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Open, Unregulated Trade in Wildlife in Morocco's Markets

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The Kingdom of Morocco, situated on the northwestern coast of the African continent, has a population of over 32 million people. It has a relatively well-developed tourism sector, in part due to stability the region has enjoyed compared to other North African countries and its close proximity to Europe. Morocco is classified as being within the Mediterranean Basin, an area with exceptional concentrations of endemic species undergoing rapid rates of habitat loss, and is therefore considered to be a hotspot for conservation priority (Myers et al.*, 2000). It has 29 endemic species (21 reptiles and eight mammals) (Franchimont and Saadaoui, 1998) and is home to the Barbary Macaque* Macaca sylvanus, *the only non-human African primate north of the Sahara. Morocco's proximity to Europe, coupled with its porous borders, makes it a potentially important wildlife trade hub (van Lavieren, 2008). The sale of wildlife in Morocco is illegal and yet large amounts of wild fauna and flora are available for sale. This article reports on the findings of wildlife surveys undertaken during 2013 in Morocco's major cities, located in the north-west of the country.*

Background

Cursory reports suggest that unregulated wildlife trade has existed for a long time in Morocco (Lambert, 1969; Highfield and Bayley, 2007). Species such as the Mediterranean Chameleon *Chamaeleo chameleon*, Spur-thighed Tortoise *Testudo graeca* and Desert Monitor Lizard *Varanus griseus* have been used in medicine since medieval times (Alves *et al*., 2013) and are still frequently used in Morocco (Highfield and Bayley, 2007). For example, users believe chameleons hold magical powers, monitor lizards harbour the souls of ancestors, and that monitor lizard heads are a potent talisman against snake bites (Highfield and Bayley, 2007). Bell's Dabb Lizard *Uromastyx acanthinura* is thought to bring good luck to a new household; cleaned out and dried, they are used as bottles to feed babies (Highfield and Bayley, 2007). Leopard *Panthera pardus* skins have been traded in Morocco (Fogg, 1938; Cuyten, 2011) and these and the derivatives of other animals are still used in the production of souvenirs and decorations for both tourists and local people (Highfield and Bayley, 1996; Benhardouze *et al.*, 2004; Martin and Perry-

Top: Fig. 1. Skins of Nile Crocodile *Crocodylus niloticus*, African Rock Python *Python sebae* and Leopard *Panthera pardus* hanging outside a shop in Souk Laghzel in Marrakech, Morocco, April–July 2013.

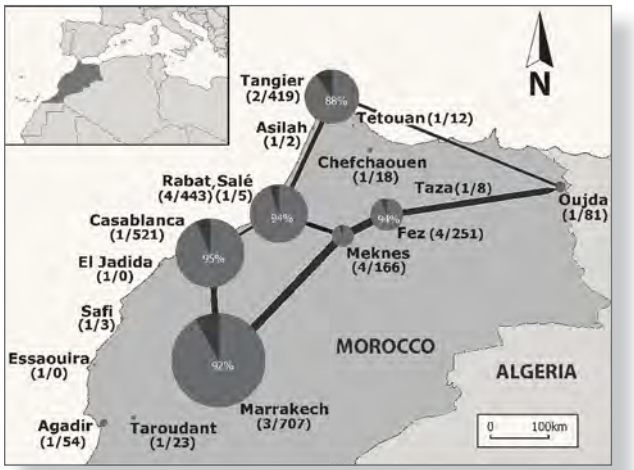

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Fig. 2. Map showing cities/towns surveyed in Morocco from July–April 2013.

Circle size represents the percentage of the overall trade in each town, with empty circles indicating no trade was observed. Thickness of lines joining towns indicates the number of species found in both towns, expressed as a percentage of the town with the smaller volume of trade. Lighter areas in the pie charts represent the number of specimens found in each town belonging to species that are protected by Moroccan law. Numbers in brackets represent the number of visits to each market (which may have encompassed several days) and total number of specimens observed in the city.

Martin, 2012). Large numbers of Spur-thighed Tortoises are traded to supply the international demand for these reptiles as pets (Znari *et al*., 2005; Shipp, 2002), as are Barbary Macaques (van Lavieren, 2008; Waters, 2011). Elephant ivory is traded in relatively small amounts (Martin and Perry-Martin, 2012).

While the illegal wildlife trade in Morocco has been widely investigated, most studies have primarily focused on one species only, are based on single visits often to just one market or on chance observations. Here, the authors report on the trade in mammals and reptiles in Morocco based on observations in 17 cities over a two-month period in 2013, with repeat surveys in five of these cities. Large quantities of specimens were observed, including 2000 live animals and hundreds of whole, stuffed animals, skins, carapaces, and horns.

Legislation

Morocco has made commitments to protect its native wildlife, although these are not always adequately enforced. The country has been a Party to CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) since 1976 but is still classified as Category 2, which means that the implementing legislation does not meet all of the Convention's requirements. The official body for wildlife conservation and management is Le Haut Commissaire aux Eaux et Forêts et à la Lutte Contre la Désertification (The High Commission for Water, Forests and Desertification Control), known as Eaux et Forêts. In January 2011, *Law No. 29-05 on the Protection of Species of Wild Flora and Fauna and their Trade* was promulgated and adopted at national level, although can only be implemented once the relevant Ministries sign the legislation.

This law meets the country's obligations under CITES and provides a list of protected species for which the importation, capture, sale, offer for sale or killing is illegal without a specific licence, with fines of up to MAD100 000 (equivalent to USD12 250 at 2013 exchange rates) for illegal trade in animals listed in CITES Appendix I. Falsifying or misusing permits can lead to fines of up to MAD50 000.

Methods

Surveys were conducted between 25 April and 4 July 2013 in all the major cities of north-west Morocco. The cities of Fez, Meknes and Rabat were each visited four times; Marrakech was visited three times; Tangier was visited twice and Salé, Essaouira, Tetouan, Chefchaouen, Casablanca, El Jadida, Safi, Agadir, Taroudant, Asilah, Taza and Oujda were each visited once. Medinas—distinct, typically walled, city sections in many North African cities in which markets are often found—were surveyed exhaustively for wildlife by the first author where these occurred and markets outside the medinas were visited when learned about. Conservatively, the first author checked several thousand shops during the seven-week survey. When possible, both daytime and evening surveys were conducted on the same day in order to minimize the chances of stalls or shops being overlooked.

The number of specimens of mammals and reptiles was recorded where possible, with only positive identifications included in this report, although wild meat was not actively searched for (and none was seen). While small amounts of ivory items were observed in Marrakech and Fez by Martin and Perry-Martin (2012), investigation into the availability of ivory items was not a focus for the current survey, investigation of which involves a different search strategy and the monitoring of antique shops and gemstone outlets.

Representative prices were obtained opportunistically. In many outlets, it was not possible to discuss the cost of items with the vendors without serious interest being shown in purchasing them, which the authors wanted to avoid. Prices of many goods in Moroccan markets tend to drop quite significantly if the customer enters into a discussion with the vendor but this was not deemed appropriate because there was concern that an interest in the wildlife could potentially stimulate the trade. Vendors also frequently become disgruntled if the item in question is not bought after the price has been lowered. Therefore only starting prices were recorded.

The official exchange rate at the time of the survey was MAD1=USD0.12. When possible, pictures were taken to confirm identification. Conservatively, animals or their parts observed during repeat visits that could represent the same item or individual were included only once. Deer antlers and porcupine quills were excluded

Species	Native to Morocco	Protected in Morocco	IUCN Red List (CITES Appendix)	Live	Whole animal	Skin / carapace	Head / Horns	Price range (USD)
Dorcas Gazelle *Gazella dorcas*	Yes	Yes	VU		5	15	48	
Wild Boar *Sus scrofa*	Yes	No	LC			3	1	
Barbary Stag *Cervus elaphus*	Re-introduced	Yes	LC				3	
Dama Gazelle *Nanger dama*	Extinct	Yes	CR (I)		1			
Red Fox *Vulpes vulpes*	Yes	Yes			2	67	1	18–144
Leopard *Panthera pardus*	Extinct*	Yes	NT (I)			37		289–2 643**
Common Genet *Genetta genetta*	Yes	No	LC			12		
Golden Jackal *Canis aureus*	Yes	Yes	LC			8		
African Wildcat *Felis silvestris*	Yes	Yes	LC (II)			3		
Serval *Leptailurus serval*	Yes	No	LC (II)			3		
Egyptian Mongoose *Herpestes ichneumon*	No		LC		1	2		
Lion *Panthera leo*	Extinct	Yes	VU (I)			2		1 202
Least Weasel *Mustela nivalis*	Yes	No	LC			2		
Striped Hyaena *Hyaena hyaena*	Yes	No	NT			1		
Barbary Macaque *Macaca sylvanus*	Yes	Yes	EN (II)	12				120–500
Barbary Ground Squirrel *Atlantoxerus getulus*	Yes	No	LC	48				21
North African Hedgehog *Atelerix algirus*†	Yes	No	LC	11		30		
Crested Porcupine *Hystrix cristata*	Yes	No	LC			6		
Armadillo *Dasypus* sp.	No				1			
European Otter *Lutra lutra*	Yes	Yes	NT (I)			1		
Spur-thighed Tortoise *Testudo graeca*	Yes	Yes	VU (II)	1650		72		1–4
Chameleon *Chamaeleo chamaeleon*	Yes	Yes	LC (II)	103	314			6–48
Bell's Dabb Lizard *Uromastyx acanthinura*††	Yes	Yes	(II)	34	115	3		12–24
African Rock Python *Python sebae*	No		(II)			54		289
Nile Crocodile *Crocodylus niloticus*	No		LC (I/II)		8	12		
European Pond Terrapin *Emys orbicularis*	Yes	No	NT	12				2–6
Desert Monitor Lizard *Varanus griseus*	Yes	Yes	(I)	2	5			7
Unidentified turtle Cheloniidae sp.	Yes	Yes	(I)			I		

Table 1. Species found in the markets of 17 cities/towns in Morocco from April–July 2013, showing status in Morocco, national and international protection status, the form in which they were being sold and representative prices, given in US dollars (exchange rate 1 MAD=0.12 USD).

Key: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered (Source: IUCN Red List (2014). Notes: * Reports from 2003 suggest a possible small relict population of five individuals (Cuzin, 2003); **More expensive specimens were larger and of significantly better quality; †Live individuals were all identified as North African Hedgehog *Atelerix algirus*; skins could potentially have been either this species or Desert Hedgehog *Paraechinus aethiopicus*; ††The most likely *Uromastyx* species in trade although other *Uromastyx* lizards may also have been present.

from the survey as they could have been shed naturally. Cities and towns were compared in terms of overall numbers and the variety of wildlife sold.

The percentage overlap of wildlife species for sale in nearby towns was determined by establishing what percentage of the species present in the smaller market was present in the larger market.

Results

The majority of wildlife on sale in the markets surveyed tended to be concentrated in one area. Outside this area, specimens were more dispersed but still present. In total, 171 shops were found selling wildlife or wildlife-derived products in all but two cities—Essaouira and El Jadida—although further investigations in these two cities may uncover wildlife for sale. Wildlife was displayed prominently in the shops in which it was sold, often being hung on the façade of the shop or placed at the front of the stall (Fig. 1). Fake pelts, of which a large number were observed, were generally easily identifiable and vendors did not claim that they were real and even readily supplied the information that they were painted when enquiries were made. Vendors freely offered to sell the products to tourists, often claiming it was legal or "not a problem" to bring across international borders. Shops in which wildlife was observed almost always sold other products as well, and in most cases these products were the ones being offered by vendors to the first author.

Marrakech was found to be the city with the most trade, with 707 specimens offered for sale, almost 200 specimens more than Casablanca, the next largest centre for trade. There were two main areas of wildlife trade in Marrakech—one in Souk Laghzel in the main tourist thoroughfare catering to tourists and locals alike, and one in Mellah, the "spice market", which appeared to be more medicinally orientated and targeted more towards local customers. The level of wildlife trade in the city of Taroudant was relatively low but the authors observed a significant number of Leopard skins (nine out of the total of 37 recorded during the survey), including ones hidden from view by other Leopard skins and which could not be counted.

The live animal trade comprised eight species and 1872 individuals, the most numerous of which were Spur-thighed Tortoises (1650) followed by Mediterranean Chameleons (103). Trade in animal parts involved 25 species, the most numerous of which were Mediterranean Chameleons (314 items) and Bell's Dabb Lizard (118 items). A summary of the observed trade is given in Table 1. The majority (96%) of trade observed was in species native to Morocco, with 118 of the specimens belonging to species from elsewhere, including ones that have become extinct in Morocco. Almost 93% of the animals native to Morocco seen in the markets during this study are protected under Moroccan law.

Some cities exhibited a strong overlap in species composition—up to 100%—whereas others displayed different sets of species in their markets. The time spent in each city, the percentage of animals of protected species relative to the overall numbers of animals seen, the relative importance of each city in the trade, and the percentage of species shared between cities is represented in Fig. 2.

Discussion

This is one of the first detailed surveys of wildlife trade in Morocco, focusing on all species being offered for sale with the exception of elephant ivory and wild meat. The number of species observed, and for many individual species the number of individuals or items observed, are significantly larger than previous single species or single market reports suggest. Open trade was observed in 15 of the 17 towns visited, with particularly large volumes of trade in Marrakech, Casablanca, Rabat and Tangier. This widespread openness of the trade is suggestive of a lack of prosecution as the vendors evidently see no reason to hide the goods.

A high number of specimens and a wide range of carnivore species were observed. Red Fox *Vulpes vulpes* skins were particularly abundant despite their protected status in Morocco. It was especially disconcerting to observe 37 Leopard skins in the markets given that the Leopard has been extirpated from most, if not all of Morocco (Cuzin, 2003). The authors found Marrakech and Taroudant to be centres of the Leopard skin trade. Shipp (2002) observed 17 Leopard skins in Marrakech in an unknown number of shops. Cuyten (2011) observed eight Leopard skins in Marrakech compared to the 10 seen during the current survey. By comparing photographs taken in 2011 and sent to the authors by K. Cuyten, it appears that between four and seven of the shops observed selling Leopard skins during this survey no longer do so, or sell fewer than previously observed. The authors were not able to find any recent reports of trade in Lion *Panthera leo* skins within Morocco and given that the species became extinct in the country at least 50 years ago (Black *et al*., 2013), the skins most likely had been imported from elsewhere in Africa. Only two Leopard and one Lion-derived products have been legally imported as hunting trophies and for personal use into Morocco over the last decade (Anon., 2013).

Of the ungulates, only Dorcas Gazelle *Gazella dorcas* occurred in abundance, the horns in particular. The total number of Dorcas Gazelles in Morocco has been estimated at between 200 and 800 individuals (Cuzin, 2003) suggesting that the 61 individuals observed during this survey may represent 8–30% of the remaining population if they were not imported specimens. The presence of a single Dama Gazelle *Nanger dama* is significant as the species is classified as Critically Endangered and the Moroccan population is very likely extinct in the wild (Cuzin *et al*., 2007).

Reptiles were overwhelmingly the most numerous live animals for sale in the markets and Spur-thighed Tortoises were found in especially large numbers. The latest assessment of this species for the *IUCN Red List of Threatened Species* was undertaken in 1996 and needs updating. The authors' data suggest that trade could be a clear threat to local populations of this species. From the one market—Marrakech—for which quantitative

Fig. 3. A stand in Meknes, Morocco, selling medicinals which included animal products, observed between April and July 2013.

Photograph: Daniel Bergin

comparative data are available, it appears that numbers of tortoises are lower than they were in 2001 (Shipp, 2002; Znari *et al*., 2005). At a global level, Mediterranean Chameleons have recently been assessed as being of Least Concern (Vogrin *et al.*, 2012), but the data from the Moroccan markets may suggest that, at the local level, trade could have a significant impact on their conservation. In fact, if all the stuffed chameleons observed are derived from populations close to the trading centres, this may lead to local extinctions.

Comparing the present survey to previous ones, it is relevant to note where and how the trade in wildlife has changed over time. For example, in the thousands of shops surveyed, only 32 banjos constructed using the carapaces of Spur-thighed Tortoises (also known as tortoiseshell banjos) were observed, in 15 shops, and, judged separately, this did not appear to be an important component of the wildlife trade in Morocco. In the past, this was clearly very different. Lambert (1969) referred to large numbers of tortoiseshell banjos produced in Tetouan and estimated that annually around 10 000 Spur-thighed Tortoises were killed to supply the demand for this trade. Highfield and Bayley (1996), citing an unpublished report from 1983, reported that each of a large number of souvenir shops in Agadir, Marrakech and Tangier, typically had 10 to 20 carapace banjos on display. The total number observed in these towns amounted to some 1500 over a two-month period. Based on their cursory observations in the early 1990s, Highfield and Bayley (1996) stated that the observations from 1983 accorded closely with their own experiences and suggested that the scale of this trade had not diminished between the 1980s and 1990s. However, it is apparent from the current surveys that a clear change in use has occurred over the last two decades. Given that large numbers of specimens of this species are observed in trade, the decline in the number of tortoiseshell banjos on sale is most likely owing to a change in demand, possibly attributable to these items falling out of fashion.

Trade routes

Over 100 specimens, representing seven species, are not (or are no longer) native to Morocco and therefore must have been imported. In all but one case (Armadillo *Dasypus* sp.), these animals have ranges that include Central or West Africa. This suggests a potential trade route in or through this area. Leopards, Lions and crocodiles have been declared extinct in Morocco and the trade in these species is likely to be of specimens that are either very old or have been imported. Although some of the Leopard skins, especially those in Taroudant, were in a poor condition—potentially attributable to age—those in Fez and Marrakech appeared fresher. The high numbers of Leopard skins in Taroudant could also indicate trade routes from the south, although this hypothesis is not upheld by the complete lack of Leopard skins in Agadir, where vendors claimed not to believe that they could be bought in Morocco. The number of specimens of each species shared between cities does not provide a strong-enough basis for assumptions and no obvious conclusion can be drawn from the amount of crossover of species between cities.

THE NUMBER OF DORCAS GAZELLES *GAZELLA DORCAS* OBSERVED DURING THE SURVEY IS ESTIMATED TO REPRESENT BETWEEN 8-30% OF MOROCCO'S POPULATION OF THIS SPECIES.

DORCAS GAZELLES: MARTIN HARVEY / WWF-CANON

Conclusions and Recommendations

The amount of wildlife found in trade in the 15 cities surveyed in Morocco is substantial. Due to the methodologies employed in the survey and the nature of the trade, the real volumes of live animals are frequently underrepresented in market surveys as they do not account for animals used or sold before they reach the markets (Allebone-Webb *et al.*, 2011; Perez *et al*., 2004). For selected species, such as Leopards, Dorcas Gazelles or Spur-thighed Tortoises, the volumes observed clearly indicate that trade may have a significant negative impact on these species. Furthermore, the observations of species that have been declared extinct in Morocco, as well as Critically Endangered species, are of particular concern.

The trade in wild animals in Morocco is an illegal activity and should be treated as such. Very few shops were exclusively selling wildlife and, for most, the volume of non-wildlife products was substantially larger than that of wildlife products. For many traders, wildlife appeared to be an auxiliary business and the display of wildlife, in particular of skins—which have a lower turnover in sales compared with live animals—is a means to draw in customers. Stricter controls and more rigorous implementation of the new wildlife protection legislation by officials at Eaux et Forêts should lead to a further shift away from the sale of wildlife products without having too much of a negative impact on the livelihood of most traders. This shift would be further facilitated by effective prosecution of offenders and appropriate sentencing. Although it is reported (Anon., pers comm., 6 March 2014) that no wildlife or related products are openly on display in Ceuta, the authors recommend that any future wildlife trade surveys conducted in Morocco include the exclaves of Ceuta and Melilla. For example, Benhardouze *et al.* (2004) investigating the marine turtle trade in Morocco, reported trade links to Ceuta. As autonomous Spanish (and therefore European) cities in North Africa, the flow of wildlife through these centres would have direct relevance for international wildlife trafficking.

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