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Nested complex crime: Assessing the convergence of wildlife trafficking, organized crime and loose criminal networks

William D. Moreto and Daan P. Van Uhm*

*William D. Moreto, Department of Criminal Justice, University of Central Florida, 12805 Pegasus Drive, Orlando, FL 32816-1600, USA; william.moreto@ucf.edu; Daan P. van Uhm, Willem Pompe Institute for Criminal Law and Criminology, Utrecht University, Newtonlaan 231, 3584 BH Utrecht, the Netherlands

Wildlife trafficking is considered to be an example of a transnational organized crime by policymakers and enforcement agencies. Empirically, however, there is mixed support for this. Recently, there has been increased attention on the convergence of different illegal activities in an effort to share resources, personnel and transport routes. The present study attempts to qualitatively examine the intersection of wildlife trafficking and organized crime from a crime mutualism framework in order to explore how these criminal activities and entities converge. Based on fieldwork conducted in Uganda and China, we find that while organized crime appears to have a presence in illegal wildlife markets, such involvement appears to be more relevant during specific stages. Furthermore, it appears that illegal wildlife markets in both case studies reflect both loose, informal criminal networks and more organized crime groups. These findings have implications for the criminological study of and the response to complex wildlife crime.

Key Words: China, environment crime, mutualism, Uganda, qualitative methods, wildlife crime

INTRODUCTION

Wildlife trafficking has generated significant interest from criminologists and criminal justice scholars in recent years. Researchers have studied a variety of topics that have spanned the globe, including illegal fur and falcon trades in Russia (Wyatt 2009), and parrot poaching and trade in Bolivia (Pires and Clarke 2012). Researchers have explored the existence of illegal wildlife markets in cyberspace (Lavorgna 2014), and its relationship to other traditional criminological topics, like corruption (van Uhm and Moreto 2018), illegal drug markets (Sosnowski 2020) and human trafficking (Moreto *et al.* 2020).

The transnational nature of wildlife trafficking has led to increased attention regarding its intersection with organized crime actors with the narrative suggesting that it is a lucrative enterprise that organized crime groups can infiltrate and profit from (Warchol 2004). This has even

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led to the designation of wildlife trafficking as a specific form of transnational organized crime (UNODC 2016) resulting in considerable attention from national governments and from international enforcement agencies (e.g. INTERPOL). However, empirical studies investigating the overlap between organized crime and illegal wildlife markets have been mixed, with some scholars finding evidence of the involvement of organized crime groups (Warchol 2004; Wyatt 2009; van Uhm and Siegel 2016), while others have concluded that such a link is minimal or non-existent (Pires *et al.* 2016).

The possible intersection between wildlife trafficking and organized crime groups points to the possible role that convergence may have in sustaining and expanding the former (see also van Uhm and Nijman 2020). Specifically, convergence suggests how organized crime actors may collaborate and coordinate with non-organized crime actors to share resources, personnel, equipment and routes, within both legitimate and illegitimate settings to ensure a successful criminal event to occur. As noted by Miklaucic and Brewer (2013):

> Global trends and developments—including dramatically increased trade volumes and velocity, the growth of cyberspace, and population growth, among others—have facilitated growth of violent nonstate actors, the strengthening of organised crime, and the emergence of a new set of transcontinental supply chains as well as the expansion of existing illicit markets […] Their increasing *convergence* gives them ever-improved ability to evade official countermeasures and overcome logistical challenges as well as ever better tools for exploiting weaknesses and opportunities within the state system, and attacking that system […] Since illicit actors have expanded their activities throughout the global commons […] nations must devise comprehensive and multidimensional strategies and policies to combat the complex transnational threats posed by these illicit networks. (xiv, emphasis added)

The present study contributes to the literature by examining the convergence between wildlife trafficking and organized crime from a crime mutualism framework. To do so, we examine how actors may interact and intersect in specific settings, and using particular resources, to ensure product movement throughout the market continuum. We propose an adaptable conceptual model that recognizes the variation that exists between different examples of wildlife trafficking, as well as the distinct stages involved in such markets. This approach accounts for the manifestation of traditional forms of organized crime, as well as loose criminal networks, a necessary distinction that has implications for theory and policy.

CONCEPTUALIZING 'ORGANIZED CRIME'

The United Nations Convention against Transnational Organized Crime (UNTOC) has defined organized crime 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'.[1] Despite this designation, organized crime remains an unclear and ambiguous concept (Fijnaut and Paoli 2004; Kleemans 2014). For decades, organized crime groups were defined as highly structured and hierarchical organizations involved in illegal commodities, services, acts of violence and extortion (Cressey 1969). Moreover, these groups were known to be able to infiltrate both legitimate markets and governments. However, this view has been increasingly questioned by scholars (see Albini 1971; Ianni and Reuss-Ianni 1972).

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[1] Article 2a United Nations Convention against Transnational Organized Crime.

Some critics approached organized crime based upon the enterprise model, while others confronted the model with findings from original empirical research (e.g. Ianni and Reuss-Ianni 1972).

Scholars argued that organized crime was characterized as having a high amount of rationality behind its activities making crime a calculated and profitable endeavour (see Fijnaut and Paoli 2004; Spapens 2010). They drew similarities between illegal and legal activities where offenders are viewed as normal, rational and profit-oriented entrepreneurs (Block and Chambliss 1981; van Duyne 1993). According to Passas (1995), organized crime should display an element of continuity and resilience with a high degree of organization and structure. The ability and willingness to use violence in order to maintain territorial power were also considered to be an indicator of organized crime with such groups using their own governance and internal system to control illegal goods and solve conflicts or disputes (Gambetta 1993; Varese 2011).

Scholars have also suggested that organized crime groups may display a rather flexible and fluid structure (Morselli 2009). In the context of vanishing borders, improved communication techniques, advanced transportation methods, and the growth of cyberspace, the archetypal image of a hierarchical well-structured criminal organization appears to be too narrow (Morselli 2009). According to Varese (2010: 21), in more recent times, 'we observe a rise in allusions to "networks"'. It is believed that organized crime groups diversify their illegal activities to form new collaborations, alliances and fluid criminal networks that cut across borders, infiltrate and corrupt licit markets and penetrate fragile governments (Miklaucic and Brewer 2013; OECD 2016; van Uhm and Nijman 2020). Some of these collaborations are based on ad hoc coalitions rather than established hierarchical systems (Blok 2008), which suggests the existence of more loose, informal criminal networks (Williams 2001; Morselli 2009). These criminal networks can be set up by facilitators and organizers for a specific purpose (i.e. a directed network) or can appear spontaneously to fill a gap in the market (i.e. a transaction network) (Arquilla and Ronfeldt 2001). Notably, individuals who are employed to fulfil a specific act may not have direct investment in the existence or success of the overall criminal enterprise and may not have direct knowledge of additional actors who are involved.

For our purposes, we conceptualize organized crime groups as 'highly-organized, disciplined, rational, and may use violence or corruption to control illegal goods and/or services for profit (…) and ha[ve] existed for a significant length of time' (Wyatt *et al.* 2020: 353). Additionally, there is an attempt to govern the production or distribution of relevant commodities, in this case, wildlife products, unlawfully (Varese 2010). Notably, this definition differs from the definition agreed to in the UNTOC and its accompanying protocols. For instance, opportunistic illegal hunters who sell protected animals or animal products, without having a buyer lined up, would not be classified as organized crime, while an established criminal network that has existed for years with clearly agreed upon duties and working with corrupt government officials to smuggle the wildlife across the borders could be considered as organized crime by this definition.

ORGANIZED CRIME AND WILDLIFE TRAFFICKING: IMPLICATIONS FOR GLOBAL CONSERVATION EFFORTS

The illegal wildlife trade has historically been viewed as an opportunistic crime committed by individuals, collectors and tourists. Starting in the 1990s and into the 2000s, this view changed considerably with various reports suggesting that organized crime syndicates had likely become involved in smuggling wildlife due to the high profits (Søyland 2000). For example, several UN reports linked wildlife trafficking to several traditional organized crime groups. Chinese Triads (e.g. the Wo Shing Wo group and 14K) were believed to have smuggled ivory, rhino horn and shark fin, while the Neapolitan Mafia was said to be behind the illegal trade of endangered parrots. Russian organized crime groups were linked to the illegal caviar trade, as well as tiger and bear poaching (Søyland 2000; Economic and Social Council United Nations 2002; Wyler and Sheikh 2008; van Uhm 2012). Moreover, it was suggested that Colombian cartels would exchange endangered species for drugs resulting in cashless transfers (Kazmar 2000). More recently, it has been suggested that Chinese organized crime groups were involved in the illegal trade in wildlife products for traditional Asian medicine (TAM) in both Asia and Africa (see Milliken and Shaw 2012; Montesh 2013). Gradually, law enforcement organizations also emphasized the strong involvement of organized crime groups in wildlife trafficking. Indeed, INTERPOL (2012: 11) highlighted how '[w]ildlife crime is highly organised and requires extensive experience'.

Within the criminological literature, the existence and involvement of organized crime in wildlife trafficking have also been explored. Based on fieldwork and the existing literature, Wyatt *et al.* (2020) proposed categories of criminal networks: (1) organized crime groups, (2) corporate crime groups and (3) disorganized criminal networks. Whereas there are instances when these groups act alone, they discuss the overlap and interaction that occurs between the proposed categories and discuss the complicated nature of the involved organized criminal networks. Furthermore, Hübschle's (2016) ethnographic fieldwork in South Africa led her to conclude that there was a high level of organization behind some parts of the illegal rhino horn trade, while research of Arroyo-Quiroz and Wyatt (2019: 31) found 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'. In his study, van Uhm (2016*a*) examined the possible role of organized crime in the wildlife trade in Europe based on large confiscations. Based on his assessment, he proposed that 'significant illegal TCM [traditional Chinese medicine] and ivory shipments connected to China, substantial caviar shipments from Russia and a large-scale reptile skin trade from Colombia' may indicate the existence of criminal organizations (110). van Uhm (2020) also emphasized the role of 'criminogenic asymmetries', referring to profits generated by organized crime groups taking advantage of differences in the realms of economy, law, politics, ecology and power between countries (see also Passas 2000). Finally, Wong (2016) also found that tiger part trading networks in China are hierarchal and centralized, in which the traders are involved in selling other goods as well.

Other scholars, however, have found little evidence that points to the presence of organized crime in illegal wildlife markets. For example, Pires *et al.* (2016) found minimal support pointing to the involvement of organized crime in the illegal parrot trade in Bolivia and Peru. In his study of illegal wildlife markets in South Africa and Namibia, Warchol (2004) found that 'the typical poacher, regardless of what plants or animal species they steal, is best described as an individual operator rather than a member of an organised criminal syndicate' (64–5). While Titeca (2019) recently examined the illegal ivory trade in Uganda and highlighted the importance of key local connections and place nodes and concluded that the illicit trade functioned in a manner that was loosely organized and decentralized. Based on the mixed results of prior research, it appears that the assessment of transnational organized crime groups requires a more explicit acknowledgement of the idiosyncrasies of different markets and the species involved (cf. Moreto and Lemieux 2015; Moreto and Pires 2018).

The emphasis on organized crime groups has also impacted ground-level conservation efforts, particularly within the scope of protected area (PA) management and monitoring. Critics have questioned the overreliance on aggressive, militarized anti-poaching strategies, which are justified based on counteracting heavily armed illegal hunters supported by transnational organized groups. For example, the potential involvement of organized crime groups in funding and supporting the poaching of fauna, including elephants and rhinoceroses, in Africa has led to the reliance on militarized anti-poaching strategies to achieve conservation goals (Duffy *et al.* 2015). This has resulted in the reinforcement of a fortress conservation mentality and shift away from localized and contextualized community-based conservation initiatives that might be more suited for particular settings. This in turn may negatively impact community-based approaches and relations due to disproportionately affecting indigenous or local peoples minimizing their support and role as frontline guardians and stewards.

INTRODUCING THE CONCEPT OF NESTED COMPLEX CRIME

As discussed, the existence and role of organized crime within wildlife trafficking is mixed despite governments and national, regional and international organizations branding wildlife trafficking as a transnational organized crime. Indeed, the presence of organized crime groups within wildlife trafficking is often associated with its role within specific stages and thru the manifestation of particular indicators. While organized crime groups may be present or may play a more significant role in specific markets, the assumption that such indicators are solely indicative of the existence of organized crime or that wildlife trafficking *is* a form of transnational organized crime (UNODC 2015)[2] is problematic for several reasons.

First, it neglects important market-specific and species-specific characteristics (see Moreto and Lemieux 2015). The logistics associated with the hunting or harvesting, transporting, trading and processing of products will vary and may or may not require the resources or connections often assumed with organized crime groups. Second, the broad assumption that organized crime groups infiltrate the illegal wildlife market neglects the various interpersonal dynamics involved throughout the trade. In other words, informal local criminal networks may not be directly linked with organized crime groups, but rather fulfil a specific role within the trade (see Warchol 2004). Thus, the presence of organized crime elements may be primarily centred on 'the *most lucrative areas* of the illegal wildlife trade' (Cook *et al.* 2002: 4, emphasis added). Third, the assumption that such indicators refer to the presence of organized crime results in the failure to recognize that particular indicators are on their own unique problems and may have been present prior to the involvement of organized crime groups (i.e. corruption of officials may be linked with systemic problems; see Moreto *et al.* 2015). Last, incorporating wildlife trafficking within the umbrella of transnational organized crime puts forth the notion that the market is only worth addressing by virtue of its association with organized crime, when in reality, wildlife crimes can have considerable ecological, economic, cultural and social implications.

Given the issues with assuming that wildlife trafficking as simply a form of transnational organized crime, we recognize that specific illegal wildlife markets are a unique complex crime and not just a manifestation of organized crime groups. Complexity is key here as illegal wildlife markets can also be simple criminal endeavours. For our purposes, we focus our attention on illegal wildlife markets that have amplified complexity through the involvement of multiple activities, actors and settings, which may involve a transnational component. This view is similar to how Cornish and Clarke (2002) viewed organized crime when they stated its 'commission involves a complex interplay of criminal actors, equipment, locations, and activities' (42). Tremblay *et al.* (1998) also emphasized the opportunistic and complex evolution of illegal markets over time within and across particular settings by addressing the links and chains within these networks. It is within this complex interplay that a variety of actors, settings and resources may overlap. Moreover, as a unique complex crime, we acknowledge the context- and species-specific nature of wildlife trafficking and the varying levels of organization and resources required at the various stages (see Moreto and Lemieux 2015).

[2] Accessed on 12 April 2015 from: http://www.unodc.org/unodc/en/frontpage/2013/September/wildlife-trafficking-is-organised-crime-on-a-massive-scale-warns-unodc-head.html

We argue that the intersection between organized crime actors and wildlife trafficking at specific stages and involving particular logistics, equipment and resources require an appreciation for their *nested* nature. As such, we define nested complex crime as *criminal activities, actors, settings, equipment, and stages unique to a criminal entity or complex crime type that are incorporated within the phases of another complex crime type*. This definition accounts for the possibility of criminal entities, including organized crime groups, as well as other complex crimes, like drug trafficking, becoming intertwined with the actors, products, stages and resources involved in wildlife trafficking. As our primary focus is on wildlife trafficking, we investigate the nested nature of organized crime actors *within* illegal wildlife markets.

THE SYMBIOTIC AND STAGE-SPECIFIC NATURE OF ILLEGITIMATE ACTIVITIES: A FRAMEWORK TO INVESTIGATE NESTED COMPLEX CRIME

The introduction of nested complex crime provides the foundation to apply a conceptual framework useful in understanding how distinct crimes coalesce. Felson (2006) described the notion of crime symbiosis to explain how two or more parties can become involved in a 'close and prolonged relationship' to further illicit activity that provides 'benefit to at least one of them' (163–4). Such relationships can manifest in several ways, including crime mutualism, parasitism and forms of passive assistance. Crime mutualism can involve both illegitimate and legitimate activities (interactions can be illegitimate–illegitimate and illegitimate–legitimate), and typically involves the exchanging and sharing of resources, the stopping of mutual adversaries and the spreading of crime (Felson 2006). Crime parasitism, on the other hand, is an antithetical relationship, and occurs when one party benefits at the expense of the other party. Forms of passive assistance happens when one party benefits without necessarily harming or helping another party (Felson 2006).

For our purposes, we draw from Felson's (2006) concept of crime mutualism to form part of our conceptual framework. It is important to note that the benefits obtained from mutualistic relationships are not necessarily equal (at least objectively), nor are such relationships permanent. As explained by Felson (2006):

> A 'net benefit', does not mean that crime is beneficial in all respects and forever. Yet both the offender and counterpart mostly get what they want for a while […] A mutualism does not need to be an intense relationship. Even if encounters are brief, participants can gain repeated benefits over time […] Thus a mutualism implies ongoing cooperation, but not forever. (182)

As mentioned earlier, Felson's (2006) definition of mutualism is based on the assumption that while the parties involved in a mutualistic relationship are collaborative, they nevertheless remain separate and distinct. As a result, these ongoing partnerships may be viewed as forms of crime convergence. In other words, such relationships are predicated on established conditions between parties (e.g. agreeing to provide resources). However, it is possible that the convergence of two or more parties may result in the formulation of a new entity as well (see van Uhm and Nijman 2020). As discussed earlier, based on anecdotal information and prior empirical evidence, it appears that wildlife trafficking and organized crime may display some level of convergence.

However, given the diverse stages and individuals involved, particularly those that cross borders (see Moreto and Lemieux 2015), it is possible that illegal wildlife markets and organized crime may converge only at specific phases and at varying degrees. Thus, we endeavoured to explore how a crime mutualism framework may explain how such convergence manifests during specific stages. Namely, the *sourcing,*[3] *transporting* and *trading* of illegal wildlife products (see also Wyatt 2013; Moreto and Lemieux 2015; van Uhm 2016*a*). By focussing on circumstances of interaction, as opposed to aggregate assessments of mutualism between complex criminal activity, we believe we are able to better reflect on the role of organized crime in the taking, transporting and trading of illicit wildlife products locally, regionally and globally.

DATA AND METHODS

We examined the experiences and perceptions of individuals familiar with illegal wildlife markets in two countries: Uganda and China. The empirical data used for the present study stem from separate qualitative research projects that examined frontline ranger perceptions of their occupation and wildlife crime (Uganda) and illegal hunters, smugglers and traders in the illegal wildlife trade (China). Data for both projects originated from the authors' doctoral research and include separate follow-up research (see Moreto 2013; see also van Uhm 2016*b*; van Uhm 2018; Moreto and Charlton 2021). For the purposes of the present study, our research objectives were two-fold: first, we sought to investigate respondents' orientations towards the potential existence and influence of organized crime within illegal wildlife markets in each of the study settings. Second, we assessed the applicability of a stage-specific crime mutualism framework to explain the nexus between wildlife trafficking and organized crime actors.

The authors utilized an ethnographic approach that relied on semi-structured interviews, informal conversations and participant observations. This methodology was suitable given the broad scope and exploratory objectives of the researchers. The method of semi-structured interviews was chosen as it accommodates flexibility compared to fully structured interviews, allowing for additional probing, while the informal conversations and participant observations facilitated triangulation (Patton 2015).

The Uganda data derive from two separate studies conducted by the first author involving the Uganda Wildlife Authority (UWA). The UWA is the national agency responsible for the management and monitoring of Uganda's PAs and its wildlife. The first author visited and collected data in Queen Elizabeth National Park during September and October 2012 and performed additional site visits in three PAs (Kibale National Park, Lake Mburo National Park and Queen Elizabeth National Park), UWA headquarters in Kampala, and Entebbe International Airport/Uganda Wildlife Education Center between June and August 2014. The PAs chosen varied in topography, biodiversity, organizational structure and community relations. The UWA headquarters in Kampala and Entebbe International Airport/Uganda Wildlife Education Center were specifically included in order to further assess wildlife crime problems (e.g. smuggling) in key nodes (see also Titeca 2019).

The second author carried out an ethnographic fieldwork in November and December 2013 in China. He visited different cities across China, including Anguo, Beijing, Guangzhou, Harbin, Hong Kong and Kunming among others. During the fieldwork, the second author formally interviewed and engaged in several informal conversations with informants involved in the illegal wildlife trade in order to understand the organization of the illegal trade. Additionally, in 2016 and 2019, the second author collected data to understand the convergence between illegal wildlife trade and other serious crimes in the border area of China and Myanmar (Burma). For the latter study, the author conducted fieldwork and talked to traders, smugglers and representatives of local communities in the border area in Yunnan province in Southern China and Shan State in Northeast Myanmar (Burma).

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[3] Prior researchers have referred to the initial stage of the illegal wildlife trade as 'poaching', however, we refer to it here as 'sourcing' as we believe this term is more inclusive of the various types of illegal harvesting or hunting that may occur, including retaliatory (see Moreto 2019). However, we acknowledge here the pre-stage of demand as this is the main driver behind the illegal wildlife trade (van Uhm 2016*a*; Sollund 2019).

For the Uganda case study, a utilization-focused sampling approach was first used, which 'involves selecting cases that will be relevant to the issues and decisions of concern to an identifiable group of stakeholders or intended users' (Patton 2015: 295). Within this, operational construct sampling was employed to ensure that 'real-world examples' were chosen to facilitate 'deepening or verifying theory in new contexts, new time periods, or new situations' (Patton 2015: 289). In total, 24 rangers were included in the first study in 2012, while 89 study participants were included in the second study in 2014, resulting in 113 respondents from Uganda. Due to the former being drawn from only one site, study participants were also randomly selected to reduce concerns as to why they were asked to participate. For the China case study, study participants were in first instance found in wildlife markets and identified by the second author as sellers of illegal wildlife products through initial conversations. Additional study participants were then identified through snowball sampling, which is useful in contacting members of a population that are difficult to access (see also van Uhm 2018). In total, 67 study participants were included in the 2013 China sample and 34 in the 2016 and 2019 sample. The majority of the respondents were directly or indirectly linked to the illegal wildlife trade, including illegal hunters, smugglers, middlemen and traders. As a result, the data here are based on interviews with 214 individuals familiar with the illegal wildlife market in their respective settings. All respondents provided their informed consent, and all interviews were conducted in private and voice recorded unless the respondent declined. Interviews lasted one hour on average. To ensure confidentiality, pseudonyms are used in place of the respondent's real name in this article.

Participant observation was also used to identify, observe and understand group dynamics, as well as to moderate the outsider status of the researchers. It was believed that by doing so, rapport and trust could be further developed with the study participants. Participant observation also provided opportunities to obtain essential information by observing and interpreting behaviour and everyday practices (Spradley 1980). Furthermore, we were able to engage in informal conversation and member checks throughout the study period, which was helpful in clarifying and confirming data collected from interviews (see Lincoln and Guba 1985). Data from participant observations were collected thru detailed field notes.

A three-prong approach was used to code and analyse data. First, after discussing and identifying key concepts associated with the crime mutualism framework, each author performed preliminary manual coding on their respective data. This preliminary coding approach was necessary to ensure that the data were coded with reference to the appropriate context in which the data were collected. Second, these data were then re-analysed by using first-order hypothesis coding or the 'application of a researcher-generated, predetermined list of codes to qualitative data specifically to assess a researcher-generated hypothesis' (Saldaña 2016: 171). Codes were based on concepts associated with crime mutualism concepts, including its functions and related benefits (i.e. exchanging of resources, stopping of mutual enemies and spreading and reproducing criminal opportunities). Codes were also categorized by the different stages of the illegal wildlife trade that has been identified within the literature, specifically, sourcing, transporting and trading (see also Wyatt 2013; Moreto and Lemieux 2015; van Uhm 2016*a*).

Next, second-order elaborative coding or 'the process of analysing textual data in order to develop theory further' (Auerbach and Silverstein 2003: 104) and refined first-order codes to support theoretical propositions associated with crime mutualism concepts. This deductive analytical approach was viewed to be the most suitable for the present study given that we were operating from *a priori* viewpoint about the utility of a crime mutualism framework (see Patton 2015).

As with all research, our study has limitations. Given the in-depth and localized nature of our study, the transferability of our findings may be limited to other settings (Lincoln and Guba 1985). However, we believe that the theoretical propositions outlined in this study are transferrable nonetheless (see Yin 2009). Additionally, the credibility of our data collection and subsequent findings may also be called into question. For example, in our study, 'organized crime' is used as an emic concept, i.e. how local people perceive and categorize the world (Kottak 1996). We believe, however, that we were able to minimize threats to the credibility of our study through multiple prolonged engagements within our respective study sites. Moreover, we participated in member checks to ensure that our initial interpretation and documentation of the data was reflective of what was iterated by interview participants or observed by the authors (Lincoln and Guba 1985). Finally, we were also able to triangulate our data by employing multiple methods of data collection (Patton 2015).

FINDINGS

We now present our case studies on the convergence of the wildlife trafficking and organized crime actors in Uganda and China. Our findings suggest that while organized crime appears to be present within the illegal wildlife trade in both countries, its existence and role varies considerably. Moreover, based on our assessment, it appears that the assumption that wildlife trafficking is a form of transnational organized crime oversimplifies illegal wildlife markets. Importantly, mutualistic relationships were present in our case studies and varied in terms of their form, function and frequency. As a reminder, our research objectives are as follows: to investigate respondents' perception towards the potential existence and influence of organized crime within wildlife trafficking in each of the study settings, and next, to assess the applicability of a crime mutualism framework to explain the nexus between wildlife trafficking and organized crime. For ease of presentation, we address both of these objectives concurrently throughout our case studies.

Case study: Uganda

Transnational organized crime groups appear to have some influence over the illegal wildlife trade in Uganda, particularly as it relates to ivory trafficking. However, such involvement appears to be more pronounced at specific stages: during in-country facilitation of local illegal hunters, trading of raw ivory from local illegal hunters, storing and processing in Kampala and facilitating transportation from Entebbe airport to its eventual destination. Conversely, other stages are more reflective of an informal, loose criminal network involving the hiring of individuals to perform specific tasks but who are not directly part or even cognizant of the inner workings of a larger criminal enterprise.

One respondent, Edward, mentioned how the 'criminal gangs' in the illegal ivory trade involved were 'international illegal wildlife traffickers', while Joshua believed how 'ivory trafficking' could not occur 'without organized crime' since it operates 'top [to] bottom'. Kenneth simply called into question the abilities of local citizens in coordinating a transnational criminal activity when he empathically said: 'Do you think a normal person in Uganda can do this (trafficking in wildlife products)? This is Uganda!' James also echoed this sentiment when he said, 'Ivory trafficking, it is something which is not … you can't deal in ivory if you are poor. It is something which is managed by rich people'. These perspectives suggest a direct, frequent and more formal mutualistic relationship between organized crime and ivory trafficking, with the former explicitly managing coordination efforts.

Respondents, however, were also cautious in asserting that the *entire* illicit trade was managed and operated entirely by a criminal organization and stressed how there are 'several people involved' (Joseph) throughout the course of the trade. Participants surmised that involved individuals were not necessarily focused on the same objectives, shared profit, or were even aware of one another's involvement or presence. For example, respondents described that those directly linked with the international *transporting* and *trading* of wildlife products were often situated within or near Kampala and would send their 'agents to nearby communities' around the PAs (Emmanuel). Joseph also described how individuals operating in Kampala 'don't know how to come to the source (illegal hunters), so they send the intermediaries to go and get it (product) and transport it to them'. Edward further explained the process that involved middlemen or 'co-ordinators':

> For them (coordinators), they know first-hand the poacher who kills the animal. So, they contact that person to kill when they know that the market is there. The money has arrived. Someone has arrived with the money. So, [the coordinator] connects this one who is from out [with] the money to the final person. For him, he acts as a mediator. So, for him as a middleman, he benefits from both sides.

From the information provided by study participants, it appears that the illegal trade in elephant ivory in Uganda resembles more of a loose criminal network rather than one that functions as a unified criminal enterprise. In other words, individuals were hired in an informal manner to fulfil a specific function. While these individuals may have long-term and frequent interactions with coordinators, they themselves were not embedded within a structured hierarchy. For example, with reference to the *sourcing* of the product, Vincent stated how 'locals go and they poach' and work with 'their dealers', and Andrew also mentioned how illegal hunters are 'hired' and 'connected, for sure'. He elaborated:

> They go poaching [and] when they get the stuff, immediately they call their buyers [and say], 'We have got this and that, you come and we see. Come in to discuss'. They are highly connected with the buyers […] Should they succeed in poaching, [they are] assured money ready for them.

While such connections between illegal hunters, local buyers and middlemen appear to be well developed, our data suggest that such dealings were simply between immediate parties and did not necessarily reflect investment in a broader criminal initiative. Wilson described this when he said, 'They (middlemen) use people within there (PA) to do that (illegally hunt). And the chain is very long: one pays the other one'. When asked whether the local illegal hunters were aware and familiar with all individuals' part of the 'chain', he added:

> No, they don't [know other people involved]. To me, they don't know the person in Kampala completely. They know someone else, who again, knows someone else. Like that […] Now the poacher killed the elephant with poison, then he sold the ivory to another person in there at a certain rate, which is the cheapest. Now, that person also links up again with another person. Sells that ivory to that person. Then that person then links up with another person within Kampala here who then goes and pick that ivory from there.

In addition to having little to no knowledge of other individuals involves in the illicit trade, some respondents also highlighted how local illegal hunters had little knowledge of what would eventually happen to the ivory further indicating a loose criminal network. This points to a lack of in-depth knowledge amongst and between the individuals involved and highlights the informality of these transactional agreements. Godfrey, for instance, described how arrested illegal hunters would often state how they would be hired and facilitated by a 'rich man in Kampala'. He elaborated:

> So, elephant [hunting] is not just by the poacher. There are other people involved in the [overall] act. So, that is the racket I am talking about, yeah […] They're (poachers) are hired. They're hired. Because I think they don't even get enough money for this too. 'Cause they don't even know how it [ivory] is used. They're never seen how ivory is used and don't know what comes from ivory. How exquisite it is.

As indicated by Godfrey's response, another key aspect that signified the involvement of organized crime groups were the resources provided to the local illegal hunters. In his response, Robert described the involvement of 'big bosses who inject (provide) money for that activity (illegal hunting)'. And Joseph elaborated:

> [They] provide maybe, like, acid. Once the elephant is killed, you pour acid, and it corrodes those areas [on the elephant], so that you can pull out the tusks easily. So, [they] provide the acid and provide a gun, so that they (illegal hunters) can kill the elephants. And then probably a vehicle so that the ivory [is] taken and not noticed.

The provision of resources illustrates a mutualistic relationship based on the sharing of resources: illegal hunters would provide their time, knowledge and skill to *source* the product, while their facilitators would provide the equipment and transportation needed to successfully remove and *transport* the product. Respondents also commented on how hunters, transporters and traders, who had more established connections with organized crime actors, would be able to easily bribe authorities or pay fines pointing to the ability to stop mutual adversaries (i.e. authorities; see also Moreto *et al.* 2015).

While most respondents focused on the international illegal wildlife trade, others also noted how the local illegal bushmeat trade also involved some level of organization. For example, Moses offered how illegal hunters were 'hired to poach the animals in the land' and would then 'bring to where there is a market [since] there are people who likes [wild] meat'. Similar to the international market, however, this appeared to be reflective of more informal agreements and dealings.

Another indicator of the informal and loose nature of ivory trafficking in Uganda is the fact that some illegal hunters would hunt without any immediate knowledge of who they could eventually sell the product to. In other words, illegal hunters would simply hunt with the expectation that they would be able to find a middleman at a later date. This reality questions the direct involvement and influence of transnational criminal groups at the *sourcing* stage in these specific circumstances. Indeed, during one drive to a ranger outpost, a sponsor/informant commented on how illegal elephant hunters could be classified into three broad categories: those that have direct connections with crime syndicates, those that have immediate and direct knowledge of middlemen that could facilitate an exchange, and those that simply hunt and hope for an opportunity to trade or sell the product in the future.

Interviews further substantiated this belief. For example, Robert explained how 'a very poor farmer goes to dig a pit for killing an elephant because he knows there is a boss who will bring him money'. Vincent added, 'It is two way: some do it on order. Others just poach and keep in case market comes up [then] they sell'. Once again, this displays a mutualistic relationship in that at some point, illegal hunters and middlemen would benefit from one another, but neither are wholly dependent on the other for their survival. Notably, Asiimwe even discussed how some illegal hunters may be concerned or fearful of some buyers further pointing to a lack of an established and cohesive organization at all stages:

> Some do hunt not knowing that they're going to get a potential buyer. Even sometimes, they find ivory, but the person [that was] going to buy isn't giving them this money. So, they decide not to sell. And again, some people do stay (keep) with the ivory, [because] they fearing the buyers themselves 'cause buyers have killed poachers. It happened two times [here]. Poachers were killed by buyers.

In general, it does not appear that organized crime groups are directly involved in the illegal hunting of elephants in Uganda but may hire and facilitate local operatives to coordinate and perform stage-specific activities. Beyond the sourcing stage, the presence of organized crime groups appears to become more pronounced, however. For example, respondents referred to the challenges associated with investigating the illicit trade prior to its immediate smuggling or *transporting* outside of the country. Such investigations were partly restricted as a function of the potential long-term collusion with top government officials (cf. van Uhm and Moreto 2018). Wilson, e.g. stated how 'foreigners […] may be working hand in hand maybe with some top guys in the government' and Kenneth expressed:

> Invisible hand is in the product. You may investigate and be squeezed by the hand. It must be well coordinated and [involving] serious connections.

In his response, Boaz emphasized the difficulty in investigating the illegal wildlife trade due to the involvement of powerful business and government persons:

> These operations involve big businessmen who are in the government. People in the system, you know? Yeah. So, it is not very, very light thing, you see? […] It takes time [to investigate] and when you go there, at times, [I] fear that maybe it is the chain of people involved, big people in the government […] It's not an easy operation.

Other respondents indicated that low-level forms of corruption at the Entebbe airport also demonstrated the highly connected nature of the market at this stage. For example, Andrew mentioned how 'On most cases, those guys are highly connected […] They have people, informants, who always tell them, "Wildlife people are not here, you can come" and [then] go exporting the product', while Emmanuel explained how traffickers would 'connive with people working at the airport [and] bribe even the supervisor'. Based on this, it appears that the later stages of the illicit ivory market in Uganda displays mutualism between illicit and legitimate parties, and highlights the role of limited, ineffective or corrupt governance. Specifically, organized crime actors may depend on corrupt public officials to facilitate the *transportation* of illegal products by stopping mutual adversaries by obstructing investigations by authorities. Finally, organized crime groups may coordinate with airport employees to transport products out of the country suggested the overlap of both legitimate and illegitimate access, resources and personnel.

Case study: China

Criminal networks in China have been traditionally described as banned underworld organizations and branded as mysterious secret societies. While these organizations were believed to have been almost eradicated during the Communist period from 1949 onwards, in the post-Mao area these secret societies returned due to less political control, the market economy being reformed and more socioeconomic freedoms for Chinese citizens. The emergence of these secret societies, triads and other organized crime groups would be closely related to massive unemployment, economic inequality, relative deprivation, criminal subcultures, political corruption and globalization (Chen 2005; Chin and Zhang 2007).

The involvement of Chinese organized crime in the illegal wildlife trade appears mainly related to the *outsourcing* of illegal hunters and *transporting* the wildlife into China and protecting *trading* in wildlife. Similar to the Uganda case study, the involvement of organized crime is particularly linked to high valued species, such as rhino horn, tiger bone and ivory (van Uhm 2019). Chinese crime groups appear to have different mutualistic relationships with (1) other crime actors, (2) officials and (3) militia, with each being influenced by the specific stage where such mutualistic relationships operate within. The relationships are important to coordinate the incoming trade between source countries and China.[4] For instance, illegal hunters of wildlife in Shan State in Myanmar (Burma) referred to Chinese crime groups that collect the high valued animal products, such as tiger and leopard skins and bones and pangolin scales. Zanh, a Wa middleman in a small village near Kengtung, explained that he started his business 15 years ago financed by ethnic Chinese dealers. These individuals would directly be involved in organizing and financing the trade and would have connections with deeper trade channels throughout Asia. Reflecting on their own experiences, Zanh explained how such individuals would be directly involved in the *sourcing* stage:

> At the time, Chinese investors approached a number of people in town to poach for them. We were paid for this every month, and we got weapons and equipment for poaching. After a number of years, I started my own business and arranged the smuggling to Mong La [China-Myanmar border] myself, but the Chinese group that invested in me take it over from there. I now work with several poachers who offer me wildlife and work with two experienced wildlife smugglers. It's good business!

Informants in China also detailed how individuals were recruited for illegal rhino horn *sourcing* and *transporting*. Specifically, they operate as outsourced illegal hunters or as 'mules' in the illegal rhino horn business and are viewed to be largely replaceable role players suggesting a more informal, short-term and possibly one-off agreement. As explained by Wong, a friend of a rhino horn smuggler in Anguo, young adults would be approached by the crime groups to smuggle the horns from South Africa and Mozambique to China. He described how his friend was apprehended:

> They already know him for a while, yes, he needed the money. Now he is in jail, because the police arrested him [...] He smuggled it wrapped in silver foil hidden in hand luggage by airplane. He screwed it up! But there are many others who would like to take over his place.

This illustrates how organized crime groups are flexible, react to arrests and gain access to different actors through mutualistic agreements. This is in line with the broader literature on Chinese criminal organizations as it pertains to reliant, flexible and instrumental social networks that are entrepreneurially oriented and involved in a wide range of licit and illicit businesses (Chin 2009; Lo and Kwok 2012). In other words, while both parties may have mutual benefits from one another, organized crime groups are not wholly dependent on specific illegal hunters or smugglers for their survival.

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[4] For instance, Montesh (2013: 19) and Milliken and Shaw (2012) noticed the involvement of Chinese Triads in the trafficking of rhino horns from South Africa to China.

Some Chinese traders working within illegal wildlife markets in China argued that there was no evidence suggesting that organized crime was involved in illegal wildlife markets and this could largely be attributed to the fact that profits were not high enough. They referred, e.g. to illegal trade in parts of relatively unknown species, such as specific bird species for the bird nests trade or deer antlers offered for sale across China. However, other respondents highlighted the involvement of serious organized crime groups in the *transporting* of wildlife across the national borders. Illegal wildlife traders even discussed the 'mafia-structured' nature of these organizations. Wang, an illegal trader in saiga antelope horns in Anguo, proclaimed that he works together with organized groups involved in smuggling wildlife from Russia, including saiga horns and tiger bones, into the northern part of China. He described how the crime group he worked with would organize border crossings through Heihe at the Russia-China border, which is 'a smugglers town in the upper north'. Wang further explained:

> It is similar to the drug business. You have a relationship with the black business and the white business. It is like a mafia business. […] They smuggle tonnes of hidden pangolins and saiga horns with big trucks (…) but you need connections!

As highlighted by Wang, 'white business' refers to activities by upperworld actors, such as legitimate wildlife companies but in particular corrupt governmental officials that are involved in profiting from the trade, while 'black business' refers to activities from underground actors, such as smugglers or illegal traders along the way. This illustrates the mutualistic long-term relationship between licit and illicit actors, illicit and illicit actors, and how these relationships were needed to successfully *transporting* illegal wildlife shipments into China.

Weng, a known illegal wildlife trader in border town Boten, also discussed the overlap between licit and illicit actors in her statements. She explained how she was able to develop reciprocal relationships with officials in order to smuggle tiger bone wine, pangolins and bear bile into China, further highlighting how corruption functions as a facilitator for crime mutualism. She explained how she had a long-standing agreement with border officials in town who were part of the criminal network. After interviewing her, the second author observed the social and economic embeddedness of crime mutualism between crime groups and officials. Specifically, border officials in town bought food at her restaurant, one that served tiger bone wines openly and fresh pangolins and bear paws were advertised and held in the refrigerator. As further explained by Lihua, an illegal trader of rhino horn and tiger bone in Kunming, in the southern part of China:

> We have already been active for 20 years and it has become highly organised, you know, just like a mafia business. […] We work with the upper and underworld […] Many people are involved in one illegal shipment and our relations with officials work to our advantage.

By explaining where she obtained her tiger bones, Lihua pointed to the border between China and Myanmar (Burma) known for smuggling opium, methamphetamine and wildlife products in the infamous Golden Triangle (see also van Uhm 2019). Dai, one of the wildlife smugglers in Daluo, a small border town in China, referred to the link with contraband typically found within the Golden Triangle, which also illustrates convergence dynamics:

> Many of my friends are in jail for drugs […] Yes, many young people are caught, but we trade in wildlife now, you can get a lot of money, you know. They order elephant skins, ivory, rhino horn, bear bile […] It's all on the market and […] It is easy business, man!

This emphasizes the involvement of flexible and fluid crime networks that are able to anticipate political and economic asymmetries, instead of static and hierarchical crime organizations specializing in one kind of criminal activity. The crime groups are opportunistic small-scale networks, where young individuals are deployed to *transporting* wildlife across the border but there are also multifaceted organized crime groups collaborating with public officials or authority figures and traders on both sides of the border.

As explained by two major tiger bone traders near Kengtung, they negotiate with non-state authorities, such as militias from the National Democratic Alliance Army (NDAA) or the United Wa State Army, in the non-government-controlled border areas of Myanmar (Burma). The illegal tiger traders highlighted that the Wa, operating from their capital Panghsang, controls almost the entire northeast border between Myanmar (Burma) and China, while wildlife hub, Mong La, is under control of the NDAA. Notably, the militias tax large amounts of wildlife to be smuggled into China. Furthermore, opportunistic crime groups have to pay some money to get illegal wildlife across the border. The ethnic Chinese tiger traders also explained how they work with militias in the hunting locations to buy tiger products as well. This further enables the involvement of Chinese organized crime groups in wildlife trafficking and illustrates how the local political economy in such areas facilitates a mutualistic relationship between Chinese crime groups and militia leaders in the *transporting* and *trading* of illegal wildlife products.

In addition to militias and public authorities and officials, study participants also explained how products that proved to be especially difficult to *transport* and *trade*, like rhino horn, required a more direct and explicit partnership with other criminal groups. Chang admitted:

> Yes, you can smuggle many species of wildlife across the border, with or without the help of officials, but rhino horn is currently too difficult! You need professionals to get this done. […] This group of traffickers are active in drug smuggling into Yunnan province and have the 'know how' to get rhino horn across the border.

The difficulty highlighted by Chang led to the requirement of a mutualistic relationship between illegal wildlife traders and drug trafficking groups. This shows that criminal groups do not operate in a social vacuum (van de Bunt *et al.* 2014; van Uhm and Wong 2019), but interact, converge and diversify (van Uhm and Nijman 2020). This mutualistic relationship is further evidenced by confiscations of multiple illicit products during enforcement investigations. For example, a CITES coordinator of Law Enforcement in China commented how confiscated TCM materials had regularly been found combined with other illegal products, including drugs and weapons:

> The smugglers are involved in other forms of crime […] When we recently arrested a wildlife smuggler, we found some other illegal items together with endangered species, such as guns and drugs.

In summary, it appears that mutualistic relationship between different actors in specific settings plays a considerable role in how illicit wildlife products are *sourced*, *transported* and *traded* in China. Similar to the Uganda case study, the existence of organized crime appears to be more relevant during the transporting of products across borders and has a mixed presence during the initial sourcing of wildlife. Additionally, the role of corrupt officials as facilitators appeared in both case studies. Unlike the Uganda case study, however, the involvement of local militia in the illegal wildlife trade in China highlighted an important dynamic often not mentioned in prior research.

DISCUSSION

In this paper, we introduced the concept of nested complex crime and utilized a crime mutualism framework to explore the convergence of wildlife trafficking, organized crime and loose criminal networks in Uganda and China. We sought to examine the interaction and nested nature of organized crime within illegal wildlife markets. Our data suggest that wildlife trafficking is a unique complex crime that may intersect with organized crime during specific stages of the trade. This is distinctly different from statements that designate wildlife trafficking as simply a form of transnational organized crime.[5] The involvement of other actors (e.g. militias) or other facilitating illegal activities (e.g. corruption) further complicates the perspectives on wildlife trafficking. Notably, our study also contributes to further understanding the concept of crime mutualism by highlighting how mutualistic relationships can vary in form, function and frequency.

As summarized in Table 1, our case studies display varying levels of organized crime involvement, with the China case study suggesting a more direct link in the different stages of illegal wildlife markets. Conversely, in Uganda, it appears that organized crime tends to have a more pronounced presence during the transporting of ivory across international borders. Notably, the sourcing stage for both case studies highlighted the mutualistic nature of organized crime actors and wildlife crime actors by signifying how illegal hunters could be contracted to hunt by middlemen representing organized crime groups. Moreover, illegal hunters themselves may hunt unsolicited without any direct links with organized crime groups. Similarly, the selling of illegal wildlife in Chinese markets seems to not be controlled by organized crime groups. The trading and smuggling of illegal wildlife, however, appears to involve organized crime actors. In general, it appears that when present, organized crime may converge with informal criminal networks to expand and utilize local contacts and resources but may not necessarily have full control over the wildlife trafficking operations in its entirety.

The empirical data show that there are different types of actors and activities involved in the illegal wildlife trade. While some activities involve opportunistic individuals, a different set of actors are also involved in protecting market actors and include both corrupt officials, organized crime groups and militia. In these circumstances, organized crime actors demand illegal hunters and traders to pay a tax, operate in the illicit wildlife business as middlemen and traders, or provide protection of key locations or actors ensuring that illegal wildlife is safely shipped out. This suggests a clear governance function in the context of crime mutualism and convergence (see also Varese 2010). Thus, mutualistic relations are established between different actors along myriad stages in order to exchanging resources or stopping of mutual enemies that threaten the illegal wildlife trade.

Our findings contribute to better understanding of the existence and role of organized crime and informal criminal networks within wildlife trafficking by demonstrating how current perceptions and policy suggesting that the wildlife trafficking is simply a new form of transnational organized crime may be misleading. More accurately, transnational organized crime groups may be profiting from an illicit economy that has been historically under-investigated and enforced and has its own unique network of actors and stages; some of which overlaps with other legal and illegal activities and economies. Future studies could examine the applicability of a crime mutualism framework and identify areas of expansion as our findings largely pointed to the existence of facultative mutualism relationships (see Felson 2006). Moreover, researchers should further explore how these mutual relationships may be influenced by local socioeconomic and geopolitical dynamics. As our study was largely exploratory and drawn from qualitative data,

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[5] See, for example, https://www.unodc.org/documents/data-and-analysis/wildlife/WLC16_Chapter_1.pdf and https://www.traffic.org/news/illicit-wildlife-trafficking-recognized-as-a-new-form-of-transnational-organised-crime/

Table 1. *Summary of the function, form and frequency of mutualistic relationships in wildlife trafficking in Uganda and China*

Stage	Function of mutualistic relationship	Form of mutualism	Frequency/length of mutualistic relationship	Case study example: Uganda	Case study example: China
Sourcing	Exchanging and sharing resources	Informal, opportunistic	Short-term, infrequent or one-off	Hunters opportunistically obtain product and provide wildlife	Hunters collect high valued wildlife and provide to dealer
	Exchanging and sharing resources	Informal, arranged/ contracted	Long-term, frequent	Hunters are hired or are provided with needed equipment and resources	Contracting hunters or providing poaching equipment to hunters
	Stopping of mutual adversaries	Informal, arranged/ contracted	Long-term, frequent	Providing resources to hunters to pay fines or bribe authorities	Protecting hunters against interference by the government
Transporting	Exchanging and sharing resources	Informal, opportunistic	Short-term, infrequent or one-off	N/A	Hiring opportunistic traffickers to transport wildlife
	Exchanging and sharing resources	Informal, arranged/ contracted	Long-term, frequent	Coordinators transport product from source to processing or holding location	Coordinators transport product from source to processing or holding location
	Stopping of mutual adversaries	Informal, arranged	Long-term, frequent	Facilitating coordination with corrupt officials or/and airport employees to hinder investigations	Facilitating coordination with corrupt officials or/and airport employees to hinder investigations
	Spreading and reproducing crimes	Informal, arranged/ contracted	Long-term, frequent	N/A	Collaborating to transport contraband across the borders
Trading	Exchanging and sharing resources	Informal, arranged/ contracted	Long-term, frequent	Coordinators are responsible for obtaining and trading products from hunters	N/A
	Stopping of mutual adversaries	Informal, arranged/ contracted	Long-term, frequent	Providing resources to traders to pay fines or bribe authorities	Protecting traders against interference by the government

we also encourage researchers to collect quantitative data, including market surveys that could be used to statistically assess the framework we present here. Finally, it is recommended that future studies should examine and compare the mutualistic relationships found within wildlife trafficking to other illicit markets.

This study contributes to the criminological study of environment crime by highlighting how historical and contemporary notions that wildlife trafficking is an example of transnational organized crime inadequately represents the context- and stage-specific nuances of this complex crime. Our findings illustrate the centrality of both embedded and informal relationships surrounding illegal wildlife offenders, organized crime actors, and other crime groups, officials, authorities, and militias. These findings not only have important implications for conservation science and policy, but also demonstrate the applicability and value of criminological research in the study of environment crime.

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