



Wildlife Trafficking between the European Union and Mexico

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Abstract

Illegal wildlife trade or wildlife trafficking is a global threat to all kinds of species, not just charismatic megafauna or wildlife in Africa and Asia. This paper presents the findings of an investigation of the illegal trade in native and non-native wildlife and wildlife products between the European Union and Mexico. Using literature analysis, secondary trade data and expert interviews, this study explores the nature and extent of wildlife trafficking between these two regions, including the involvement of organised crime within an eco-global criminological framework. This is important for the regions studied and for the global community more generally, as wildlife trafficking is contributing not only to species extinction, but also to instability, violence and unhealthy physical environments for humans.

Keywords

Green criminology; illegal wildlife trade; Mexico; organised crime; wildlife trafficking.

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Introduction

Illegal wildlife trade or wildlife trafficking is not confined to charismatic megafauna or Africa and Asia. It is a global threat to wildlife with supply and/or demand stemming from and potentially affecting all regions. Wildlife trafficking involves many distinct markets, each with their own drivers and dynamics (Wyatt 2013; UNODC 2016a). The United Nations Office on Drugs and Crime (UNODC) (2016a) has identified suspected traffickers from 80 different countries, as well as trafficking flows from over 100 countries. This illustrates that wildlife trafficking is truly a global issue. Most regions of the world play a role as a source, transit or destination for contraband wildlife, although certain types of wildlife are strongly associated with each region and certain countries are more likely to serve as sources of or destinations for the illegal trade. For example, birds are most strongly associated with Latin America (Sollund 2017; Reuter et al. 2018), mammals with Africa and Asia (Burgess et al. 2014; Harrison et al. 2015; Heinrich et al. 2016; UNODC 2016a; Nguyen and Frechette 2017), reptiles with Europe and North America (Auliya et al. 2016; UNODC 2016a), and corals with Oceania (UNODC 2016a). The issue also now features on the global security agenda, as illegal trade in wildlife is, in some cases, thought to be associated with organised crime syndicates, arms trafficking and, to a much lesser degree, armed militant groups (Vira and Ewing 2014; Carlson et al. 2015).

While much attention is currently paid to China's role as the largest consumer of wildlife and wildlife parts (Felbab-Brown 2017), particularly ivory and body parts used in traditional medicines, this ignores the significant and crucial role of other regions in the global consumption of fauna and flora from around the world (see Herbig 2010; UNODC 2016a among others). McMurray (2008), for instance, has noted that the European Union (EU) is one of the areas with the highest demand for wildlife and wildlife products. The EU is source, processing point and/or destination of some of the most trafficked wildlife in the world (Auliya et al. 2016; Respondent 24, personal communication 2016; UNODC 2016a; van Uhm 2016b; Maher and Sollund 2017).

The EU is worth further study because of the complexity of tracking imports and exports through this economic community, and because of its approach to voting on proposals at the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) Conference of the Parties meetings. In terms of CITES, each of the 28 EU member countries is an individual party to CITES; the region as a whole was not a single voting member until 2015. This means that each country has varying levels of implementation of and compliance with CITES legislation.¹ For example, some territories of the United Kingdom (UK), like Guernsey (an island in the English Channel off the coast of Normandy), are Category 3, which indicates that the legislation is generally believed not to meet any of the four requirements for the implementation of CITES legislation (CITES 2018). Presumably, this leaves the possibility for countries and areas within countries with less stringent oversight to be used as a route to traffic wildlife into the EU as a whole. In regard to the EU's approach to voting on motions at CITES conventions, even prior to joining CITES as a single entity in 2015, member countries agree to vote as a block of countries (Dale-Harris 2013). This has meant, for instance, that a motion for a global ban on trade in polar bear products was unsuccessful due in part to the EU voting against it to support the opposition of Greenland (a territory of Denmark), which opposed the ban (Dale-Harris 2013). Thus, it is incumbent on green criminologists to research the EU as both a key region for demand and consumption of wildlife, as well as a potentially powerful entity influencing wildlife trade and regulation.

Mexico, a mega diverse country in terms of its ecosystems and level of endemic flora and fauna (CONABIO 2008), is also a source of wildlife for trade and trafficking, as would be expected with such diversity. Yet Mexico, and Latin America in general, receives limited attention in terms of wildlife trade and trafficking (UNODC 2016b; Arroyo-Quiroz and Wyatt forthcoming 2019). The study of international wildlife trade and trafficking involving Mexico has been hampered by several factors, such as limited funding, the low priority accorded to such studies by the Mexican

government, lack of interest among specialists, the unsafe environment for fieldwork and debate around whether non-human animals are a natural resource or whether they are individuals with rights (Arroyo-Quiroz 2010; Arroyo-Quiroz and Wyatt forthcoming 2019). Mexico's major role in wildlife trade is as an *entrepot* nation. In this study, we discovered that there are substantial levels of import and re-export of non-native species (mainly of reptile skins for the leather industry), and some smuggling of non-native species. In the past, there have also been high levels of trade in native species, much of it illegal and mainly comprising reptile skins, birds and plants (Arroyo-Quiroz 2010; Arroyo-Quiroz and Wyatt forthcoming 2019).

Although some comprehensive studies of trade in native species have been undertaken in Mexico, most studies concerning wildlife trade in and from Mexico have arisen from research about wildlife trade between the United States (US) and Mexico (Arroyo-Quiroz and Wyatt forthcoming 2019). Indeed, most wildlife re-exports from Mexico are imported by the US and the trade route from Mexico to the US has involved and continues to include a variety of native species, particularly reptiles (for their skins and products made from reptile leather), psittacines (macaws, parrots) and cacti (Arroyo-Quiroz 2010; Reuter and O'Regan 2017; Arroyo-Quiroz and Wyatt forthcoming 2019). However, a clearer picture of the current nature and scope of trade and trafficking in Mexico is needed, which should also consider the links between Mexico and other countries involved significantly in wildlife trafficking (Arroyo-Quiroz 2010; Reuter et al. 2018). There is evidence, for instance, of illegal wildlife trade between Mexico and some European countries (see Anton et al. 2002; PROFEPA 2008; Altherr 2014; La Jornada 2014; Auliya et al. 2016; El País 2016). As will be demonstrated later in this paper through exploration of the import and export of wildlife between the EU and Mexico, the range of wildlife species involved is extensive. There is demand for ivory and traditional medicines, as in China, but there is also evidence of buying exotic (companion) animals, decorative rare plants and skins used in luxury fashion items.

In addition, in the Mexican context, attention should be paid to the level of involvement, if any, of organised crime, as this is a general concern throughout Mexico (Alvarado Martínez 2014; Medel and Thoumi 2014; Respondent 1 personal communication, 2016; Martínez and Martínez 2018).

The main objective of this article is to answer the question, 'what is the nature and extent of illegal wildlife trade between Mexico and the EU?'. This includes an investigation of which species are trafficked, how many are trafficked, for what purpose they are trafficked and if there is evidence of organised crime involvement. This will be undertaken within an eco-global criminological framework, which will be discussed next, along with a conceptualisation of organised crime. This paper will then describe the methods employed for the research, followed by the findings and analysis. We conclude by discussing the local, regional and global consequences of eco-global green crimes.

Eco-global criminology

As Elliott (2007) and White (2011) proposed, much green crime is transnational in nature. This is true of wildlife trafficking, which can also be domestic in scope. The transnationality of the illegal wildlife trade is not always a simple chain of events, in which wildlife is taken from one country and transported directly to another country for consumption (Wyatt 2013; van Uhm 2016b). We argue that illegal wildlife trade sits within an eco-global criminological theoretical framework. This is the case for three reasons, for which we will provide evidence in the findings section. First, eco-global criminology is an eco-centric based approach that argues that the planet's systems, including its ecosystems, are interconnected (White 2011). Relatedly, the planet is also interconnected through the perpetration of green crimes and frequently, the impacts of these green crimes are not just local, but global. Further, perpetration may well be by organised crime (which we define shortly), which can have eco-global criminological implications, as we discuss in the next section. Second, eco-global criminology is a critical criminology with a harm-

based approach, which means activities that are legal but harmful (like mining using arsenic) fall under examination. Third, while certain illegal wildlife markets between the EU and Mexico are intertwined, there are still local and regional differences, even though there are clear geographic patterns that White (2011) proposed would exist under his eco-global criminological framework.

Organised crime

The trafficking of wildlife is increasingly recognised as both a specialised area of organised crime and a significant threat to many plant and animal species (UNODC 2016a; van Uhm 2016b; Cooney et al. 2018). In the context of illegal wildlife trade involving Mexico, it is necessary to address issues around organised crime within a globalised trade and economic system. This is because organised crime is documented as affecting Mexican society on a variety of levels and dimensions (Bunker and Sullivan 2010; Medel and Thoumi 2014; Toledo 2015). Presumably, this may be the case with wildlife trafficking in the Mexican context as well (UNODC 2016b), which we will discuss further in the findings section of this paper.

There is no single definition of organised crime (see Paoli 2001; Paoli and Van der Beken 2014 among others) and it is beyond the scope of this article to explore the different definitions of organised crime. For the purposes of this paper, we adopt a conceptualisation of organised crime that combines the elements of high organisation and discipline in supplying illegal goods and services (Passas 1995) with longevity, continuity and rationality (Hagan 1983), which are all supported by violence (Arlacchi 1998). This differs from the definition agreed to in the United Nations Convention Against Transnational Organized Crime (UNTOC) and its accompanying protocols,² which does not include violence (UNODC 2004). UNTOC's definition of organised crime fits more of Reuter's (1986) definition of *disorganised* crime in that it is structured, yet lacks the element of violence as a tool. UNTOC requires the crime committed to be 'serious', which is defined as a crime that is punishable by imprisonment of more than four years. Clearly, seriousness under UNTOC will vary between states and what the states have prioritised; this means that wildlife trafficking may often not be viewed as an organised crime using the UNTOC definition. Our utilisation of a different definition of organised crime allows for investigation of *serious* perpetrators, rather than the oversimplification of the UNTOC definition, which labels nearly any group of criminals as organised crime. Such an approach enables the complexity of wildlife trafficking perpetration as sometimes by organised crime and other times not visible. This is crucial when developing prevention and disruption strategies.

Brack (2003) suggested that syndicated or serious organised crime has increased with globalisation and is linked to the collapse of borders. In parts of the world undergoing industrialisation, transnational organised crime has grown because these organisations provide employment for people in areas where there are limited economic opportunities, high unemployment and limited capital (Shelley 2005). This is evident in Mexico as well, where organised crime, particularly cartels trafficking drugs, has become more powerful and global in scope (Bunker and Sullivan 2010; Medel and Thoumi 2014; Toledo 2015). Albanese's (2000: 415) research on why organised crime exists in the first place corresponds with such societal elements as fewer borders and better communication. He proposed that organised crime thrives under five opportunity factors: 1) economic conditions; 2) government regulation; 3) enforcement effectiveness; 4) demand for a product/service; and 5) creation of new product/service market via technological or social change. The factors do not mean that, for instance, the economic conditions are 'poor' or 'good', but that organised crime has the opportunity to function in that market due to conditions within the five categories proposed. Whether these opportunity factors are present and applicable to wildlife trafficking in the EU and Mexico is part of the focus of the analysis below. First, however, the methodology used for this research is presented.

Methods

This research used a mixed-methods approach involving an analysis of existing literature, trade data collection and semi-structured interviews with experts from the private sector, non-government organisations and governments in the EU and Mexico on wildlife use, conservation and trafficking. The academic and grey literature were analysed for information regarding the nature and extent of the connection between the EU and Mexico, as well as data relating to the involvement of organised crime between these two regions. Through a purposive sample, we interviewed 24 experts about the nature and extent of wildlife trafficking and involvement of organised crime (see Table 1).

In addition, this study collected trade data from three sources. First, we examined the CITES online database that is managed by the World Conservation Monitoring Centre. This database included *all* trade between Mexico and the countries of the EU between 1980 and 2017 (which is all the data available involving Mexico and EU countries). However, for this article, we focused on what had been reported as 'I'—confiscated or seized wildlife specimens—to the CITES Secretariat for Mexican exports to the EU and EU exports to Mexico (195 entries). It is important to note that the nature of this data source affects the scope of this analysis because CITES establishes the rules for trade in over 35,000 protected species. Thus, trafficking of non-CITES listed species are not found in this database (UNODC 2016a). Further, not all confiscations, seizures or incidents of wildlife trafficking are reported to the CITES Secretariat (Wyatt 2013). Second, we used seizure data from attempted exports at Mexican airports obtained from PROFEPA (*Procuraduría Federal de Protección al Ambiente*—Federal Attorney for Environmental Protection), which is the branch of the Mexican government that oversees wildlife trade at borders, ports and airports (19 entries). Third, permission was obtained from 26 of the 28 EU member countries to access the Trade in Wildlife Information Exchange database (EU TWIX), a comprehensive restricted online tool for information sharing about wildlife trafficking for law enforcement (103 entries). As Maher and Sollund (2017: 101) explained:

The EU-TWIX database has been developed to assist national law enforcement agencies, including CITES Management Authorities and prosecutors, in their task of detecting, analysing and monitoring illegal activities related to trade in fauna and flora covered by the EU Wildlife Trade Regulations.

The comprehensiveness and usefulness of this source of information largely depends on the regular input of information relating to new seizures and offences by each national law enforcement agency. As such, the contribution of all designated enforcement officers in each EU Member State is essential to the usefulness of this tool (EU TWIX 2006). The EU TWIX seizure data related to the EU and Mexico are some of the same incidents recorded in the CITES online trade base, but the EU TWIX database provides more detailed information as to the location of the seizure, nationality of the perpetrator and status of the criminal case, if one was initiated. As with the CITES trade data, EU TWIX data has an unknown figure of dark crime since it is reliant on member countries reporting the confiscations, seizures and incidents of trafficking as well as not capturing the unrecorded and unknown amount of trafficking (Wyatt 2013; van Uhm 2016a).

Tables 2 and 3 (Appendix A) contain the combined data from the three sources on the number of illegal items seized between 1980 and 2017 (317 entries). Duplicate data from the three sources were removed if we were certain it was the same entry; thus, there may be a small degree of over-counting. The repetitive entries ($n = 38$) were eliminated, leaving 279 entries both for wild animal and plant species. Then, we categorised the trade data into five markets following the UNODC's (2016a) *World Wildlife Crime Report*: 1) non-timber products; 2) art décor, jewellery and trophies; 3) fashion; 4) live animals, pets, zoo and breeding; and 5) tonics and medicines. It should be noted that comparing and aggregating data on illegal wildlife is complicated because of the variety of products involved and the measurements utilised. For example, seizures range from

container shipments of multiple items recorded in kilograms to trinkets in the hand luggage of individual travellers recorded as units. In addition, seizure data require careful interpretation because they can indicate either the presence of a problem or the initiative of the relevant authorities in addressing it or both. Further, seizures on their own are of limited use in researching wildlife trafficking, as they cannot be used to determine the magnitude of trafficking or the capacity or efficiency of law enforcement (Rosen and Smith 2010; UNODC 2016a).

Table 1: Interviews in Mexico, Europe, and relevant regions

<i>Sector</i>	<i>Organisation</i>	<i>Respondent Code</i>
Academic institution	Instituto Nacional de Ciencias Penales (INACIPE), Mexico City	1
Intergovernmental organisation	Oficina de Enlace y Partenariado México (LPO), United Nations Office on Drugs and Crime (UNODC), Mexico City	2
	Development and Management Unit, Studies and Threat Analysis Section, Division for Policy Analysis and Public Affairs, United Nations Office on Drugs and Crime (UNODC), Vienna International Centre, Austria	3
	Transnational Organized Crime, Studies and Threat Analysis Section, Division for Policy Analysis and Public Affairs, United Nations Office on Drugs and Crime (UNODC), Vienna International Centre, Austria	4
	Trade and Environment Programme, International Trade Center (ITC) (subsidiary of WTO and UNCTAD), Geneva, Switzerland	5
Non-governmental organisations	TRAFFIC Mexico Programme, Mexico City	6
	TRAFFIC International – The Wildlife Trade Monitoring Network, UK	7
	TEYELIZ A.C., Mexico City	8
	Responsible Ecosystems Sourcing Platform (RESP), Geneva, Switzerland	9
	WWF International, Gland, Switzerland	10
	TRAFFIC Southeast Asia	11
	Global Trees Specialist Group, IUCN	12
	Orchid Specialist Group, IUCN	13
Governmental agency	Dirección General de Inspección y Vigilancia de Vida Silvestre, Recursos Marinos y Ecosistemas Costeros, Subprocuraduría de Recursos Naturales, PROFEPA, Mexico City	14
	CITES Law Enforcement, Dirección de Inspección y Vigilancia de Vida Silvestre y Fitosanitaria en Puertos, Aeropuertos y Fronteras, PROFEPA, Mexico City	15
	CITES Scientific Authority Mexico, National Commission for Knowledge and Use of Biodiversity (CONABIO), Mexico City	16
	CITES Management Authority Mexico, Dirección General de Vida Silvestre, Ministry of Environment, Mexico City	17
	Zoological Park, Chiapas	18
Producer	Private producer of live reptiles (native and non-native species), Mexico City and Chiapas	19
	Private producer of caiman and crocodile skins (native species), CAICROCHIS, Mexico City - Tapachula, Chiapas	20
Manufacturer	Private saddler (<i>talabartero</i>) of caiman and crocodile skins (native species), Tapachula, Chiapas	21
Intermediary	Private live animal re-seller (native and non-native species), Morelos market, Mexico City	22
	Private live animal re-seller (native and non-native species), Mixhuca market, Mexico City	23
Intergovernmental organisation	United Nations Office on Drugs and Crime	24

Findings

Nature and extent of illegal wildlife trade between the EU and Mexico

In total, 279 illegal entries from the combined three data sources were studied, from which 159 correspond to wild animals ($n = 84,917$) and 120 correspond to wild plants ($n = 5,192$). From the total, 201 cases correspond to CITES Appendix II, 52 to Appendix I, 15 species are not listed in CITES, and in 11 cases, it was not possible to determine if they are CITES listed or not, as entries are described only on the order or family level rather than the species level, which is needed to determine listing in Appendix I or II. To examine the nature and extent of the illegal wildlife trade contained in these data, we analysed the EU countries involved, as well as the species and type of product trafficked, broken down by the five categories.

Non-timber products

In total, 24 genera were found in the data (see Table 2 [Appendix A]). Most reported illegal incidents involved live specimens. The plants traded illegally were mainly cacti and orchids, as well as flowering plants, such as saxifragales and bromeliads. All of these species seem to be in demand as either collectors' items (orchids) or presumably decorative plants in European gardens based on sales at horticulture fairs. *Echeveria* (a large genus of flowering succulent plants in the stonecrop family) was the only genus not listed in the CITES appendices. However, it is important to note that 12 species of the genus *Echeveria* are included in the Mexican National Red List (NOM-059-SEMARNAT-2010), which means they are nationally protected (DOF 2010).

The following countries were recorded as the main European countries importing non-timber species from Mexico: Austria, the Czech Republic, Germany, the Netherlands, Slovenia and Sweden. The Netherlands was the main importing country (mainly live orchids), followed by the Czech Republic with a range of species being imported. In turn, the main exporting European country was France, followed by the Czech Republic (both exporting principally live cacti).

Art decor, jewellery and trophies

This category of illegal trade has the greatest diversity in terms of having species from 14 different orders. These range from elephants to carnivores (big cats) and from corals to tortoises (see Table 3 [Appendix A]). Raw corals, shells and bodies are the most frequently illegally traded 'items' in this category.

The following were recorded as the main European countries importing from Mexico: Austria, the Czech Republic, Germany, Finland, France, Italy, the Netherland, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the UK. Of these, Austria, the Czech Republic, Germany, Italy, Poland, Slovenia, Spain and the UK were the main importing countries of corals, the largest volume of commodities traded illegally in this market. In turn, the only European country (re) exporting to Mexico was Italy (mainly *Panthera onca* [jaguar] skins). As evident from the category title, the demand for these species is for use as/in luxury items.

Fashion

The vast majority of products for the fashion category come from species of reptiles (see Table 4 [Appendix A]). Feathers from parrots also comprise a significant portion of the illegal trade. The main taxa reported as CITES Appendix I species were large leather products from Chinese alligators (*Alligator sinensis*). The CITES Appendix II species most traded illegally were reticulated pythons (*Python reticulatus*) and oriental ratsnakes (*Ptyas mucosus*). Their skins are also used to make belts, purses, shoes and other items.

The main European countries importing fashion products, or at least material to be used in fashion products, from Mexico were Austria, Denmark, Germany, Greece, Hungary, Italy, the Netherlands, Poland and the UK. Of these, Austria and Italy were the main importing countries of

skins and leather products (Italy in particular, imported a wide variety of taxa). In turn, Germany and Italy were the main European countries exporting the largest percentage of skins and leather products to Mexico.

Live animals—breeding, pets and zoos

A wide range of species is traded to satisfy demand for breeding, pets and zoos. These include arachnids (such as tarantulas), birds (e.g., falcons, parrots), primates and reptiles (e.g., crocodiles) (see Table 5 [Appendix A]). The military macaw (*Ara militaris*) was the predominant CITES Appendix I species being traded illegally. Tarantulas—*Brachypelma smithii*, *B. auratum*, *B. boehmei* and *B. annitha*—were the main CITES Appendix II species.

Austria, Germany, the Netherlands, Poland and Spain were the main European countries importing this illegal wildlife from Mexico. In turn, Germany, Latvia and Spain were the main European countries exporting illegally to Mexico. The vast majority of the tarantulas (*Brachypelma*) were trafficked from Germany and the majority of bird species from Spain. The patas monkey (*Erythrocebus patas*) was the only mammal reported in this market and was illegally (re)exported from Latvia.

Tonics and medicine

Tonics and medicine is the least diverse market of all, with only three records of three different species, all of which were exports by Mexico: one unit of medicine of *Euphorbia antisyphilitica* (*candelilla*) was imported by the Netherlands in 2010; 30 units of medicine reported as *Hoodia* spp. (a plant used for weight loss) was destined for Germany in 2011 (it is unknown if this included fake *Hoodia*); and three units of extract of *Opuntia ficus-indica* (Barbary Fig) were imported by Germany in 2015.

Geographic patterns

As mentioned previously, there are geographic patterns to the trafficking between the EU and Mexico. In particular, cacti predominantly are smuggled to Austria and the Czech Republic and from the Czech Republic and France into Mexico. Lizards and snakes are trafficked from Germany to Mexico in the form of leather products and skins. Tarantulas are also exported illegally from Germany to Mexico. Birds, such as raptors and songbirds, are trafficked from Mexico to Spain. It is important to note that these patterns are not static. Trafficking (and trade) trends shift over time, so it is essential to also analyse changes in wildlife consumption trends. For instance, illegal trade of reptile skins from Italy had been more prevalent several years ago. We will return to the geographic patterns when analysing under an eco-global criminological framework.

The involvement of organised crime

Respondents commented on the fact that in 2016, Mexico's legislation did not match the definition of organised crime in UNTOC, which as mentioned requires a structured group of three or more people existing over a certain period. Instead, in Mexico, organised crime was simply crime involving more than one person, so almost all crime could constitute 'organised crime'. Thus, at the time, nearly everything that was happening in terms of wildlife trafficking would be defined as organised crime. Our respondents felt that it was most likely not the case that organised crime was involved in all trafficking of wildlife (Respondents 1, 6 and 16, personal communication 2016). Respondents believed that for aquarium fish and some timber, there is a level of organisation involved in the illegal trade that certainly involves numerous people. They stated, however, that this might constitute *conspiracy* or *collusion* (meaning a group of people planning a crime) rather than a serious organised crime group.

There were three examples for which our respondents felt that there was sufficient evidence in terms of investigations and witnesses to state that organised crime was involved in illegal wildlife

trade: totoaba, some timber and sea cucumber. None of these three wildlife black markets, however, involve the EU, at least directly. Thus, they do not feature in any of the seizure data presented here. Totoabas are fish native to waters off the coast of the Mexican state of Baja. The fish are poached for their swim bladders, which are in demand in China as an ingredient in traditional Chinese medicine. The demand has increased dramatically in the last years because the fish that the Chinese once used—the Chinese bahaba—has been poached to near extinction. Thus, in what appears to be a classic criminological case of displacement, the totoaba is now the target of organised criminal groups, which orchestrate the poaching of the species to satisfy demand in the Chinese market (Martínez and Martínez 2018). Again, this does not appear to involve the EU. Swim bladders are smuggled north out of Baja into the US state of California, and smuggled from there to China. Respondents indicated that the totoaba is smuggled by former drug cartels, which used to smuggle cocaine but abandoned that market because totoaba smuggling was much more profitable and less risky (Respondent 1, personal communication 2016; Martínez and Martínez 2018).

Similarly, the Michoacán drug cartels of the central Mexican state of Michoacán combine traditional drug smuggling with wildlife trafficking (Cortés Calderón 2018; Huerta García 2018). In this case, respondents indicated that the cartels smuggle timber. A respondent from the UNODC stated that Mexico is a special case for organised crime in general because of the prevalence of drug trafficking and the cartels involved. It is not clear where smuggled Mexican timber is trafficked. Eventually, it may be transported to the EU as part of the range of wood products that enters the region, but more research is needed to unpack the value chain related to Mexican illegal timber. Finally, one respondent (Respondent 6, personal communication 2016) indicated that sea cucumbers were trafficked by organised crime. This is another species in demand for use in traditional Chinese medicine, and for which demand has expanded to other parts of the world because the populations of these species in Asia are so depleted. Again, this appears not to involve the EU but smuggling in the other direction, west from Mexico to Asia.

Analysis

Illegal wildlife trade between Mexico and the EU (and likely other regions) is clearly an eco-global crime due to its transnational nature, the interconnectedness of ecosystems, the presence of harms (rather than crimes) in addition to crimes, and the differences at local and regional levels. The transnational nature of the illegal wildlife trade in this context is evident from the trafficking of several species between Mexico and numerous countries in the EU. Sixteen EU countries have been documented as receiving illegal exports from Mexico and at least four EU countries have been recorded as illegally exporting to Mexico. Further evidence of the eco-global nature of the crimes and harms taking place is that much of the trafficking between Mexico and the EU is not confined to species that are native to either of the two regions. Often, additional countries from other regions of the world are involved. For instance, the reptile leather industry sources snakes and lizards from South-East Asia; these are transported to Mexico and/or the EU, and then the reptile skins are manufactured and processed, and again transported between Mexico and the EU. While much of this is legal, there is evidence that some illegal trade takes place. It is also suspected that the captive breeding programs in South-East Asia provide a means to launder illegally caught wild reptiles into the legal industry (Nijman and Shepherd 2009; Lyons and Natusch 2011; Natusch and Lyons 2014; Auliya et al. 2016). This is just one example of the global transnational nature of the illegal wildlife trade involving these two regions.

While there was no evidence from the trade data or from our interviewees of the interconnectedness of the Mexican and EU ecosystems, it was clear that, in general, ecosystems of one region fill the demand for certain wildlife products in other regions. For example, cacti are native to Mexico and some countries nearby (e.g., the US). There is a significant market for cacti in the EU and Mexico's ecosystem often supplies the plants to meet this demand. Thus, while

ecosystems in this instance may not seem directly interconnected, the consumer demand in one place (the EU) can affect the ecosystem of another place (Mexico) by depleting its biodiversity and potentially contributing to extinctions. Further, non-native species can cause environmental damage in new ecosystems if they become invasive (like Japanese knotweed in the UK, which alters ecosystems and damages waterways) (Royal Horticultural Society 2018).

Although it did not involve the EU, the earlier example of the totoaba is another instance in which the ecosystems are not directly interconnected, but the consumption in one place has consequences for the ecosystem in another region. In the case of the totoaba, the extinction of the Chinese bahaba has now led to the possible extinction of the totoaba because the swim bladder of the totoaba is being consumed as a replacement for the bahaba in traditional Chinese medicines. This has local social and environmental implications for the Gulf of Baja, Mexico, where the totoaba may become extinct (and so might the vaquita that is inadvertently caught along with the totoaba). Fishers in the region may suffer socio-economic consequences due to the loss of a profitable fish. The environmental implications are the loss of a species from an ecosystem, which will have as yet unknown consequences for the biodiversity and health of the whole ecosystem. Further, in terms of animal abuse and species justice (Wyatt 2013; Sollund 2016), the capturing and killing of the totoaba, and starvation and killing of the vaquita, are also harmful.

Another aspect of eco-global criminology is its departure from mainstream criminology's focus on only that which is defined as criminal as opposed to that which may be legal, but harmful. There are several aspects of the illegal wildlife trade involving Mexico and the EU that are made visible from the harm-based perspective of an eco-global criminology. While the incidents documented here are crimes, often the conditions that lie behind their perpetration are 'lawful but awful' (Passas 2005). The reptile leather industry, in which Mexico and the EU are key players, provides examples of such harms. For example, skins of reticulated pythons are still taken largely from individual snakes living in the wild (such as from Indonesia and Malaysia) (Kasterine et al. 2012; Natusch and Lyons 2014). When snakes or lizards are taken legally from the wild, the biggest (usually males) are targeted. Over time, this negatively affects the populations by possibly skewing the sex ratios (if males are the species most often removed) and decreasing the health of the overall population by only taking the strongest and/or biggest (Barkham 2007). The decreased range and small overall size of python populations in Indonesia and Malaysia are thought to be signs of species decline (Barkham 2007). Unless strict guidelines outline exactly how non-human animals can be taken from the wild, these harms are all legal.

In addition, the way reptiles that supply the leather industry are slaughtered is abusive in practice. The snakes (either wild-caught or captive-bred) are either starved for several days to loosen their skin or forcefully pumped full of water (Barkham 2007). Snakes are nailed to trees and skinned alive (Barkham 2007). Therefore, use of humane and effective slaughter practices are important to ensure pythons do not suffer before death (Natusch and Lyons 2014). According to a 2013 study (Expert Panel 2013), none of the methods used by China, Thailand or Vietnam were considered 'humane', but there is no animal welfare legislation that prohibits such cruelty in these countries. With the exception of chemical euthanasia, humane slaughter methods for reptiles include only those where destruction of the brain is achieved (Expert Panel 2013; Natusch and Lyons 2014). While this abuse may not occur in Mexico or the EU, the leather industry that they are a part of perpetrates such harm in all places where reptiles are sourced.

Finally, White (2011) proposed that green crimes and harms under an eco-global criminological framework exhibit local and regional differences, even though there are clear geographic patterns. This too is demonstrated in the illegal wildlife trade between Mexico and the EU in terms of the species that have specific geographic flows and also in the presence and/or absence of organised crime in trafficking. Certain countries in the EU seem to be the focus of certain species rather than the same species being trafficked to many countries. For example, tarantulas are associated with Germany, whereas birds are trafficked from Mexico to Spain. Cacti are smuggled

predominantly to Austria and the Czech Republic and from the Czech Republic and France into Mexico. One of the local differences this raises is in terms of the law enforcement response. For example, trying to uncover the smuggling of a live bird is very different from uncovering the smuggling of a cactus seed. Understanding these local and regional differences is important for developing prevention and detection strategies.

In addition, regions and localities differ with respect to the presence or absence of organised crime. In regard to illegal wildlife trade between Mexico and the EU, we did not find explicit evidence of organised crime involvement. Again, this means adopting a different approach to tackling wildlife trafficking in these local contexts. We did find, however, that organised crime is likely to be involved in the trafficking of totoaba, some timber (this may or may not eventually reach the EU) and sea cucumbers. Why organised crime is present in some wildlife markets and not others remains unclear, although it is likely linked to profitability and sophistication of the markets (Wyatt 2013). A closer examination is necessary to determine whether at the local level, Albanese's (2000) five opportunity factors differ, particularly with respect to economic conditions and enforcement effectiveness. Overall, it is evident that assumptions cannot be made about organised crime or the similarities that may or may not exist between regions and between species of wildlife.

Conclusion

The illegal wildlife trade is an eco-global crime not only because the complex networks of trafficking are interconnected, but also because of the eco-global criminological dimensions of harm. As we demonstrated through investigating illegal wildlife trade between the EU and Mexico, the *perpetration* and *impact* are global in scope and in the harm caused. This is because the crimes are transnational in nature and consequence. Wildlife is trafficked to numerous EU countries from Mexico and, in turn, wildlife is trafficked from several EU countries into Mexico. In several of these wildlife black markets, other regions, such as South-East Asia, are also linked into the complex trafficking flow. Harm in the form of animal abuse, particularly of reptiles, is also transnational in nature. This is because the harm occurs in one place to fill consumer demand in another; consumption has global negative consequences (Agnew 2012).

Illegal wildlife trade has local and regional implications and manifests differently in Mexico in comparison to the EU. Thus, geographic particularities emerge (White 2011). In this case, the differences are in relation to the species that tend to flow to particular EU countries from Mexico and vice versa. A key local and regional difference is the presence or absence of organised crime, the latter of which seems to be less of a component in trafficking between the EU and Mexico. Understanding these differences is important to develop prevention and detection strategies, and support efforts for further global collaborations to tackle wildlife trafficking to protect wildlife around the planet for its own sake and for the communities relying on it.

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¹ Resolution Conf. 8.4 (Rev. CoP15) on National laws for implementation of the CITES Convention directs the Secretariat, within available resources, to identify those Parties whose domestic measures do not provide them with the authority to: i) designate at least one Management Authority and one Scientific Authority; ii) prohibit trade in specimens in violation of the Convention; iii) penalize such trade; or, iv) confiscate specimens illegally traded or possessed. All four minimum requirements need to be met by the national laws (CITES 2019). Under the National Legislation Project, and in consultation with the concerned Party, national legislation is analysed by the Secretariat in relation to these four minimum requirements and placed in one of three categories, as follows: Category 1: legislation that is believed generally to meet the requirements for implementation of CITES; Category 2: legislation that is believed generally not to meet *all* of the requirements for the implementation of CITES; and, Category 3: legislation that is believed generally not to meet the requirements for the implementation of CITES (CITES 2019).

² In Annex 1, Article 2 (a) organised crime is defined as a “structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences established in accordance with this Convention, in order to obtain, directly or indirectly, a financial or other material benefit” (UNODC 2004: 5).

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