



Original Article

Illegal trade in wildlife vertebrate species in the West Bank, Palestine

Elias N. Handal^{a,*}, Zuhair S. Amr^b, Walid S. Basha^{c,d}, Mazin B. Qumsiyeh^a^a Palestine Institute for Biodiversity and Sustainability (PIBS), Palestine Museum of Natural History (PMNH), Bethlehem University, Bethlehem, Palestine^b Department of Biology, Jordan University of Science & Technology, Irbid, Jordan^c Faculty of Medicine and Health Sciences, Unit of Biodiversity, An-Najah National University, Nablus^d Palestine and Basha Scientific Center for Research and Studies, Jenin, Palestine

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ABSTRACT

A total of 79 species of local vertebrates (birds, mammals, and reptiles) are found to be in illegal trade in the West Bank, Palestine, during 2013–2020. Data were collected from visits to the animal markets in the main cities of the West Bank (Bethlehem, Hebron, Jenin, Jericho, Nablus, Ramallah, and Salbit) and from advertisements in social media. Birds were the most traded animals represented in 59 species (74.7%), followed by 12 species of reptiles (15.2%) and eight species of mammals (10.1%). Nineteen species are listed under CITES appendices (17 birds and 2 mammals under appendixes II and III, respectively). As for the conservation status according to the IUCN Red List, two bird species (*Streptopelia turtur* and *Serinus syriacus*) and one reptile (*Testudo graeca*) are listed as VU, while two mammals (*Hyaena hyaena* and *Gazella gazella*) are listed as NT and EN, respectively. Based on the local status, three species of bird are considered critically endangered (*Coturnix coturnix*, *Asio flammeus*, and *Aquila chrysaetos*), one bird is endangered (*Falco subbuteo*), and two mammals (*Hyaena hyaena* and *Gazella gazella*) are considered endangered and vulnerable respectively. This study reveals the urgent need to control animal trade in the Palestinian Territories.

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Introduction

Animal trade with local species is a problem facing nature conservation efforts, especially in several countries in the Middle East such as Iraq (Bachmann 2010), Jordan (Eid et al. 2011), Lebanon (Dakdouk 2009; Abi-Said et al. 2018), Kuwait (Al-Sirhan and Al-Bathali 2010), Saudi Arabia (Aloufi and Eid 2014), Syria (Amr et al. 2007), Turkey (Turkozian and Kiremi 2007) and the United Arab Emirates (Soorae et al. 2008), and also in North Africa, including Algeria (Nijman et al. 2019; Razkallah et al. 2019) and Morocco (Bergin and Nijman 2018).

The Occupied Palestinian territories have a unique situation in terms of jurisdiction. The areas were occupied by Israel in 1967. The Palestinian Authority was created as a self-governing body in 1994 and proceeded to consider itself a “State” and was recognized by the UN General Assembly as a nonvoting “State.” It has since signed a number of international conventions and agreements, including

the Convention on Biological Diversity but not other conventions like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

With the absence of a legal framework for wildlife protection in the Palestinian territories due to several constraints, especially the Israeli occupation and lack of proper enforcement, trade in local wildlife species is taking its toll on the native species. This study reveals the magnitude of trade in local vertebrates in the Palestinian Territories

Material and methods

More than 20 local markets were visited from 2013 to 2020, covering major cities in the West Bank (Bethlehem (six markets and 56 visits), Hebron (five markets and 18 visits), Jenin (One market and three visits), Jericho (two markets and 17 visits), Nablus (two markets and six visits), Ramallah (two markets and 12 visits) and Salbit (two markets and four visits)). Additionally, we monitored five groups related to animal trades on Facebook at least twice a month (the most widely used social media platform in Palestine) for advertisements for wild animals offered for sale. During each visit to the local markets, we documented animal species and the

* Corresponding author.

E-mail address: eliashandal93@gmail.com (E.N. Handal).

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Table 1. Vertebrates in the illegal trades in the West Bank, Palestine, show the CITES, IUCN, and local status of each species.

Family	Scientific Name	Common Name	CITES Status	IUCN Status	Local Status	No. of animals	No. of markets	No. in Facebook
Accipitridae	<i>Accipiter gentilis</i>	Goshawk	II	LC	NE	1	0	1
	<i>Accipiter nisus</i>	Sparrowhawk	II	LC	LC	16	3	3
	<i>Aquila chrysaetos</i>	Golden Eagle	II	LC	CR	2	1	1
	<i>Buteo buteo</i>	Common Buzzard	II	LC	NT	5	4	1
	<i>Buteo rufinus</i>	Long-Legged Buzzard	II	LC	NT	11	5	2
	<i>Circaetus gallicus</i>	Short-Toed Eagle	II	LC	LC	5	1	1
	<i>Elanus caeruleus</i>	Black-Winged Kite	II	LC	NE	8	1	5
	<i>Milvus migrans</i>	Black Kite	II	LC	RE	13	1	1
	Alaudidae	<i>Galerida cristata</i>	Crested Lark	NC	LC	LC	5	1
Alcedinidae	<i>Alcedo atthis</i>	Common Kingfisher	NC	LC	NE	1	1	0
Anatidae	<i>Anas platyrhynchos</i>	Mallard	NC	LC	LC	123	11	6
Apodidae	<i>Apus apus</i>	Common Swift	NC	LC	DD	2	2	0
Ardeidae	<i>Botaurus stellaris</i>	Bittern	NC	LC	NE	1	1	0
Columbidae	<i>Columba livia</i>	Feral Dove	NC	LC	DD	>500	20	6
	<i>Oena capensis</i>	Namaqua Dove	NC	LC	LC	31	15	6
	<i>Streptopelia decaocta</i>	Collared Dove	NC	LC	LC	20	14	6
	<i>Streptopelia senegalensis</i>	Laughing Dove	NC	LC	LC	>500	20	6
	<i>Streptopelia turtur</i>	Turtle Dove	NC	VU	NT	18	7	3
Corvidae	<i>Garrulus glandarius</i>	Jay	NC	LC	LC	3	2	0
Cuculidae	<i>Clamator glandarius</i>	Great Spotted Cuckoo	NC	LC	LC	1	0	1
Estrildidae	<i>Euodice malabarica</i>	Indian Silverbill	NC	LC	LC	>500	5	2
Falconidae	<i>Falco naumanni</i>	Lesser Kestrel	II	LC	NT	7	6	1
	<i>Falco subbuteo</i>	Hobby	II	LC	EN	1	1	0
	<i>Falco tinnunculus</i>	Kestrel	II	LC	LC	42	13	1
Fringillidae	<i>Carduelis cannabina</i>	Linnet	NC	LC	LC	>500	17	4
	<i>Carduelis carduelis</i>	Goldfinch	NC	LC	LC	>500	20	6
	<i>Carduelis chloris</i>	Greenfinch	NC	LC	LC	>500	17	6
	<i>Carduelis spinus</i>	Siskin	NC	LC	NE	>500	15	6
	<i>Coccothraustes coccothraustes</i>	Hawfinch	NC	LC	NE	7	1	1
	<i>Fringilla coelebs</i>	Chaffinch	NC	LC	NE	17	4	3
	<i>Fringilla montifringilla</i>	Brambling	NC	LC	NE	3	1	1
	<i>Myiopsitta monachus</i>	Monk Parakeet	II	LC	NE	>500	16	6
	<i>Serinus serinus</i>	Serin	NC	LC	LC	17	1	0
	<i>Serinus syriacus</i>	Syrian Serin	NC	VU	VU	23	1	0
Laniidae	<i>Lanius senator</i>	Woodchat Shrike	NC	LC	LC	1	1	0
Meropidae	<i>Merops apiaster</i>	European Bee-Eater	NC	LC	VU	1	1	0
Motacillidae	<i>Motacilla alba</i>	White Wagtail	NC	LC	VU	1	1	0
Muscicapidae	<i>Erithacus rubecula</i>	Robin	NC	LC	NE	1	1	0
Nectariniidae	<i>Cinnyris osea</i>	Palestine Sunbird	NC	LC	LC	7	1	0
Passeridae	<i>Passer domesticus</i>	House Sparrow	NC	LC	LC	>500	13	2
Paridae	<i>Parus major</i>	Great Tit	NC	LC	LC	6	1	1
Phasianidae	<i>Alectoris chukar</i>	Chukar	NC	LC	LC	>500	16	2
	<i>Ammoperdix heyi</i>	Sand Partridge	NC	LC	LC	34	2	0
	<i>Coturnix coturnix</i>	Quail	NC	LC	CR	1	1	0
	<i>Francolinus francolinus</i>	Black Francolin	NC	LC	LC	4	1	0
	Psittacidae	<i>Psittacula krameri</i>	Rose-ringed Parakeet	NC	LC	NE	>500	17
Pycnonotidae	<i>Pycnonotus xanthopygus</i>	White-Spectacled Bulbul	NC	LC	LC	>500	13	2
Rallidae	<i>Burhinus oedicnemus</i>	Stone Curlew	NC	LC	LC	1	1	0
Strigidae	<i>Gallinula chloropus</i>	Moorhen	NC	LC	LC	3	2	0
	<i>Asio flammeus</i>	Short-eared Owl	II	LC	CR	2	1	0
	<i>Athene noctua</i>	Little Owl	II	LC	LC	33	5	2
	<i>Asio otus</i>	Long-eared Owl	II	LC	LC	1	1	0
	<i>Bubo bubo</i>	Eagle Owl	II	LC	LC	14	7	3
Sturnidae	<i>Tyto alba</i>	Barn Owl	II	LC	LC	70	12	3
	<i>Acridotheres tristis</i>	Common Myna	NC	LC	NE	>500	20	5
Turdidae	<i>Sturnus vulgaris</i>	Starling	NC	LC	NE	12	1	0
	<i>Turdus merula</i>	Blackbird	NC	LC	LC	11	3	0
Turdidae	<i>Turdus philomelos</i>	Song Thrush	NC	LC	NE	1	1	0
	<i>Upupa epops</i>	Hoopoe	NC	LC	LC	7	1	0
Reptiles								
Colubridae	<i>Dolichophis jugularis</i>	Large Whip Snake	NC	LC	LC	7	3	0
	<i>Eirenis decemlineatus</i>	Lined Dwarf Racer	NC	LC	LC	7	4	0
	<i>Eirenis rothi</i>	Roth's Dwarf Snake	NC	LC	LC	1	1	0
	<i>Hemorrhois nummifer</i>	Asian Racer Snake	NC	LC	LC	19	6	2
	<i>Natrix tessellata</i>	Dice Snake	NC	LC	NT	2	1	0
	<i>Platyceps collaris</i>	Red Whip Snake	NC	LC	LC	1	1	0
	<i>Rhynchocalamus melanocephalus</i>	Palestine Kukri Snake	NC	LC	LC	1	1	0
	Geoemydidae	<i>Mauremys rivulata</i>	Western Caspian Turtle	NC	NE	LC	>80	3
Lamprophiidae	<i>Micrelaps muelleri</i>	Muller's Two-Headed Snake	NC	LC	VU	1	1	0
Psammophiidae	<i>Malpolon insignitus</i>	Montpellier Snake	NC	NE	LC	1	1	0
Testudinidae	<i>Testudo graeca</i>	Mediterranean Spur-thighed Tortoise	II	VU	VU	>150	13	3
	<i>Daboia palaestinae</i>	Palestine Viper	NC	LC	LC	3	2	1

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Table 1 (continued)

Family	Scientific Name	Common Name	CITES Status	IUCN Status	Local Status	No. of animals	No. of markets	No. in Facebook
Mammals								
Bovidae	<i>Gazella gazella</i>	Mountain Gazelle	NC	EN	VU	22	1	3
Canidae	<i>Vulpes vulpes</i>	Red Fox	III	LC	LC	3	1	1
Erinaceidae	<i>Erinaceus concolor</i>	Eastern European Hedgehog	NC	LC	LC	9	3	0
	<i>Hemiechinus auritus</i>	Long-eared Hedgehog	NC	LC	VU	7	2	0
Hystriidae	<i>Hystrix indica</i>	Indian Crested Porcupine	NC	LC	LC	19	4	1
Hyaenidae	<i>Hyaena hyaena</i>	Striped Hyena	III	NT	EN	1	1	0
Leporidae	<i>Lepus capensis</i>	Arabian Hare	NC	LC	LC	3	1	0
Procaviidae	<i>Procavia capensis</i>	Rock Hyrax	NC	LC	LC	18	1	0

Abbreviations: CR: critically endangered; DD: data deficient; EN, endangered; LC: least concerned; NC: Non – CITES; NE: not evaluated; NT: near threatened; RE: extinct as a breeder; VU: vulnerable; II: appendix II; III: appendix III; IUCN: International Union for Conservation of Nature; CITES: Convention on International Trade in Endangered Species.

number of individuals in trade. For each species, its category under the Convention on International Trade in Endangered Species (CITES), the International Union for Conservation of Nature (IUCN) Red List of Threatened Species categories global conservation status and its local status according to Meiri et al. (2019) are listed.

Results

Seventy-nine vertebrate species belong to 40 families (28 birds, 5 reptiles, and 7 mammals) were observed in the local animal markets or in the social media pages (Table 1). Birds constituted the majority of traded animals (59 species, 74.7%), followed by reptiles (12 species, 15.2%) and then mammals (eight species, 10.1%) (Figures 1 and 2).

Birds of the family Fringillidae are the most traded species in the local market in the West Bank. More than 500 Golden Finch, *Carduelis carduelis*, were offered for sale for the purpose of breeding and hybridization with domesticated canaries. Two golden eagles (*Aquila chrysaetos*) were offered for sale at \$500 to 1300, taken from their nests; one from Bethlehem (April 2014) and a second from Hebron (July 2017). Other golden eagles were found injured and were delivered by the Environmental Quality Authority (EQA) to the rehabilitation unit at the Palestine Institute for Biodiversity and

Sustainability (PBS) at Bethlehem University. These birds were rehabilitated and then released to nature in early 2020 in Duma village, northeast of Ramallah. Other species with global and local conservation status include the Hobby, *Falco subbuteo*, the Turtle Dove, *Streptopelia turtur*, Short-eared Owl, *Asio flammeus*, and the Quail, *Coturnix coturnix* (Table 1). Wild birds involved in illegal trade include 17 species of birds (28.9%) listed under Appendix II of CITES, including three species of owls and several raptors (Tables 1 and 2).

As for the conservation status, the Syrian Serin, *Serinus syriacus*, Turtle Dove, *S. turtur*, are considered vulnerable at the global level, while the Golden Eagle, *A. chrysaetos* and the Quail, *C. coturnix* is critically endangered, The Turtle Dove, Long Legged Buzzard, Common Buzzard, and Lesser Kestrel are listed as near threatened, and the Hobby is endangered (Table 1).

Reptiles are represented by 12 local species belonging to six families (Table 1). The Spur-thighed Tortoise, *Testudo graeca* (with over 150 specimens), is offered in the local markets. This species is considered vulnerable according to the IUCN RedList and listed in Appendix II under CITES. The Dice Snake, *Natrix tessellata*, is listed as near threatened at the local level (Table 2).



Figure 1. Some wild birds found in local animal markets from Jenin, Palestine: A, Short-eared Owl; B, Common Kestrel; C, Long-legged Buzzard; D, Chukar Partridge.



Figure 2. A, Striped Hyena (about 6 months old, brought by the Environmental Police from the animal market for rehabilitation at PIBS); B, Indian Crested Porcupine (from Kufr Al Deek Village); C, Palestine Viper (from Hebron); D, Mediterranean Spur-thighed Tortoise (from Bethlehem).

Table 2. Summary for CITES and non-CITES animal trade in local animal markets and social media in the Palestinian Territories.

	CITES		Non - CITES	
	No.	%	No.	%
Birds	17	28.9	42	71.1
Reptiles	1	8.3	11	91.7
Mammals	2	25	6	75
Total	20	25.3	59	74.7

Mammals are represented by eight species belong to seven families (Table 1). The Red Fox, *Vulpes vulpes*, and the Striped Hyena, *H. hyaena*, are listed in Appendix III under CITES. The Striped Hyena is offered at a price reaching \$2700) is near threatened according to the IUCN Red List and endangered at the local level, while the Mountain Gazelle, *Gazella gazella* (with over 20 specimens) is listed as endangered according to the IUCN Red List and vulnerable under the local level.

Discussion

The present study is the first of its kind to address illegal trade in local wildlife species in the occupied Palestinian territory of the West Bank. The illegal trade and harvesting of wildlife from nature is increasing due to several issues, including socioeconomic stress caused by occupation and lack of environmental awareness (Abi-Said et al. 2018). In most cases, birds are in demand by hobbyists and constitute the larger sector of illegal trade both in our study and in studies in several countries nearby (Soorae et al. 2008; Eid et al. 2011; Aloufi and Eid 2014; Abi-Said et al. 2018).

Four species of invasive birds (Rose-ringed Parakeet, *Psittacula krameri*, Monk Parakeet, *Myiopsitta monachus*, Indian Silverbill, *Euodice malabarica*, and the Common Myna, *Acridotheres tristis*) are already well established in the Palestinian Territories and are now in trade in the animal markets in the West Bank. Handal and Qumsiyeh (2021) showed the distribution of the Common Myna bird in the West Bank and its negative impact on native birds and its common sale in markets.

Other animals are captured for their meat and use in traditional medicine (Long-eared Hedgehog, Rock Hyrax, Mountain Gazelle, and the Indian Crested Porcupine) or for keeping in private gardens (Striped Hyena and Mountain Gazelle).

Harvesting and hunting wildlife species from their natural habitats will certainly drain their resources and will eventually cause decline in their population to a level that may lead to their local extinction. This is certainly true in many Middle Eastern countries, whereas three species of gazelles are considered either critically endangered or locally extinct in places like Jordan due to massive hunting (Amr 2012).

Article No. 41, of the Palestinian Environmental Law (No. 7 of 1999) stated that “it is prohibited to hunt, kill, or capture birds, wild and marine animals, and fish specified in the executive regulations of this law, and it is prohibited to possess, transport, roam, sell or display these birds and animals or offer them for sale, live or dead, and it is prohibited to destroy their dens or destroy their eggs.” Yet there are limited enforcement efforts, and only in the past three years, a “green” unit of the Palestinian Police has been created. Together with offices of the Environment Quality Authority (EQA), these efforts are a good beginning to control illegal trade in wildlife in the Palestinian Territories. The EQA is responsible for seizing illegally traded animals and monitor trade in the Occupied Palestinian Territories. We thus aimed to examine issues of trade in wild animals. We believe such studies will provide policymakers with

the data needed to decide to join treaties such as CITES and to formulate better local environmental laws. For example, the state of Palestine is now engaged in updating the environmental law of 1999, and our data should provide resources to the State of Palestine in this regard.

The Palestine Institute for Biodiversity and Sustainability (PIBS) and the Palestine Museum of Natural History (PMNH) at Bethlehem University established a rehabilitation unit and worked together with the Environmental Quality Authority (EQA) to rehabilitate captured or injured animals. On some occasions, the Environmental Police will confiscate animals that, in turn, would be sent to PIBS for evaluation, and in most cases, rehabilitation and release. This included just in the past two years, a golden eagle and three Eagle owls. A Striped Hyena was brought by the EQA from Hebron (6 months of age), rehabilitated/trained for ten months, and then released to nature (Handal et al. 2019).

This study draws attention to the need for stronger measures against illegal animal trade in the Palestinian Territories. This can be accomplished by monitoring and inspecting the local markets and social media regularly by the authorities, including the newly established police units working with the Environment Quality Authority. We also recommend educating judges and lawyers and publicizing judgments in ways that may deter violators.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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