



# Ostrich

Journal of African Ornithology

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/tost20>

## The trade in the endangered African Grey Parrot *Psittacus erithacus* and the Timneh Parrot *Psittacus timneh* in Algeria

Sadek Atoussi, Daniel Bergin, Imane Razkallah, Vincent Nijman, Mouslim Bara, Zihad Bouslama & Moussa Houhamdi

To cite this article: Sadek Atoussi, Daniel Bergin, Imane Razkallah, Vincent Nijman, Mouslim Bara, Zihad Bouslama & Moussa Houhamdi (2020) The trade in the endangered African Grey Parrot *Psittacus erithacus* and the Timneh Parrot *Psittacus timneh* in Algeria, Ostrich, 91:3, 214-220, DOI: [10.2989/00306525.2020.1763492](https://doi.org/10.2989/00306525.2020.1763492)

To link to this article: <https://doi.org/10.2989/00306525.2020.1763492>



Published online: 01 Sep 2020.



Submit your article to this journal [↗](#)



Article views: 100



View related articles [↗](#)




View Crossmark data [↗](#)



Citing articles: 2 View citing articles [↗](#)

# The trade in the endangered African Grey Parrot *Psittacus erithacus* and the Timneh Parrot *Psittacus timneh* in Algeria

Sadek Atoussi<sup>1,2\*</sup> , Daniel Bergin<sup>2</sup>, Imane Razkallah<sup>3,4</sup>, Vincent Nijman<sup>2</sup>, Mouslim Bara<sup>1</sup>, Zihad Bouslama<sup>3,4</sup> and Moussa Houhamdi<sup>1</sup>

<sup>1</sup> Laboratoire de recherche Biologie Eau et environnement 'LBEE' Université 8 Mai 1945 Guelma, Algeria

<sup>2</sup> Oxford Wildlife Trade Research Group, Oxford Brookes University, Oxford, United Kingdom

<sup>3</sup> Centre de recherche en environnement, Université Badji Mokhtar Annaba, Algeria

<sup>4</sup> Laboratoire d'écologie des systèmes terrestres et aquatiques 'ECOSTAQ' Université Badji Mokhtar Annaba, Algeria

\*Correspondence: [atoussi.sadek@univ-guelma.dz](mailto:atoussi.sadek@univ-guelma.dz)

The global wildlife trade is considered one of the main threats to the conservation of a large number of imperilled species. African Grey parrots are one of the most heavily traded groups of birds, which led the International Union for Conservation of Nature (IUCN) to list the species as Endangered in 2016. We aim to gain insight into the nature of the Timneh and African Grey parrots' trade in physical markets, pet shops, and e-commerce platforms. In a 15-month online survey of Algeria's largest e-commerce platform, we recorded 269 advertisements offering a minimum of 561 grey parrots for sale. We visited 13 street markets and 81 pet shops in 27 Algerian cities, and recorded 74 grey parrots in 15 of these. Interviews with online sellers indicate that the majority of grey parrots offered for sale were wild-sourced, and that half of the sellers are unaware that the grey parrot trade is illegal.

## Le commerce du perroquet gris du Gabon *Psittacus erithacus* et du perroquet Timneh *Psittacus timneh*, deux espèces menacées, en Algérie.

Le commerce d'animaux et de plantes sauvages constitue une menace importante pour la conservation de nombreuses espèces. Les perroquets gris africains, sont parmi le groupe d'oiseaux les plus menacés par le commerce, ce qui a conduit l'union internationale de la conservation de la nature (UICN) en 2016 à lister l'espèce comme étant en danger. L'objectif de ce travail est d'avoir un aperçu sur le commerce des perroquets gris africains dans les marchés de rues, les animaleries et dans les plateformes de e-commerce. En 15 mois d'enquête sur la plus grande plateforme de e-commerce en Algérie, nous avons enregistré 269 annonces offertes à la vente un minimum de 561 perroquet gris africains. Nous avons aussi visités 13 marchés des rues et 21 animaleries dans 27 villes Algériennes, ou nous avons notés 75 perroquets africains mis en vente dans 15 de ces villes. Les interviews conduites avec les vendeurs en ligne ont indiqués que la majorité des perroquets africains mis en vente sont de source sauvage, et que la moitié des vendeurs ne sont pas au courant que le commerce des perroquets africains est illégale en Algérie.

**Keywords:** markets surveys, North Africa, online trade, *Psittacus* parrots, wildlife trade

## Introduction

Once considered a single species, the African Grey Parrot *Psittacus erithacus* and the Timneh Parrot *Psittacus timneh* are now recognised as two distinct species; they are the only two species in the genus *Psittacus* (Del Hoyo et al. 2014). The Timneh Parrot ranges in West Africa from Guinea-Bissau east through southern Guinea, Sierra Leone, and Liberia east to at least 70 km east of the Bandama River in the Ivory Coast (BirdLife International 2018a). The African Grey Parrot ranges in a narrow band across Central Africa from the south-eastern Ivory Coast in the west to Kenya in the east (BirdLife International 2018b). In 2016, both species were reassessed from Vulnerable to Endangered, according to the International Union for the Conservation of Nature (IUCN) Red List of Threatened

Species, in part, because of the recognition that the international trade posed a larger threat to the species than had been previously anticipated.

Parrots (Psittaciformes) are one of the most popular orders of birds in trade (Pires 2012; Mundy-Taylor 2013; Bush et al. 2014; IFAW 2014; Can et al. 2019), and the increase in protection in recent years is largely because of the threats posed by the unsustainable offtake from the wild (Annorbah et al. 2016; BirdLife International 2018a, 2018b). *Psittacus* parrots (hereafter 'grey parrots') are traded in their home range for food (Fa et al. 2006) and medicine (Sodeinde and Soewu 1999; Alves and Rosa 2013; Atuo and O'Connell 2015), and are traded internationally as pets (e.g. Jordan: Eid et al. 2011; Indonesia: Chng et al. 2015;

Singapore: Poole and Shepherd 2017; Thailand: Chng and Eaton 2016). Although they lack the colourful plumage that many parrot owners find attractive (Frynta et al. 2010), grey parrots have large bodies and can imitate human speech, making them desirable and valuable in the pet trade (Tella and Hiraldo 2014; Olah et al. 2016). Of the threats posed by trade to grey parrots, the international pet trade is the most significant (BirdLife International 2018a, 2018b).

Currently, although grey parrots are bred in captivity in South Africa, the use of wild sourced parrots as breeding stock for this industry still pose a significant threat to the species, and the captive breeding operations demand additional scrutiny, if their efficacy is to be proven (Martin 2018b, 2018c). Before the uplisting into the CITES Appendix I, Arabian countries were the primary importers of legal grey parrots, followed by Central and Southeast Asia, because import bans in the US and Europe diminished their importance as consumer countries (Martin 2018b; Aloysius et al. 2020).

With the increasing attention being paid to the overexploitation of grey parrots as pets, studies have focused on their local trade (Annorabah et al. 2016) trade in Southeast Asia (Poole and Shepherd 2017), and online markets (Martin et al. 2018a). These studies have identified trade hotspots, i.e. countries or regions where a disproportionate level of trade in grey parrots is recorded and where interventions to curb the trade would be most effective. Less attention has been given to the trade cold spots, i.e. regions where we would expect trade to be recorded, but where it is not. One of those regions is North Africa and in particular Morocco, Algeria and Tunisia. North Africa acts as a gateway to Europe for trade for many products, including wildlife (Nijman et al. 2016; Van Lavieren et al. 2016; Van Uhm 2016), and has significant economic and cultural ties with regions that have been identified as important in the trade in grey parrots. We here focus on the trade in grey parrots in Algeria. Although it is the largest country in Africa, Algeria has received little attention as a source, consumer or transit country for wildlife (however, see Khelifa et al. 2017). In terms of GDP, Algeria ranks fourth in Africa (after Nigeria, South Africa and Egypt) and 54th globally. It has a population of more than 35 million people, which is divided into 30 urban agglomerations of more than 100 000 inhabitants, all located in the northern part of the country (ONS 2018). As a result, it is extremely difficult to control cross-border trade along 1 600 km of coastline and 6 000 km of land borders, and many people and goods cross the border illegally.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2017) is one of the most important treaties regulating international trade in wildlife. With Angola joining CITES in 2013 all range states of the African Grey Parrot are Party to CITES, whereas when Sierra Leone and Ivory Coast joined CITES in 1994, all range countries of the Timneh Parrot were party to CITES. Since 1975, all parrots are listed on Appendix II of CITES, thus regulating their international trade. In 2017, the African Grey Parrot (with the Timneh parrot listed as a subspecies) was uplisted to Appendix I, thereby greatly restricting all international commercial trade.

Algeria acceded to CITES in 1983 and entered the Convention into force in 1984. Algerian constitution stipulates in article 150 that international agreements ratified by

the Republic have priority over laws and are directly implemented, meaning that all imports of species listed under CITES appendix I for commercial use is illegal. The official body for the protection of wildlife in Algeria is La Direction Générale des Forêts (DGF; the General Directorate of Forests), though a recent law (Law No. 14-07 of 13 Chaoual 1435 corresponding to 9 August 2014 relating to biological resources) also establishes a National Body on Biological Resources that have the power to examine all requests for access to biological resources. The law regulating e-commerce activities was adopted in 2017; this law bans all advertisements of any products whose trade in physical markets is prohibited or subject to special conditions (guns, drugs, tobacco alcohol), and by extrapolation, the trade of wild animals listed on Appendix I of CITES. Despite the existence of a wide range of legal instruments, the application of these laws to protect fauna and flora remains problematic and these activities are practiced without any apparent constraints. In this study, we provide an overview of grey parrot trade in Algeria by studying the online and market trade and identify drivers for grey parrot ownership to inform future conservation and policy actions.

## Methods

### Online trade

To assess the online trade of grey parrots in Algeria, we focused on the country's largest classified advertisement website 'ouedkniss.com'. Classified advertisement websites allow users to advertise and sell their goods directly to consumers using an online platform. These websites are divided into categories and potential buyers can browse posts or search by keywords. Each category can have dozens or even hundreds of advertisements listed in a single day, and because users submit posts, often contain little information or misspellings. Using keyword searches can therefore miss important information. Based on this we conducted a comprehensive survey of advertisements posted in the 'general' category, in which the 'animals' subcategory is found. We searched the site from July 2017 to August 2018 and from the 1 January to 31 March 2019. During the first period we checked advertisements daily to ensure that no posts were missed, because they were deleted. Given the very low rate of deletions during this survey period, we checked posts monthly in 2019. We collected information on the origin, price, and age of any parrots found to be for sale online, as well as information about whether they had been taken from the wild or bred in captivity.

### Street markets and pet shop trade

Between 14 August and 12 September 2018, we visited 27 cities across the North of Algeria (where all of the most populous cities in the country are). We met with local contacts, academics, and researchers in many of these cities who helped us to identify street markets with wildlife trade. These cities were chosen based on factors we believed would be likely indicators of wildlife trade i.e. cities with high human populations, large markets, functioning ports, those near to international borders, those with ferry routes to Europe, and those that had been reported in the

literature or by our contacts to contain significant levels of wildlife in trade. In addition to the target cities, we visited other cities as time and accessibility permitted. In most Algerian cities, there are weekly markets on a Friday or Saturday that tend to have a pet section. We surveyed markets comprehensively for all wildlife that was openly displayed. Additional information on price, origin, source (captive-bred or wild), and target customers, were collected opportunistically during informal conversations with vendors. First prices given are often considered negotiable, though we did not enter into a discussion to lower prices, because this could stimulate the trade. Prices were converted in USD according to the change rate given by Banque d'Algérie 2018. No animals were purchased in the course of this study.

### **Sellers' surveys**

To get an insight on the origin of the grey parrots put up for sale online, and the awareness of sellers about any protected statuses of this parrot, we conducted a series of semi-structured phone interviews with 'parrot sellers'. Phone numbers were obtained from the online advertisements, and to ensure anonymity, they were not stored and no names were recorded. Each respondent was informed about the nature of the study and asked whether they consented to be interviewed. Interviews were conducted in Arabic by a native Arabic speaker. Of the 168 parrot owners that we contacted, 80 were unreachable, 21 did not wish to participate in the survey. Some 67 owners consented to participate in the survey and they were asked the following questions:

- How many African grey or Timneh parrots do you have in your possession?
- Do you have other cage birds, if so, what are the species?
- Are the African grey or Timneh parrots you own captive-bred or wild-sourced?

Following these questions, we then asked the respondents whether they were willing to give demographic information about themselves in broad categories. These questions were as follows:

- What is your age? Under 18, 19–30, 31–40, Over 40.
- Why do you keep grey parrots?
- Are you aware of any protected status of this parrot?

## **Results**

### **Online trade**

Over the two survey periods, we found grey parrots regularly advertised online, with an average rate of 0.59 ads per day, we found 561 parrots for sale in 269 advertisements. The majority of advertisers offered to sell a single individual (79.2%,  $n = 213$ ), in 18 of these, sellers offered two individuals, in 20 advertisements sellers offered more than two individuals, and 18 advertisements did not specify how many were offered (if no quantity was specified, we recorded a single parrot for the transaction). We recorded advertisements in 23 of the 48 Algerian provinces (Figure 1). The majority of posts were from Algiers (53.6%), followed by Oran (8%), Blida (6.8%), Tipaza (6%), and Boumerdes (4.4%). Online prices were mentioned in 148 posts, and ranged from US\$228 to

US\$1 054, with an average of US\$472. The monetary volume of the first year of the online survey involving 308 individuals was estimated at a minimum of ~US\$70 000.

### **Market trade**

During the survey period in 2018, we visited 27 Algerian cities. In these cities, weekly markets often take place on Fridays or Saturdays, of which we visited 13. For these markets, pet shop owners sometimes bring their animals for sale, whereas others only sell animals at weekly markets and keep their animals in warehouses during the week. We observed grey parrots in three of these weekly markets: 28 in Algiers, one in Constantine (El Khroub) and one in Oran. We found that the pet shops regularly contained a small number of grey parrots, with a maximum of four individuals found in a single pet shop in Algiers. We visited a total of 81 pet shops and observed 44 grey parrots in 28 stores in 15 cities, with the largest number observed in Algiers (see Table 1). Prices (both in markets and in stores) for grey parrots ranged from US\$219 to US\$674, with an average of US\$233.

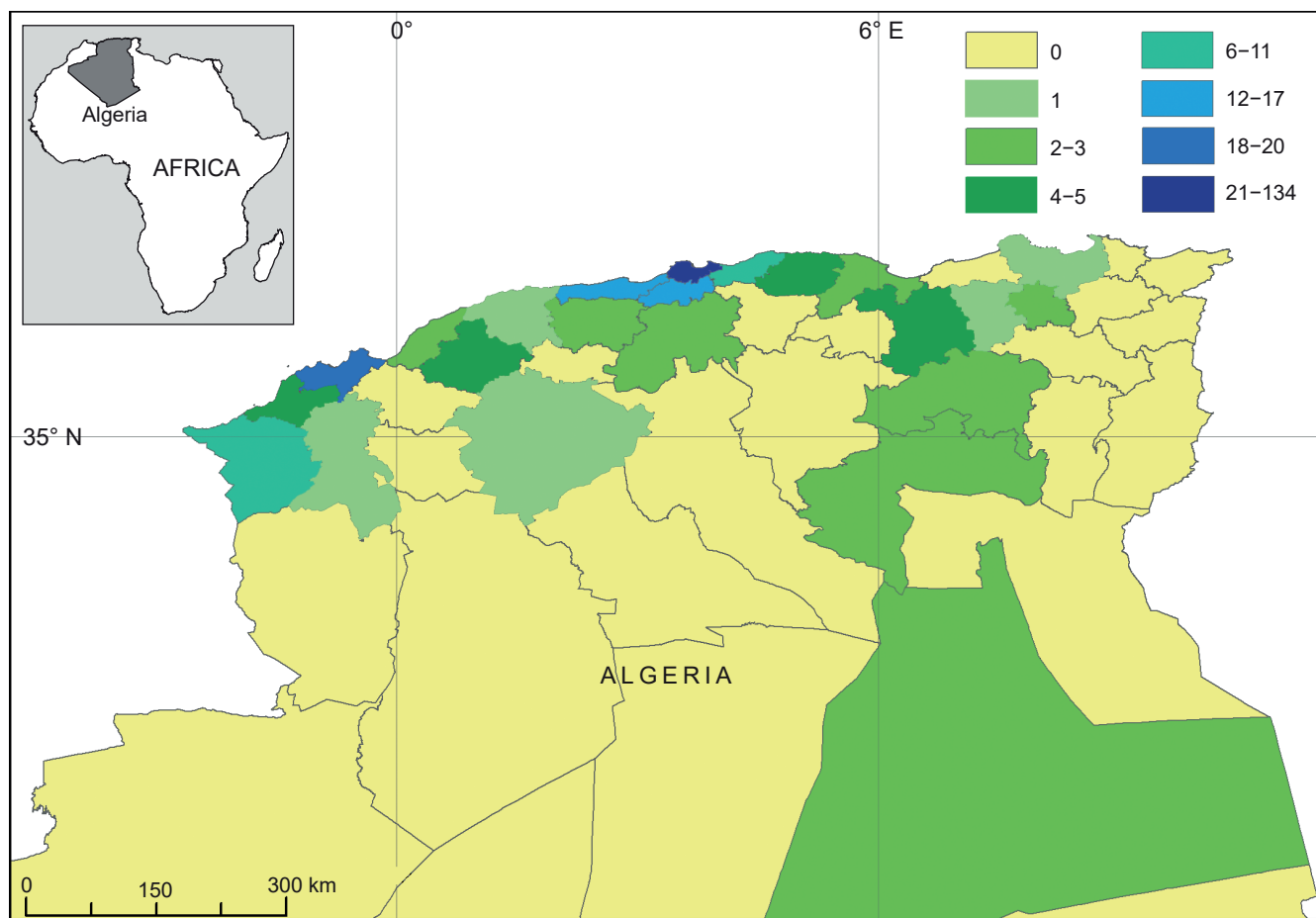
### **Sellers' surveys**

Of the total respondents, 58.2% of the sellers reported owning only one grey parrot, 14.9% reported owning two grey parrots and 26.9% owned more than two. The majority of sellers (64.0%) also reported owning other species of birds. The bird species other than grey parrots most often owned were: the European Goldfinch *Carduelis carduelis*, the canary *Serinus canaria domestica* and the Senegal Parrot *Poicephalus senegalus*. The main reason given for owning grey parrots is their sociability and speaking ability, according to 66% of respondents, 9% of respondents said that the main reason they own grey parrots is to trade in them, and 25% of respondents said that sociability/speaking ability and the possibility of making a profit on resale are factors that contribute to parrot ownership. The majority of the birds (84%) were reportedly caught in the wild; only 1% was bred in captivity and 15% was of unknown origin.

All respondents were male, and of those who gave their age ( $n = 60$ ), 6% were <18 years of age, 19% were between 19 and 30 years of age, 64% were between 31 and 40 years of age, and 11% were >40 years of age. Only half of the participants knew that selling grey parrots was illegal in Algeria.

## **Discussion**

In the online wildlife trade, many animals are sold on social media, but some, including the grey parrots, are also sold on classified advertisement websites (IFAW 2014, 2019; Bergin et al. 2018). Global studies on the sale of grey parrots on social media may therefore miss important information. From 1984 to 2017 (the last year for which comprehensive data are available on the CITES trade database), Algeria is recorded as having imported 107 grey parrots: 77 of these were personal pets, two were reported as traded for biomedical research, and two were captive-bred birds. No grey parrots have been imported into Algeria for commercial sales since 1997. The majority of grey parrots entering Algeria have been reported to



**Figure 1:** Geographical location of African Grey Parrots advertisements posted on the investigated classified advertisement website

CITES by exporting countries, indicating that the Algerian side has failed to fulfil its obligations under CITES. Also, an inter-ministerial note dating from 2004 prohibits the import of exotic birds from countries where avian influenza has been declared, but no list of such countries has been published by authorities and in practice, all imports of exotic birds into Algeria have been prohibited since that date. During this study, more than 635 grey parrots were offered for sale online, in street markets and in pet shops, which implies that almost all the grey parrots put up for sale during this period were illegally imported.

With only 19.7% internet penetration rate estimated in 2016 (Internetlivestats 2018), the popularity of e-commerce platforms in Algeria is low, but increasingly people are buying goods online, especially in major cities and 'ouedkniss' e-commerce website is the third most popular website in Algeria (www.Alexa.com). Most advertisements were from the capital, Algiers, and the surrounding provinces Tipaza, Blida and Boumerdes, comprising more than 70% of all advertisements. This may be attributable to a higher Internet penetration rate in Algiers than in the rest of the country, the higher population, higher income, provincial preferences/consumption habits, or a mix of reasons. For additional research, it should be noted that practically all advertisements were written in French, included photos

and animals are advertised by their common name, the most frequent names used to describe Grey Parrots are 'Perroquet; Perroquet gris; Perroquets gris du Gabon; Perroquet Jaco; Jaco; Gabonais and عاغب , يواباق.

In many of these weekly markets in Algeria, a section is reserved for the sale of living animals, and birds are the most traded taxon: the most frequent species were European Goldfinch *Carduelis carduelis*, European Serin *Serinus serinus*, Common Linnet *Linaria cannabina* and Senegal Parrot *Poicephalus senegalus*, which corroborate results obtained by Razkallah et al in 2019. As this was a 'snapshot' of the trade, we were unable to estimate the turnover of grey parrots in the markets.

The grey parrots have been reported as illegally shipped on commercial flights using fraudulent CITES permits (Martin et al 2019). Algeria has no direct flight connections with any countries that are range-states of grey parrots, except for Ivory Coast, and to our knowledge, no seizure report of these species at Algerian airports has been recorded. Two reports sent to CITES secretariat indicate the seizure of five grey parrots coming from Algeria (one in France in 2000, and four in Spain in 2004). Some articles on the seizure of wildlife species published in the national press confirm that the main route of entry for these animals is overland, via countries identified as transit countries,



**Table 1:** Street markets, pet shops visited and grey parrots observed

City	Street market visited	Number of <i>Psittacus</i> parrots on sale in street market	Number of pet shops visited	Number of pet shops offering <i>Psittacus</i> parrots and number of individuals on sale
Annaba	1	0	4	1 (1)
Guelma	0	0	4	2 (5)
Guelma (Bouchehouf)	0	0	1	0
Oum El Bouaghi	0	0	1	0
Constantine	1	0	2	1 (1)
Constantine (El Khroub)	1	1	0	0
Constantine (Ali Mendjeli)	0	0	1	1 (1)
Souk Ahras	0	0	4	1 (3)
Souk Ahras (Sedrata)	0	0	1	1 (1)
Tebessa	0	0	3	0
OuedSouf	1	0	2	1 (1)
Ourgla (Tougourt)	0	0	1	0
Ghardaia	0	0	2	0
Laghouat	0	0	5	1 (1)
El Bayadh	0	0	1	0
SidiBel Abbes	1	0	4	0
Tlemcen	1	0	0	0
Tlemcen (Maghnia)	1	0	3	1 (1)
Mascara	0	0	2	0
Mostaganem	0	0	3	0
Mostaganem (Mazagran)	0	0	1	1 (2)
Oran	1	1	2	0
Algiers	1	28	24	12 (17)
Blida	1	0	2	2 (3)
Boumerdes	0	0	2	1 (2)
Boumerdes (Boudouaou)	1	0	4	0
Setif	1	0	2	2 (5)

such as Mali, Libya, and Tunisia (Martin et al. 2018; Razkallah et al. 2019).

Lower prices for grey parrots correspond to juveniles and start from US\$219 in street markets and US\$227 online. Our results confirm the prices reported by Martin et al (2018a), where African Grey Parrots were sold in importer countries for a mean price of US\$203. The mean price of grey parrots is higher online than in street markets and pet shops, which may be because of the presence of more adult individuals trained to mimic human speech, making them more valuable. The lowest price recorded for grey parrots is 1.5 times higher than the minimum monthly guaranteed salary in Algeria (Bank of Algeria 2018).

To reduce motivation for the consumption of illegal wildlife products, consumers and their behaviour must be identified (Bennet et al. 2017; Moorhouse et al. 2017). Our unpublished results on the use of wild animals in traditional medicine indicate that unlike several African countries, grey parrots' body parts are not used in Algeria as traditional medicine, but only appreciated as pet birds because of their sociability and their ability to reproduce human speech.

During our visits to street markets, a large bias in the number of male consumers, compared with females was observed, with some markets having no females at all in the sections reserved for the sale of animals. Interviews of the online grey parrot sellers also indicate that advertisers are mostly males aged between 31 and

40 years. Razkallah et al (2019) reported two categories of sellers present in street markets: professional sellers tend to offer juvenile individuals in higher numbers and hobbyists who often sell, resell, and exchange one or two birds, for a variety of reasons, such as to earn a profit or to get a better specimen. By extrapolating observations on the functioning of street markets to the online trade, 26.86% of the advertisements offer more than two individuals, indicating that probably the majority of sellers are hobbyists who sell their pet bird.

Vendors are unafraid of enforcement, and wildlife products are openly sold online and in physical markets, which indicate that no constraints are exerted by authorities. Nearly 50% of vendors are not aware that the species is threatened and that this trade is illegal, indicating a lack of information about the conservation status of animals, and about the illegality of this trade.

## Conclusions and recommendations

The increase in internet accessibility offers anonymity to sellers and buyers of animals. This situation allows customers to bypass the intermediary, resulting in the rapid growth of e-commerce platforms. At the same time, the trade of legal and illegal wildlife specimens and products is increasing (IFAW 2014; Annorbah 2016; Martin 2018a; Sung 2018), which results in new challenges for conservationists.

Concrete actions implicating government agencies, conservation NGOs and the scientific community, must be undertaken to develop and implement policies to tackle wildlife trafficking. A first step would be to invite tech companies to reduce illegal wildlife trade via their platforms, by adding this prohibition to their terms of use and also by applying filters that detect and delete fraudulent advertisements; which is not the case today. A second step would require awareness-raising campaigns, and to be effective, future research must identify message structure to which owners would be most receptive, as well as effective communication channels (radio, television, written press, and social media) likely to reach the greatest number of cage bird keepers.

**Ethics statement** — The scientific committee of the department of ecology at the *Université 8 Mai 1945* reviewed and approved all methods and procedures used in this research.

**Acknowledgements** — This study was supported by the Cleveland Zoo and Metroparks and the Algerian Directorate General for Scientific and Technological Development. We thank the associate editor Dr Alan Lee and anonymous reviewers for their comments that improved earlier versions of the manuscript.

## ORCID

Sadek Atoussi: <http://orcid.org/0000-0001-8303-6313>

## References

- Alexa. 2018. [https://www.alexa.com/topsites/countries/DZ\\_09/03/2018/](https://www.alexa.com/topsites/countries/DZ_09/03/2018/) [Accessed 9 March 2018].
- Aloysius SLM, Yong DL, Lee JG, Jain A. 2020. Flying into extinction: Understanding the role of Singapore's international parrot trade in growing domestic demand. *Bird Conservation International* 30: 139–155. <https://doi.org/10.1017/S0959270919000182>.
- Alves RRN, Santana GG, Rosa IL. 2013. The role of animal-derived remedies as complementary medicine in Brazil. In *Animals in traditional folk medicine* (pp 289–301). Berlin: Springer. <https://doi.org/10.1007/978-3-642-29026-8>.
- Annorbah NN, Collar NJ, Marsden, SJ. 2016. Trade and habitat change virtually eliminate the grey parrot *Psittacus erithacus* from Ghana. *Ibis* 158: 82–91. <https://doi.org/10.1111/ibi.12332>.
- Atuo FA, O'Connell TJ, Abanyam PU. 2015. An assessment of socio-economic drivers of avian body parts trade in West African rainforests. *Biological Conservation* 191: 614–622. <https://doi.org/10.1016/j.biocon.2015.08.013>.
- Bennett NJ, Roth R, Klain SC, Chan K, Christie P, Clark DA, Cullman G, Curran D, Durbin TJ, Epstein G, Greenberg A, Nelson MP, Sandlos J, Stedman R, Teel TL, Thomas R, Verissimo D, Wyborn C. 2017. Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation* 205: 93–108. <https://doi.org/10.1016/j.biocon.2016.10.006>.
- Bank of Algeria. 2018. <https://www.bank-of-algeria.dz/html/marcheint2.html> [Accessed 16 December 2018].
- Bergin D, Atoussi S, Waters S. 2018. Online trade of Barbary Macaques *Macaca sylvanus* in Algeria and Morocco. *Biodiversity and Conservation* 27: 531–534. <https://doi.org/10.1007/s10531-017-1434-5>.
- BirdLife International. 2017. *Psittacus erithacus* (amended version of 2016 assessment). The IUCN Red List of Threatened Species 2017. <http://dx.doi.org/10.2305/IUCN.UK.20171.RLTS.T22724813A111471911.en> [Accessed 10 January 2019].
- BirdLife International. 2018. *Psittacus timneh*. The IUCN Red List of Threatened Species 2018. <http://dx.doi.org/10.2305/IUCN.UK.20182.RLTS.T22736498A129878408.en> [Accessed 10 January 2019].
- BirdLife International. 2018. *Psittacus erithacus*. The IUCN Red List of Threatened Species 2018. <http://dx.doi.org/10.2305/IUCN.UK.20182.RLTS.T22724813A129879439.en> [Accessed 10 January 2019].
- Bush ER, Baker SE, Macdonald DW. 2014. Global trade in exotic pets 2006–2012. *Conservation Biology* 28: 663–676. <https://doi.org/10.1111/cobi.12240>.
- Can OE, D'Cruze N, Macdonald DW. 2019. Dealing in deadly pathogens: Taking stock of the legal trade in live wildlife and potential risks to human health. *Global Ecology and Conservation* 17: e00515. <https://doi.org/10.1016/j.gecco.2018.e00515>.
- Chng SCL, Eaton JA, Krishnasamy K, Shephard CR, Nijman V. 2015. In the market for extinction: an inventory of Jakarta's bird markets. Traffic. Available at: [https://www.traffic.org/site/assets/files/2466/market\\_for\\_extinction\\_jakarta.pdf](https://www.traffic.org/site/assets/files/2466/market_for_extinction_jakarta.pdf).
- Chng SC, Eaton, JA. 2016. Snapshot of an on-going trade: an inventory of birds for sale in Chatuchak weekend market, Bangkok, Thailand. *BirdingAsia* 25: 24–29.
- CITES. 2017. Convention on International Trade in Endangered Species of Wild Fauna and Flora Appendices I, II and III. 2017. <https://www.cites.org/eng/app/appendices.php>. [Accessed 16 December 2018].
- CITES. 2017. Trade database. [https://trade.cites.org/en/cites\\_trade/](https://trade.cites.org/en/cites_trade/). [Accessed 1 November 2018].
- Del Hoyo J, Collar NJ, Christie DA, Elliott A, Fishpool LDC. 2014. *HBW and BirdLife International Illustrated Checklist of the Birds of the World: non-passerines* (Vol 1). Barcelona: Lynx Edicions.
- Eid E, Al Hasani I, Al Share T, Abed O, Amr Z. 2011. Animal Trade in Amman Local Market, Jordan. *Jordan Journal of Biological Sciences* 4: 101–108.
- Fa JE, Seymour S, Dupain JEF, Amin R, Albrechtsen L, Macdonald D. 2006. Getting to grips with the magnitude of exploitation: bushmeat in the Cross–Sanaga rivers region, Nigeria and Cameroon. *Biological Conservation* 129: 497–510. <https://doi.org/10.1016/j.biocon.2005.11.031>.
- Frynta D, Lišková S, Bültmann S, Burda H. 2010. Being attractive brings advantages: the case of parrot species in captivity. *PLoS ONE* 5: e12568. <https://doi.org/10.1371/journal.pone.0012568>.
- IFAW (International Fund for Animal Welfare). 2014. Wanted—dead or alive: exposing online wildlife trade. London: International Fund for Animal Welfare.
- IFAW (International Fund for Animal Welfare). 2019. Wanted—dead or alive: exposing online wildlife trade. London: International Fund for Animal Welfare.
- Internet live stats. 2018. <http://www.internetlivestats.com/internet-users-by-country/>. [Accessed 27 December 2018].
- IUCN. 2018. The IUCN Red List of Threatened Species. <http://www.iucnredlist.org/>. [Accessed 15 December 2018].
- Khelifa R, Zebba R, Amari H, Mellal MK, Bensouilah S, Laouar A, Mahdjoub H. 2017. Unravelling the drastic range retraction of an emblematic songbird of North Africa: potential threats to Afro-Palearctic migratory birds. *Scientific Reports* 7: 1–11. <https://doi.org/10.1038/s41598-017-01103-w>.
- Martin RO, Senni C, D'Cruze NC. 2018a. Trade in wild-sourced African grey parrots: Insights via social media. *Global Ecology and Conservation* 15: e00429. <https://doi.org/10.1016/j.gecco.2018.e00429>.
- Martin RO. 2018b. Grey areas: temporal and geographical dynamics of international trade of Grey and Timneh Parrots (*Psittacus erithacus* and *P. timneh*) under CITES. *Emu-Austral Ornithology* 118: 113–125. <https://doi.org/10.1080/01584197.2017.1369854>.
- Martin RO. 2018c. The wild bird trade and African parrots: past, present and future challenges. *Ostrich* 89: 139–143. <https://doi.org/10.2989/00306525.2017.1397787>.

- Martin RO, Senni C, D'Cruze N, Bruschi N. 2019. Tricks of the trade—legal trade used to conceal Endangered African Grey Parrots on commercial flights. *Oryx* 53: 213. <https://doi.org/10.1017/S0030605319000097>.
- Moorhouse TP, Balaskas M, D'Cruze NC, Macdonald DW. 2017. Information could reduce consumer demand for exotic pets. *Conservation Letters* 10: 337–345. <https://doi.org/10.1111/conl.12270>.
- Mundy-Taylor V. 2013. Illegal Wildlife Trade and the European Union: An analysis of EU-TWIX seizure data for the period 2007–2011. *Report prepared for the European Commission*. <https://www.traffic.org/site/assets/files/3792/eu-twix-seizures-2007-2011.pdf> [Accessed 15 August 2018].
- Nijman V, Bergin D, Van Lavieren E. 2015. Conservation in an ever-globalizing World: wildlife trade in, from, and through Morocco, a gateway to Europe (pp 313–323). *Tropical Conservation: A View from the South on Local and Global Priorities*. Oxford: Oxford University Press.
- ONS. 2018. Office National des Statistiques. <http://www.ons.dz/-Masse-Salariale-.html/> [Accessed 27 December 2018].
- Olah G, Butchart SHM, Symes A, Guzmán IM, Cunningham R, Brightsmith DJ, Heinsohn R. 2016. Ecological and socio-economic factors affecting extinction risk in parrots. *Biodiversity and Conservation* 25: 205–223. <https://doi.org/10.1007/s10531-015-1036-z>.
- Pires SF. 2012. The illegal parrot trade: a literature review. *Global Crime* 13: 176–190. <https://doi.org/10.1080/17440572.2012.700180>.
- Poole CM, Shepherd CR. 2017. Shades of grey: the legal trade in CITES-listed birds in Singapore, notably the globally threatened African Grey Parrot *Psittacus erithacus*. *Oryx* 51: 411–417. <https://doi.org/10.1017/S0030605314000234>.
- Razkallah I, Atoussi S, Telailia S, Abdelghani M, Zihad B, Moussa H. 2019. Illegal wild birds' trade in a street market in the region of Guelma, north-east of Algeria. *Avian Biology Research* 12: 96–102. <https://doi.org/10.1177/1758155919826773>.
- Reino L, Figueira R, Beja P, Araújo MB, Capinha C, Strubbe D. 2017. Networks of global bird invasion altered by regional trade ban. *Science Advances* 3: e1700783. <https://doi.org/10.1126/sciadv.1700783>.
- Sodeinde OA, Soewu DA. 1999. Pilot study of the traditional medicine trade in Nigeria. *TRAFFIC Bulletin* 18: 35–40.
- Sung YH, Fong JJ. 2018. Assessing consumer trends and illegal activity by monitoring the online wildlife trade. *Biological Conservation* 227: 219–225. <https://doi.org/10.1016/j.biocon.2018.09.025>.
- Tella JL, Hiraldo F. 2014. Illegal and legal parrot trade shows a long-term, cross-cultural preference for the most attractive species increasing their risk of extinction. *PLoS ONE* 9: e107546. <https://doi.org/10.1371/journal.pone.0107546>.
- TRAFFIC. 2015. <http://www.traffic.org/trade/>. [Accessed 16 December 2018].
- Van Lavieren E, Bergin D, Nijman V. 2016. Case Study 11 The Trade in Barbary Macaques and the Link to the Moroccan Diaspora in Europe. *Tropical Conservation: Perspectives on Local and Global Priorities*. New York: Oxford University Press. p. 324.
- Van Uhm DP. 2016. Monkey business: the illegal trade in Barbary macaques. *Journal of Trafficking, Organized Crime and Security* 2: 36–49.