TRADE – AN OVERVIEW

Wildlife trade is an economic activity carried out across the globe at local, national and international levels. The dividing line between purely subsistence use of wildlife, which plays a critical role in the livelihoods of a high proportion of the world's population, and wildlife trade is often blurred (Freese, 1998). Wildlife products such as fruits, mushrooms, nuts, leaves, fuel wood, wild meat and fish are both consumed directly and sold into the cash economy, sometimes by the same people in the same locations. Estimates of the number of people dependent on NWFPs for at least part of their income range from 200 million worldwide to one billion in the Asia and Pacific region alone (van Rijsoort, 2000).

For a wide variety of reasons, it is not easy to quantify the world's wildlife trade. Local use of wild plants and animals may account for the majority of global wildlife trade in terms of trade volume and perhaps even value. However, the nature of such trade is that it is often carried out through informal trade networks and beyond the reach of government statisticians. Even the more structured aspects of domestic trade in wildlife commodities, between regions within a country and to supply urban markets, is seldom closely monitored and even where it is, statistical records of trade volumes and values are dispersed and difficult to compile.

Specific analyses of domestic wildlife trade show some interesting results. Campbell and Brigham (1993) studied the relative importance of local, national and international trade for NWFPs in Zimbabwe and concluded that international trade involved far fewer species than subsistence use or domestic trade and was therefore likely to be less significant for the majority of rural

communities. Similarly, Nash (1994) concluded in a review of the South-East Asian songbird trade that domestic trade in live birds within Indonesia (roughly estimated as at least 1.3 million wild-caught birds per year) greatly exceeded the export trade, previously perceived as the main conservation trade-related conservation issue for the bird species involved. Likewise, a review of wild meat use in Eastern and Southern Africa in the late 1990s indicated that commercial trade to urban centres, rather than subsistence use, had become the dominant driving force for rural hunters in many of the areas studied (Barnett, 2000).

## QUANTIFYING WILDLIFE TRADE – FOCUS ON INTERNATIONAL TRADE

### Information sources

Any effort to describe the international wildlife trade must unfortunately begin with the recognition that this cannot be done with any accuracy. The trade is very poorly documented in terms of the species or products involved, trade volumes and trade values. The international trade in timber and fisheries products is relatively better documented than the trade in most other wildlife commodities, which is a reflection of the greater monetary value of this trade.

There are two main sources of data on the international wildlife trade: customs data and annual reports compiled by parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Customs data include information on trade volumes and declared values upon export and import. These are compiled by national governments and organized according to commodity types, most often using the Harmonized Commodity Description and Coding System (HS). Customs data provide information on levels of processing and overall trade volumes, but rarely on the species or number of specimens involved. Much of the trade data compiled by the FAO and the UN Conference on Trade and Development (UNCTAD) are based on customs data and therefore have the same limitations. The International Tropical Timber Organization (ITTO) compiles more detailed data for the trade in tropical timbers, but again, these are often not specific to the species or even the genus level.

By virtue of CITES annual reporting requirements, the trade in CITES-listed species is relatively well documented. Information on the different species and the number of specimens reported in trade by CITES parties is compiled by the United Nations Environment Programme – World Conservation Monitoring Centre (UNEP-WCMC) on behalf of the CITES Secretariat. However, the number of species covered by CITES is small relative to the overall number of wildlife species in trade. Furthermore, problems with the accuracy of CITES trade reporting mean that trade data are indicative rather than actual. CITES trade data are better for live animal specimens than for plants or for animal and plant products.



Cross-border trade in many regions is likely to circumvent CITES or other trade control measures, for example customs controls, and therefore not to be accounted for within either customs or CITES data. By its very nature, illegal trade is also undocumented, with the exception of information available for seized shipments that is sometimes reported in the media or CITES trade data.

Although referring specifically to the trade in NWFPs, Iqbal (1993) summarizes the situation with regard to the wildlife trade in general when he states that:

*Basic information ... is seriously lacking... Trade statistics, as far as they do exist, are to be handled with much thought, as a very large volume of NWFP are being traded unregistered. Under-reporting or not reporting at all, double counting, grouping of NWFP among themselves and with other products, and the use of unrealistic prices are among the systematic shortcomings of these statistics. Such statistics, however, are a starting point to get information and at best can be considered as indicative only.*

### Scale of international wildlife trade

As indicated earlier, timber and fisheries products dominate the international wildlife trade in terms of volume and value. Approximately one billion cubic metres of wood products (including pulp and paper, but excluding fuel wood) were exported in 1999 (FAO, 2001a), with the total value of forest product exports (excluding fuel wood) during that year estimated at US\$132 billion (FAOSTAT, 2002). According to FAO data, nearly 116 million cubic metres of sawn wood were traded internationally in 1998 (FAO, 2001a).

According to the FAO, 117 million tonnes of fish were produced via capture fisheries and aquaculture in 1998. Approximately one-third of fish (live-weight equivalent) produced during this year entered international trade, with 20 per cent of exports coming from 'low-income food deficit' countries. The total value of fish and fishery product exports in 1998 was US\$51,300 million, of which developing countries accounted for 50 per cent. FAO estimates that 36 million people, comprising about 15 million full-time, 13 million part-time and 8 million occasional workers, are employed in primary capture and aquaculture fisheries production (FAO, 2000).

A 1993 study commissioned by the FAO (Iqbal, 1993) identified approximately 150 NWFPs considered of major significance in international trade based on a preliminary review of available trade data and other references. A list of products identified is reproduced in Table 1.1.

Relatively few of the commodity types identified by Iqbal are commonly thought of as being components of 'the wildlife trade', and most do not include species covered by CITES. Exceptions include wild animals and animal products, ornamental and medicinal plants and incense woods.

The scale of the annual international trade in more 'typical', if actually less common, wildlife products during the 1980s is illustrated in Table 1.2.

**Table 1.1** *Commercially Significant NWFPs in International Trade*

<i>Category</i>	<i>Product</i>
Food products	Nuts: Brazil nuts, pine nuts, pignolia nuts, malva nuts, walnuts and chestnuts Fruits: jujube, sapodilla, ginkgo Fungi: morels, truffles, pine mushrooms Vegetables: bamboo shoots, osmunds, reindeer moss, palm hearts Starches: sago Bird nests Oils: shea nuts, babassu oil, illipe oil Maple sugar
Herbs and spices	Nutmeg, mace, cinnamon, cassia, cardamom, galanga, allspice, caraway, bay leaves, oregano etc
Industrial plant oils and waxes	Tung oil, neem oil, jojoba oil, kemiri (candle, lumbang) oil, akar wangi, babassu, oiticica and kapok oils Carnauba wax
Plant gums	For food uses: gum arabic, tragacanth, karaya, carob Technological grade gums: talha, combretum
Natural pigments	Annatto seeds, logwood, indigo
Oleoresins	Pine oleoresin, copal, damar, gamboge, benzoin gum, dragon's blood (Benjamin), copaiba oil, amber
Fibres and flosses	Fibres: bamboo, rattan, xateattap, aren, osier, raffia, toquilla straw products, cork, esparto, Erica and other broom grasses Flosses: kapok or silk colton
Vegetable tanning materials	Quebracho, mimosa, chestnut and catha/cutch
Latex	Natural rubber, gutta percha, jelutong, sorva and chicle
Insect products	Honey, beeswax, lac and lac-dye, silk, cochineal, aleppo galls, kermes
Incense woods	Sandalwood, gharu or aloewood [agarwood]
Essential oils	Various
Plant insecticides	Pyrethrum, derris, medang and peuak bong
Medicinal plants	Various
Wild plants	Various
Animals and animal products	Ivory, trophies, skins, feathers, eggs, butterflies, live animals and birds
Miscellaneous	Bidi leaves, soap nut, Quilliaia bark, betel and cola nuts, chewing sticks, lacquer, dom nuts or ivory nuts

Source: Iqbal, 1993, as cited in Iqbal, 1995

More recent estimates for the trade in some CITES-listed taxa were provided by UNEP-WCMC (see Figure 1.1).



Table 1.2 Wildlife Products in Trade during the 1980s

Species group or product	Quantity in trade
Live primates	40,000
African elephant ivory	Tusks from 90,000 elephants
Pelts from wild furbearers	15 million
Live birds	4 million
Reptile skins	10 million
Tropical fish	350 million
Orchids	1 million

Source: Fitzgerald, 1989

*Fauna (annual mean, 1995–1999)*

- Over 1.5 million live birds (250,000 App II; 1,250,000 App III)
- 640,000 live reptiles
- 300,000 crocodylian skins (world trade is over 1,200,000 but mostly farmed)
- 1,600,000 lizard skins
- 1,100,000 snake skins
- 150,000 furs
- Almost 300 tonnes of caviar
- Over 1,000,000 pieces of coral
- 21,000 hunting trophies

*Flora (1999)*

- 19 million bulbs exported from Turkey
- Over 53,000 live wild-collected orchids exported from Central America and Vietnam
- Over 200 tonnes of dried orchid roots from Vietnam to the Republic of Korea
- 360,000 cacti 'rainsticks' exported from Chile and Peru
- 70 tonnes of *Aloe ellenbeckii* resin exported from Kenya to China
- Over 300 tonnes of *Aloe ferox* extract exported from South Africa
- 120 tonnes of Agarwood *Aquilaria malaccensis* chips exported from Indonesia and Malaysia
- 30 tonnes of American Ginseng *Panax quinquefolius* roots exported from the United States

Source: Caldwell, in litt, 2001

Figure 1.1 Reported International Trade in CITES-listed Flora and Fauna

### Commodities in international wildlife trade

Wild species are traded internationally in many forms in order to produce a wide variety of products. Major uses include:

- Medicines. Many medicines, both traditional and 'western' are based on wild plants or compounds extracted from them. Approximately 1000 plant species have been identified in international trade in East Asia alone (Lee, in prep), and 700 imported for use within Europe. The global international trade in medicinal and aromatic plants exceeded 440,000 tonnes in 1996, and was valued at US\$1.3 billion (Lange, 1998).
- Food. Although most wildlife hunted or collected for use as food is consumed for subsistence purposes, there is a substantial international trade in a variety of NWFPs, well-known examples including Brazil nuts *Bertholletia excelsa*, palm hearts, pine nuts, various mushrooms and spices. The trade in fisheries products dominates the food trade in animal species.
- Ornaments and furnishings. A wide variety of wildlife products are used for decoration and ornamental purposes including, ivory, coral, turtle and mollusc shells, reptile and other skins, and feathers. Tourist items are often crafted from local wildlife, including jewellery and ornaments crafted from corals and shells, curios such as insects or other small animals encased in plastic and stuffed animals.
- Wearing apparel. Skins, furs, feathers and fibres from many mammal, reptile, bird and fish species are traded internationally to make clothing, boots and shoes, bags and other items. These include expensive and high fashion items, for example shahtoosh shawls made from the endangered and Appendix I-listed Tibetan antelope *Pantholops hodgsonii* as well as more widely available and legally traded products such as snake-skin accessories.
- Pets/Hobbies. The increased availability of air transport around the world has greatly expanded the variety and numbers of wild species traded for use as pets or for hobbies. The international trade is dominated by reptiles, birds and ornamental fish, but includes invertebrate species such as scorpions and spiders. Imports of wild birds into the US, once one of the main markets for CITES-listed species, have declined significantly as a result of increased import restrictions. Imports of live reptiles have increased, however.
- Ornamental plants. Many common garden and indoor plants are the product of an international trade that has been taking place for centuries. This includes many bulbous species, for example snowdrops *Galanthus* spp and crocuses *Crocus* spp, cyclamens *Cyclamen* spp, orchids, tree ferns, bromeliads, cycads, palms and cacti. Although much of the trade now involves artificially propagated plants, there are still millions of wild plants traded internationally each year, including a specialist trade in rare species.
- Manufacturing and construction. Forest products including timber, rattan and bamboo for furniture making, plant oils and gums, dyes, resins and latex are all traded internationally in large volumes.

### Key countries involved in the international wildlife trade

Research on the NWFP trade undertaken by the FAO identifies China as the exporter of the largest quantities, with other major suppliers being India, Indonesia, Malaysia, Thailand and Brazil. Approximately 60 per cent of all NWFPs in trade are imported by the EU, US and Japan and the general direction of wildlife trade flows is from developing to developed countries (Iqbal, 1995). It should also be noted that among those countries for whom wildlife trade is commercially significant are included some of the poorest countries and some of the countries richest in biodiversity resources (Roe et al, 2002).

In a recent analysis of wood production and consumption, FAO (2001a) reported the increasing importance of the Chinese market. Growing consumption and lack of adequate forest resources had contributed to a recent rapid increase in its imports. China was reported to be the world's third largest importer of primary forest products, after the US and Japan. The same report noted that global trade patterns were changing, largely as a result of increased trade among developing countries, especially between countries in the Asian region. Trade patterns have also become more diverse, and there had been increased intra-regional trade in other regions such as North America.

As for fisheries, a review of production and trade by the FAO (2000), noted that in 1998, China, Japan, US, the Russian Federation, Peru, Indonesia, Chile and India (in that order) were the top producing countries, together accounting for more than half of global capture fisheries production by weight for that year. China alone accounted for 32 per cent of the world total. As for consumption, the same report indicated that Japan was the largest importer of fishery products in 1998, accounting for some 23 per cent of total world imports, but Japanese imports of fish and fishery products had declined recently as a result of the economic recession. The EU had further increased its dependence on imports for its fish supply. The US, despite being the world's fifth major exporting country, was also its second main importer. More than 77 per cent of the total world import value was concentrated in these three areas.

## VALUATION OF WILDLIFE TRADE

### Overview

The lack of information on wildlife use in general makes it very difficult to estimate total and relative levels of wildlife use for domestic and commercial use (Burgess, 1992). As noted by Wollenberg and Belcher (2001):

*only a small subset of forest products possesses potential for significant cash income and employment generation... The majority of these products have low cash values and are used for consumption, rather than for sale.*



For some, however, wild products can be a significant source of cash income, particularly in marginal agricultural areas. As previously mentioned, estimates of the number of people dependent on NWFPs for at least part of their income range from 200 million worldwide to one billion just in Asia and the Pacific (van Rijsoort, 2000). According to Wollenberg and Belcher (2001), species with the most potential to contribute significantly to cash incomes include some rattan and bamboo species, resins, birds' nests, various fruits and nuts and medicinal plants. Timber was considered one of the most valuable forest products, but one that was rarely available to local communities for income generation on any significant scale.

The importance of the trade in NWFPs has been noted by the FAO, which stated that: 'Traded products contribute to the fulfilment of daily needs and provide employment as well as income, particularly for rural people and especially for women' (FAO 2001c). In their review of the literature on the trade in wild meat in West Africa, Kasim and Long (2000) determined that cash income, from sales of products such as wild meat, would become increasingly important for paying school fees and taxes, for example, as rural communities entered the cash economy.

### **International trade value**

The value of the international wildlife trade is even less well documented than the quantities of specimens in trade. An estimate of US\$4–5 billion per year, not including timber and fisheries has been credited to the United Nations Environment Programme (UNEP, 1989, cited in Roth and Merz, 1997), while Fitzgerald (1989) uses a figure of 'at least' US\$5 billion for the wholesale value of products in trade. Iqbal (1995) provides a more recent estimate for the trade in NWFPs of over US\$11 billion. TRAFFIC estimated an import value in the early 1990s approaching US\$15 billion for all wildlife products – forest-related or not, climbing to nearly US\$160 billion if wild-sourced timber and fish products are included (Table 1.3).

Although wildlife has often been considered under the umbrella of 'minor forest products', some species and specimens can command high prices. In Taiwan, the highest grade of agarwood, a fragrant resinous wood produced by some Indomalaysian tree species of the genus *Aquilaria*, can sell for US\$11,500/kg, and is now virtually unavailable (Barden et al, 2000). The retail price of a single blue and gold macaw *Ara ararauna*, of which approximately 42,000 were traded internationally from 1981–1992, could be as high as US\$1200 in the early 1990s. Hyacinth macaws *Anodorhynchus hyacinthinus*, the largest parrot species in the world, and bright blue in colour, were offered for sale for upwards of US\$8000 during the 1980s (Mulliken and Thomsen, 1995) – the price reflecting the fact that international trade in these very rare birds was banned both by range states and CITES.

**Table 1.3 Estimate of the Annual Value of Global International Trade in Wildlife in the early 1990s**

Commodity	Estimated value US\$
<i>Live animals</i>	10 million
Primates	60 million
Cage birds	6 million
Reptiles and amphibians	750 million
Ornamental fish	
<i>Animal products for clothing/ornament etc</i>	750 million
Mammal furs and fur products	200 million
Reptile skins	750 million
Reptile skin products	200 million
Mollusc shells	20 million
Ornamental corals	90 million
Natural pearls and products	
<i>Animal products for medicine</i>	30 million
Wild ungulate products for medicine (deer velvet, musk etc)	5 million
Chelonian products	5 million
Seahorses	
<i>Animal products for food (excluding fish)</i>	120 million
Game meat	60 million
Frogs legs	65 million
Swiftlet nests	460 million
Edible snails	
<i>Live ornamental plants</i>	250 million
'Wild' plant trade	
<i>Non-wood forest products</i>	11.7 million
Global NWFP estimate (Iqbal, 1995)	
<i>Subtotal excluding fisheries food products &amp; timber</i>	14.9 billion
Fisheries food products	40 billion
Timber	104 billion
<b>TOTAL</b>	<b>158.9 billion</b>

Source: TRAFFIC analysis based on declared import values from various sources, largely derived from published FAO and customs data.

Persistent demand for rare species such as hyacinth macaw *Anodorhynchus hyacinthinus* (listed in CITES Appendix I since 1987) and common species that are nevertheless restricted in international trade in some way (for example through national-level harvest or export controls and imposition of duties) collectively drive a widespread illegal trade in wildlife. The true size of the illegal

trade is anyone's guess – and several have tried. One estimate states that the illegal component of the trade is US\$5–8 billion (UNEP, 1998). Roth and Merz (1997) have claimed that the illegal trade in wildlife products is the world's second largest illegitimate business after narcotics. However the very nature of the illegal trade is such that no reliable data are available to support this assertion.

## UNDERSTANDING TRADE STRUCTURE AND DRIVING FORCES

Beyond quantification of wildlife trade volumes, patterns and values, it is critical that any regulatory or non-regulatory interventions aimed to avoid risks and maximize benefits take into account the structure of the trade and the driving forces motivating this sector of commerce.

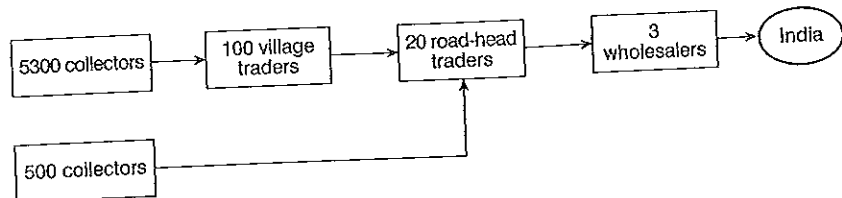
### Structure of wildlife trade chains

The journey of any given wildlife product from the collector at source to the final consumer can involve a wide range of intermediaries and other stakeholders. While wildlife trade is often perceived as a predominantly rural activity, the urban dimension should not be underestimated. Barnett (2000) found that in Eastern and Southern Africa, complex rural to urban supply networks have developed for the wild-meat trade, which is driven by urban demand and lucrative prices. Kasim and Long (2000) similarly comment on the importance of urban markets, stating that there is evidence that much of the commercial trade in wild meat is in the hands of urban-based entrepreneurs who subcontract rural hunters, adding that wild-meat sales have moved beyond local urban markets to the international arena.

Warner (1995) describes the concessionaire system frequently used in the past in Asia, where collection and marketing of high value wildlife products for export or processing was often under a government-granted concession system, with the concessionaire having the right to sell all of a specified product that was collected from a designated area. This is the system that currently exists for collection of edible birds' nests. The concessionaire would need a number of collectors to ensure an adequate supply of the product and these collectors would often trade the collected products to the concessionaire for food and manufactured goods. If the collectors were in debt to the concessionaire (a common occurrence) they could easily enforce product collection and hence maintain supply. Warner notes that this form of 'debt bondage' is now decreasing in the Asia-Pacific region as the concessionaire system is being restructured or eliminated and as collectors increasingly form cooperatives and associations.

Even in systems where there is no concessionaire, few products are sold directly from collectors to wholesalers or processors because of the small





Source: Edwards, 1993, as depicted in Warner, 1995.

**Figure 1.2** Supply Chain for Trade in Medicinal Plants from East Nepal to India

quantities involved. Middlemen – often local traders – are generally involved and handle storage and transport, for example. Edwards (1993) has described the trade chain for the export of medicinal plants from Eastern Nepal to India, noting the involvement of a series of middlemen between collectors and buyers in India, with the relatively small number of Terai-based wholesalers exerting the main influence over prices received by harvesters (Figure 1.2). Village traders were noted as providing an important marketing service to collectors, for example in transport and provision of credit.

The live bird trade in Tanzania usually has from two to three tiers – trappers, middlemen and exporters – with some trappers selling direct to exporters (Moyer, 1995). A three-tiered system is also described by Edwards (1992) with regard to the live bird trade in Guyana, where the majority of trappers were Amerindians. According to Parsaud (2001), Head of Guyana's Wildlife Division, Amerindians are not directly involved in the export of wildlife, which is dominated by seven or eight exporters, and are 'being fleeced all the time' with a lot of them 'being owed monies'. Potential reasons for their lack of participation in the export process included the remoteness of their communities or presumed lack of knowledge of the business.

As described by Neumann and Hirsch (2000):

*the structure of relationships between collectors, middlemen, traders and wholesalers can be highly complex, involving various elements of exploitation, risk, cooperation, collusion and resistance ... the character of these relationships can shift through time, from locale to locale and at different points along the marketing chain... Lack of access to information, transport, credit and storage facilities combine to keep collectors at a great disadvantage in the market place. And these conditions provide plenty of opportunities for intermediaries to position themselves as almost unavoidable links in the marketing chain.*

Shortening the supply chain is often seen as the answer to increasing income to collectors. However, as noted by Edwards (1993) with regard to the medicinal plant trade in Nepal, intermediaries also perform many vital functions including transport, packing and risk taking. Removing intermediaries would expose those with little resilience to a volatile industry. As Warner (1995) points out,

middlemen are often perceived as being the villains, but the value of the services they provide should not be underestimated. If they are removed from the marketing chain then the services provided must be met from some other source. In the case of Nepal's medicinal plant trade, Edwards (1993) has recommended the formation of marketing collectives to increase the ability of collectors to access market information and sell direct to road-head traders, and Olsen and Helles (1997) recommended establishment of credit facilities and support to road-head traders to sell direct to India, as well as public dissemination of market information.

In other cases intermediaries add little or no value and simply capture a little (or a lot) of the income from the sale of wildlife. In the Tanzanian villages visited as part of a recent TRAFFIC study, village middlemen pay trappers only 50 per cent of what they themselves receive from city-based traders, yet have few costs. Since the majority of species are collected to order, they do not have significant risks such as paying collectors before they are paid.

### **Drivers**

As for any other commercial activity, a primary motivating factor for many participants in wildlife trade is purely economic in nature. People derive direct revenues along the marketing chain of a wildlife product, through cash income or exchange of commercial services. As for other commodities, those involved in wildlife trade may be motivated by speculation about future values rather than immediate monetary benefits, particularly when dealing with non-perishable wildlife goods. Typically, revenue distribution along the trade chain for wildlife goods is uneven, with resource owners and harvesters receiving only a small fraction compared to intermediaries and retailers (Freese, 1996). Those involved in illegal activity may work at any point of the trade chain, gaining through direct trade revenues or indirect income, especially through corruption in regulatory systems.

However, the behaviour of participants in wildlife trade is not exclusively motivated by monetary benefits. Wildlife trade is driven by diverse socio-economic and cultural factors, including:

- food supply (from elements of staple diets to tonic and novelty foods);
- healthcare (from herbal remedies to ingredients of industrial pharmaceuticals);
- provision of industrial materials (including timber and a wide range of ingredients in manufacturing processes, such as gums and resins);
- religion (live animals, and a wide range of wild plant and animal parts);
- collecting (including live animals and plants and a range of wildlife specimens and curios);
- clothing and fashion (leather, furs, feathers etc);
- sport (including trophies and live birds).

These and other factors can often be equal or greater in importance than direct monetary benefits in driving wildlife trade patterns. Recent research into consumer perceptions about consumption of endangered species ingredients in traditional Asian medicines provides excellent illustration of the complexities of understanding wildlife demand and framing effective conservation interventions (Lee, 1998; Lee et al, 1998). For example Lee (1998) found that many traditional medicine consumers were motivated to avoid use of endangered species, but that awareness levels about the nature and origin of medicinal ingredients was often low. A small proportion of consumers, however, indicated that they would use medicines containing endangered species, despite understanding the conservation implications.

### FRAMING A RESPONSE TO WILDLIFE TRADE CHALLENGES

Responding to conservation problems associated with wildlife trade is not a straightforward challenge. In most situations, there is enormous uncertainty in almost every key variable related to decision-making, including:

- species status, population trends and other basic biological information;
- driving forces for harvests, monetary and non-monetary;
- causes of decline and the relative importance of wildlife trade impacts;
- definition of 'sustainable' wildlife exploitation;
- prediction of future changes in species and ecosystem status, economies and people's behaviour;

Unfortunately, remedial actions are often taken without due attention to such uncertainty and such actions are rarely linked to the establishment of means to judge their impact over time.

Over the past 25 years, the predominant response to concerns about over-exploitation of wildlife has been regulatory intervention by governments. Such regulation has been enacted through local and national laws and through multilateral instruments, particularly CITES, and a wide range of international agreements governing fisheries management.

Increasingly over this time, the 'precautionary principle' has been invoked in such regulatory decisions as a means to address the various aspects of uncertainty noted above. At risk of overgeneralizing this evolution in policy, it could be claimed that the burden of proof has shifted so that it is now more common for trade bans or strict limitations on trade volumes to be introduced and maintained until 'users' prove lack of conservation risk. This may be a pragmatic reaction to uncertainty and a counterbalance to earlier inaction by governments, traders and consumers in the face of overwhelming evidence of conservation damage for some wildlife species in trade. However, some argue that more flexible and adaptive approaches to wildlife management and regulation would be more effective.



Complicating this situation still further is the fact that wildlife trade regulations are often not motivated solely by specific conservation concerns, with many protective measures justified by concerns such as animal welfare, cultural values and wider commercial interests.

There is little doubt that regulatory measures have affected wildlife trade patterns, if nothing else in many cases by changing a lawful activity into an illegal one. However, application and enforcement of regulatory systems for wildlife trade often suffer from low prioritization by governments (as compared for example to controls on trade in narcotics and weapons), and resulting underinvestment, uneven application and failure to offer a deterrent to illegal activity. A common response to such concerns is a call for increased enforcement investment and effort and often this may be the best course of action to take. Nevertheless, there are also sound reasons in many cases to revisit the rationale for and design of wildlife trade regulations, focusing attention on what specific conservation and socio-economic impacts are intended and how best they can be achieved.

A range of non-regulatory approaches to wildlife trade concerns has gained increasing attention in recent years, especially initiatives such as certification and eco-labelling, aimed to encourage sustainable consumer behaviour. Again, such efforts struggle to address the uncertainties related to biological, management and economic factors.

## CONCLUSION

This chapter provides just a glimpse of the complexities of the trade in wild animals and plants. Weighing the conservation impacts associated with the wildlife trade against the wide range of benefits that people derive from it is not an easy task. All too often in the past, the conservation risks of wildlife trade have not been adequately assessed or acknowledged before significant negative impacts have occurred. At the same time, interventions aimed to resolve such problems have typically been hampered by a partial understanding of trade dynamics and drivers and tended to be over-reliant on a limited range of remedial strategies. To minimize risk and maximize benefits in future it is essential that there is a greater emphasis on multidisciplinary analysis of wildlife trade issues and development of adaptive responses focused on clear conservation and socio-economic goals and the motivating factors that will ensure that such goals are achieved.

## ACKNOWLEDGEMENTS

This chapter contains substantial extracts from Chapters 1 and 2 of *Making a Killing or Making a Living: Wildlife Trade, Trade Controls and Rural Livelihoods*, by Dilys Roe, Teresa Mulliken, Simon Milledge, Josephine Mremi, Simon Mosha

and Maryanne Grieg-Gran, published by IIED in March 2002 (*Biodiversity and Livelihoods Issues*, no 6).

## REFERENCES

- Arnold, J E M (1995) Socio-economic benefits and issues in non-wood forest products use, in FAO (ed), *Report of the International Expert Consultation on Non-Wood Forest Products, Yogyakarta, Indonesia, 17-27 January 1995*, Food and Agriculture Organization, Rome
- Barden, A, Awang Anak, N, Mulliken, T and Song, M (2000) *Heart of the Matter: Agarwood use and trade and CITES implementation for Aquilaria malaccensis*, TRAFFIC International, Cambridge
- Barnett, R (ed) (2000) *Food for Thought: The Utilization of Wild Meat in Eastern and Southern Africa*, TRAFFIC East/Southern Africa, Nairobi
- Bennett, E L and Robinson, J G (2000) *Hunting of Wildlife in Tropical Forests. Implications for Biodiversity and Forest Peoples*, Biodiversity Series - Impact Studies, World Bank, Washington DC
- Bourke, I J and Leitch, J (2000) *Trade Restrictions and Their Impact on International Trade in Forest Products*, Food and Agriculture Organization, Rome
- Burgess, J C (1992) *The Impact of Wildlife Trade on Endangered Species*, LEEC Discussion Paper 9202, International Institute for Environment and Development, London
- Caldwell, J (2001) CITES wildlife trade data. In litt to T Mulliken, TRAFFIC International, J Caldwell, UNEP-WCMC
- Campbell, B and Brigham, T (1993) *Non-wood Forest Products Zimbabwe*, paper prepared for the FAO expert consultation on non-wood forest products (anglophone Africa), Food and Agriculture Organization, Rome
- Caspary, H-U, Koné, I, Prouot, C and de Pauw, M (2001) *La Chasse et la Filière Viande de Brousse dans l'Espace Taï, Côte d'Ivoire*, Tropenbos, Abidjan
- Cavendish, M (1997) *The Economics of Natural Resource Utilisation by Communal Area Farmers of Zimbabwe*, University of Oxford
- Clarke, J, Cavendish, W and Coote, C (1996) Rural households and Miombo woodlands: use value and management, in B Campbell (ed), *The Miombo in Transition: Woodlands and welfare in Africa*, CIFOR, Bogor
- Edwards, S R (1992) Wild bird trade: perceptions and management in the Cooperative Republic of Guyana, in Thomsen, J B, Edwards, S R and Mulliken, TA (eds), *Perceptions, Conservation and Management of Wild Birds in Trade*, TRAFFIC International, Cambridge
- Edwards, D M (1993) *The Marketing of Non-timber Forest Products from the Himalayas: The Trade between East Nepal and India*. Rural Development Forestry Network, paper 156, ODI, Regent's College, London
- FAO (1995) *Non Wood Forest Products for Rural Income and Sustainable Forestry*, Non Wood Forest Products Series no 7, Food and Agriculture Organization, Rome
- FAO (2000) *The State of World Fisheries and Aquaculture 2000*, Food and Agriculture Organization, Rome
- FAO (2001a) *State of the World's Forests 2001*, Food and Agriculture Organization, Rome
- FAO (2001b) *Global Forest Resources Assessment 2000*, Food and Agriculture Organization, Rome

- FAO (2001c) *What are NWFPs?*, Food and Agriculture Organization, Rome,  
<http://www.fao.org/forestry/FOP/FOPW/NWFP/what-e.stm>, 18 January 2002
- FAO/STAT (2002). *FAO/STAT Forestry Data*,  
<http://apps.fao.org/page/collections?subset=forestry>
- Fitzgerald, S (1989) *International Wildlife Trade: Whose business is it?*, World Wildlife Fund, Washington DC
- Freese, C H (1996) *The Commercial, Consumptive Use of Wild Species: Managing it for the benefit of biodiversity*, WWF, Washington DC
- Freese, C H (1998) *Wild Species as Commodities: Managing markets and ecosystems for sustainability*, Island Press, Washington DC
- Government of the Republic of Ghana (1998) *Wildlife Development Plan 1998–2003*, Wildlife Department, Accra
- Groombridge, B (1992) *Global Biodiversity: Status of the earth's living resources*, Chapman and Hall, London
- Iqbal, M (1993) *International Trade in Non Wood Forest Products: An overview*, FAO: Misc/93/11 Working Paper, Food and Agriculture Organization, Rome
- Iqbal, M (1995) *Trade Restrictions Affecting International Trade in Non-Wood Forest Products*, Non-Wood Forest Products Series, Food and Agriculture Organization, Rome
- Kasim, I and Long, S A (2000) *The Bushmeat Trade in West Africa: A review of recent literature focusing specifically on the ecological and livelihood implications of the trade (DRAFT)*, Natural Resources Institute, Chatham
- Lange, D (1998) *Europe's Medicinal and Aromatic Plants: Their use, trade and conservation*, TRAFFIC International, Cambridge
- Lee, S (in prep) *Medicinal Plant Trade in East Asia*, TRAFFIC East Asia, Hong Kong
- Lee, S (1998) *Attitudes of Hong Kong Chinese Towards Wildlife Conservation and the Use of Wildlife as Medicine and Food*, TRAFFIC East Asia, Hong Kong
- Lee, S, Hoover, C, Gaski, A and Mills, J (1998) *A World Apart: Attitudes toward traditional Chinese medicine and endangered species in Hong Kong and the United States*, TRAFFIC East Asia, TRAFFIC North America and WWF-US, Washington DC
- Moyer, D C (1995) *The Status of Fischer's Lovebird Agapornis fischeri in the United Republic of Tanzania*, IUCN Species Survival Commission, Gland and Cambridge
- Mulliken, T A and Thomsen, J B (1995) International trade, in Abramson, J, Speer, B L and Thomsen, J B (eds), *The Large Macaw: Their care, breeding and conservation*, Raintree Publications, Hong Kong
- Nash, S V (1994) *Sold for a Song: The trade in Southeast Asian non-CITES birds*, TRAFFIC International, Cambridge
- Nasi, R and Cunningham, T (2001) *Sustainable Management of Non-Timber Forest Resources: A review with recommendations for the SBSTTA*, Secretariat to the Convention on Biological Diversity, Montreal
- Neumann, R P and Hirsch, E (2000) *Commercialisation of Non-Timber Forest Products: Review and analysis of research*, CIFOR, Bogor
- Olsen, C S and Helles, F (1997) Medicinal plants, markets and margins in the Nepal Himalaya: trouble in paradise, *Mountain Research and Development*, 17(4), 363–374.
- Parsaud, B (2001) *Efficient Monitoring of Wildlife Trade Top Priority*, Conservation International,  
[http://www.conservation.org/xp/CIWEB/programs/awards/2001/guyana/judges/entries/guy\\_02.xml](http://www.conservation.org/xp/CIWEB/programs/awards/2001/guyana/judges/entries/guy_02.xml), 18 January 2002



- Pimental, D, McNair, M, Buck, L, Pimental, M and Kamil, J (1997) The value of forests to world food security, *Human Ecology*, 25, 91-120
- Prescott-Allen, R and Prescott-Allen, C (1982) *What's Wildlife Worth? Economic Contribution of Wild Plants and Animals to Developing Countries*, IIED-Earthscan, London
- Roe, D, Mayers, J, Grieg-Gran, M, Kothari, A, Fabricius, C and Hughes, R (2000) *Evaluating Eden: Exploring the myths and realities of community-based wildlife management*, Evaluating Eden Series 8, IIED, London
- Roe, D, Mulliken, T, Milledge, S, Mremi, J, Mosha, S and Grieg-Gran, M (2002) *Making a Killing or Making a Living: Wildlife trade, trade controls and rural livelihoods*, IIED Biodiversity and Livelihoods Issues no 6
- Roth, H and Merz, G (1997) *Wildlife Resources: A global account of economic use*, Springer Verlag, Berlin
- Scoones, I, Melnyk, M and Pretty, J N (1992) *The Hidden Harvest. Wild Foods and Agricultural Systems. A Literature Review and Annotated Bibliography*, IIED, London
- UNEP (1998) *Policy Effectiveness and Multilateral Environmental Agreements*, Environment and Trade Series, UNEP Economics, Trade and Environment Unit, Geneva
- van Rijsoort, J (2000) *Non-Timber Forest Products (NTFPs): Their role in sustainable forest management in the tropics*, Theme Studies Series, National Reference Centre for Nature Management, Wageningen
- Warner, K (1995) Marketing, Valuation and Pricing of NWFPs, in Durst, P B and Bishop, A (eds), *Beyond Timber: Social, economic and cultural dimensions of non-wood forest products in Asia and the Pacific*, Proceedings of a Regional Expert Consultation, 28 November-2 December 1994, FAO/RAP, Bangkok
- WHO, IUCN and WWF (1993) *Guidelines on the Conservation of Medicinal Plants*, IUCN, Gland
- Wollenberg, E and Belcher, B (2001) NTFPs - Income for rural populations or not?, *ETFRN News*, 32(1), 30-32.



## THE TRADE IN WILDLIFE

The regulation of the trade in wildlife is failing. From the snow leopard of India to the monkey puzzle tree of South America, increasing numbers of plant and animal species are threatened with extinction despite improvements both in our understanding of the issues involved and in the management of global trade. Insight into why this is taking place, and how to halt it, is urgently needed.

*The Trade in Wildlife* provides a timely and broad-based critical assessment of how the international trade in wildlife is currently regulated, and how those regulations are enforced or, all too often, ignored. Through analysis of key case studies and a comparative look at the trade in other illegal goods, it highlights the weaknesses in the current system, shows where it is failing, and clearly outlines what must be done if conservation efforts are to be supported by trade regulations rather than undermined by them.

This is a comprehensive resource for academics and students in economics, environmental studies, law and politics and a critical text for conservationists, policy-makers and NGOs.

Contributors: Evan Bowen-Jones • Duncan Brack • Steven Broad • Neil Brodie • Rosie Cooney • Barney Dickson • Jon Hutton • Hugo Jachmann • Paul Jepson • Nigel Leader-Williams • Cyril Lombard • David Lowe • Manoj Mishra • David Morgan • Brendan Moyle • Teresa Mulliken • Marshall Murphy • Sara Oldfield • Pierre du Plessis • Dilys Roe • Nrek Sinclair-Brown • Juan Carlos Vasquez • Grahame Webb

Sara Oldfield is Global Programmes Director at Fauna & Flora International, one of the world's leading conservation organizations.

£17.95 / \$29.95

ISBN 1-85383-954-X



**EARTHSCAN**

[www.earthscan.co.uk](http://www.earthscan.co.uk)

**TRAFFIC**



**FAUNA & FLORA  
International**  
Conserving wildlife since 1903

**ResourceAfrica**