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Understanding the illegal trade of live wildlife species in Peru

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Abstract There is only scant empirical field research that explores the structures of the wildlife trade throughout the world. This study describes the processes that take place before, during and after wildlife is traded illegally in Peru through the words and experiences of the actors involved. This analysis utilizes formal interviews ($N=47$), observations and thick descriptions in order to contextualize the processes of catching, selling, buying and rescuing wild fauna. Wildlife trade across Peru is found to be opportunistic and informal. The actors involved in this commerce are best described as ordinary citizens looking to supplement their low incomes.

Keywords Wildlife trafficking · Conservation criminology · Field research

Introduction

Although a criminological viewpoint is often missing from discussions about wildlife trafficking (Warchol 2004; Schneider 2012; Boekhout van Solinge 2014), criminologists are beginning to explore these illicit acts. Some criminologists describe the challenges of park rangers in protecting wildlife (Moreto et al. 2015). Others detail the illegal commercialization of fish (Petrossian 2014) and birds (Pires and Clarke 2012). Nevertheless, firsthand descriptions of the drivers, motivations and processes of the wildlife crimes are direly needed (Schneider 2008). This field investigation describes the processes and the people involved in the live wildlife trade of Peru, one of the world's most mega-diverse nations (Rodríguez and Young 2000). The analysis of this investigation is divided into several parts. A literature review lists information about Peru, wildlife poaching nationally and internationally. The methodology section describes how data was collected and analyzed. The findings are divided into sections

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that describe the processes and opinions of hunters, middlepersons, market sellers, owners and wildlife rescue workers. This investigation answers three main questions. 1- What are the processes of the trade of live wild species across Peru and how are these processes organized? 2- Who are the actors that carry out these processes and what are their motivations? Lastly, 3- How do the social and economic processes of Peru explain why citizens partake in this illegal commerce? This article concludes with a short discussion and policy recommendations.

Utilization of biodiversity and poverty in Peru

The United Nation's Convention on Biological Diversity (2015) cites Peru as one of the most biodiverse nations on earth; it houses the world's largest number of fish species (more than 2000) and is ranked second in bird species (1,736). However, many of the world's poorest citizens live in biodiversity "hotspots" (McNeely and Scherr 2001). On average, 23.9 % of Peru's population lives under conditions of poverty. In the Peruvian coast poverty is estimated at 15.7 %, in the rainforest 31.2 % and in the highlands 34.7 % (INEI 2015). The majority of Peru's biodiversity is found in the rural areas of the rainforest and highlands, wherein poverty is estimated at 42.6 and 52.8 % respectively (INEI 2015). In other words, the biodiversity hotspots of Peru are home to some of the nation's poorest residents.

Subsistence hunting of wildlife in Peru

Wildlife is an important source of subsistence for many citizens of the Peruvian Amazon (Redford 1992; Perez and Ojasti 1996; Alvard et al. 1997; Bodmer et al. 2004). A rich body of research on hunting customs, the economic values of wild meats, and hunting rates highlights the importance of wildlife for the survival of residents of Peru's rainforest (Pierret and Dourojeanni 1967; Alvard et al. 1997; Bodmer et al. 1997; Puertas et al. 2000; Aquino and Calle 2003; Naughton-Treves et al. 2005; Escobedo et al. 2006; Aquino et al. 2007; Saldaña and Saldaña 2011). Hunting for sustenance is legal so long as one animal is caught or its pieces weigh no more 50 kg (Espinosa 2008).

The commercialization of wildlife products is a wage earning option for the residents of Amazonia due to the low wages earned from agricultural products and limited labor opportunities (Claggett 1998; Espinosa 2008). However, hunting pressures are not equally distributed across the Peruvian Amazon. Through the surveying of Peruvian hunters, middlepersons and market sellers who commercialize in wild meats, Bodmer and Pezo Lozano (2001) discovered that the wild meats commerce happened mostly in small, rural Amazonian towns. In fact, changing unsustainable hunting practices to sustainable practices would decrease the earnings of rural jungle communities far more than those in large, urban rainforest communities (Bodmer and Pezo Lozano 2001). Bodmer et al. (2004) found that prohibiting the sale of illegal wild meats in the largest urban market in Iquitos (the largest city of the Peruvian rainforest) would only reduce 6.5 % of the wild meats harvest of the entire region of Loreto. This indicates that wildlife use and commerce in small, rural communities of the Peruvian rainforest affect hunting pressures more than commerce in densely populated urban rainforest cities (Bodmer and Pezo Lozano 2001; Bodmer et al. 2004).

Residents who hunt for profit must get licenses, respect quotas and refrain from selling their harvests in towns of 3000 or more residents (Espinosa 2008). Species that

are prohibited from extraction are listed on Supreme Decree 034-2004-AG (Doan 2011). Nonetheless, the survival of wildlife species is threatened by lax government regulations in commercial hunting and high extraction rates (Perez and Ojasti 1996). Overhunting is a threat to biodiversity in various ways (Redford 1992); it is linked to a decrease in "prey" animals (Paviolo et al. 2008) and the dispersal of plant seeds (Wright et al. 2000). Otherwise stated, unsustainable hunting practices may endanger the survival of wildlife species and entire ecosystems. The loss of biodiversity also threatens the survival of some of Peru's poorest citizens (Ortiz van Halle 2002).

Commercialization of live wildlife in Peru

Although wild animals across the Peru are primarily commercialized for subsistence (Redford 1992; Bodmer and Pezo Lozano 2001; Bodmer et al. 2004); they are also sold as pets (González 2003; Aquino et al. 2007; Gastañaga et al. 2011; Shanee 2012; Quevans et al. 2013), and for biomedical research (Redford and Robinson 1991; Maldonado Rodríguez 2011). Animal parts are sold as jewelry, souvenirs and for medicinal purposes (Redford and Robinson 1991; Bodmer and Pezo Lozano 2001; Laso 2009; Figueroa 2014). More than 40 years ago, Dourojeanni (1974) reported that 130 live species were exported out of Iquitos annually. In the Belen market (near Iquitos), Paredes and Mejia (2010) found 157 animal products for sale. Although most of these products were for sustenance, live species such as parrots, monkeys, sloths, owls, agoutis, caimans, and tortoises were also commercialized as pets (Paredes and Mejia 2010). Likewise, Shanee's (2012) exploration of Peru's wildlife trade found 2,643 animals in 722 encounters across the provinces of Amazonas and San Martin. Many of these species were found in market stalls, recreation centers, hotels and restaurants (Shanee 2012). Maldonado Rodriguez' (2011) investigation described the processes of hunting and delivering nocturnal monkeys for biomedical research across Peru, Colombia and Brazil. Through the accounts of 43 active hunters/traffickers we learned that from 2007 to 2008 approximately 4,000 primates were trafficked for malaria research into Colombia (Maldonado Rodríguez 2011). Figueroa's (2014) investigation into the commerce of Andean bears described how some cubs are traded as pets across the rainforest and highlands. Many bears are sacrificed once they become a nuisance; their body parts are utilized for medicinal purposes (Figueroa 2014). Quevan's et al. (2013) review of impounded wildlife in Lima found that 81,564 animal products and 17,932 live animals were confiscated from 2000 to 2007. The majority of the live species were birds (47.8 %), followed by amphibians (34.1 %) (Quevans et al. 2013).

Researchers have placed special attention to the trafficking of Peruvian birds across national and international markets. González' (2003) exploration of the bird trade in Peru's northeastern Amazon found 1,718 poached nestlings of 7 different species in a 4 year period. The majority of these birds were sold in local markets across Iquitos and Pucallpa, although a few species were brought to Lima (González 2003). Traffickers revealed that they turned to nestling due to a shortage of fish in the area (González 2003). Gastañaga's et al. (2011) year-long study of the parrot trade across 20 wildlife markets in Peru found 4,722 parrots belonging to 34 different species. In response to Herrera and Henessy's (2007) claims that Peru is a hub for international bird trafficking (based on their investigation of Bolivia's bird trade); Gastañaga et al. (2011) found no evidence of the international bird trade across the 20 markets. Pires' (2014) analysis of

open-air bird markets across Peru found that demand for birds was strongly linked to the nation's trade. Similar explorations in Mexico (Pires and Clarke 2012) and Bolivia (Pires and Clarke 2010; Pires and Petrossian 2015) found the bird trade to be opportunistic, rather than well organized. Most recently, Daut et al. (2015a) explored the relationship between international export quotas and national bird markets across Peru. Across 40 markets, 35,279 individual birds belonging to 130 native species were traded from 2007 to 2011. Although Peru's quota system allows for the international trade of some species, this did not facilitate the illegal trade of birds locally (Daut et al. 2015a, b). Local authorities confiscated illegal and legal bird species all the same. Customs in hunting and keeping birds as pets drive Peru's local bird market (Daut et al. 2015a).

This short review of the uses and commercialization of wildlife in Peru describes several important facts. While live animal trade is reported across Peru (Laso 2009; Gastañaga et al. 2011; Shanee 2012; Daut et al. 2015a, b), it is a small fraction of the wildlife trade in comparison to the commerce of wild meats (Claggett 1998; Bodmer and Pezo Lozano 2001). Wildlife is mostly commercialized for subsistence, and this happens primarily in small and rural communities (Bodmer and Pezo Lozano 2001). Nevertheless, wild species including birds (Gastañaga et al. 2011), mammals (Figueroa 2014) and reptiles (Quevans et al. 2013) are sold and kept as pets across the nation. Although Peru allows for the trade of some wildlife species as pets (through quotas regulated by the Ministry of Agriculture), these quotas are rarely reinforced (Daut et al. 2015a, b). In any event, many wild pet species are endangered (Paredes and Mejia 2010; Shanee 2012), which makes harvesting them illegal.

Wildlife trafficking internationally

Reviewing all of the components of wildlife trafficking across the globe is outside the scope of this article. Even so, a few concepts are widely cited in the literature on this topic. Wildlife trafficking (including live animals, wild meats and animal parts) is cited as a multi-billion dollar criminal industry (Lee 1995; Kazmar 2000; Rosen and Smith 2010; Elliott 2012; IFAW 2013; Lawson and Vines 2014; Sollund and Maher 2015), only second to drug trafficking (Zimmerman 2003; McMurray 2009). Estimations of illegal wildlife trade values are compiled through declared values of species at customs, rather than their market value or prices according to the Convention on International Trade in Endangered Species of Wild Fauna and Flora or CITES (South and Wyatt 2011). However, this is a hidden practice and estimating its monetary value is difficult, if not impossible (Traffic 2008; Schneider 2012; Wyatt 2013).

A diverse number of actors are involved in the trade of wildlife. For example, Warchol (2004) notes that ordinary residents, zoo owners, tourists, animal collectors and famers across socioeconomic backgrounds trade in illegal flora and fauna products in South Africa and Namibia. This global trade includes a variety of actors with a range of motivations (subsistence, enjoyment or profit) (Warchol 2004; South and Wyatt 2011; Lawson and Vines 2014). Therefore, it is difficult to create interventions that address all of the drivers behind this commerce (Traffic 2008).

Many researchers indicate that the global trade of wildlife is comprised of highly systematic processes which are facilitated by organized crime groups (Zimmerman 2003; Wyler and Sheikh 2008; Elliot 2012; Ayling 2012; IFAW 2013). As noted by

Wyler and Sheikh (2008), "anecdotal evidence indicates that suppliers have historically tended to work in small but well-organized groups" [9]. Likewise, Elliott (2012) explains that only a small section of this trade is informal or opportunistic; instead it is mostly "systematic, well-financed and highly organized" [2]. Organized crime groups allegedly prefer this trade due to the high demand for wildlife products, massive earnings and low risks (Elliott 2012; IFAW 2013; Wyler and Sheikh 2013; Telesetsky 2014). Some researchers also link the wildlife trade to drug trafficking, human trafficking (Wyatt 2013; Zimmerman 2003), and terrorist groups (Wyler and Sheikh 2008; IFAW 2013; Lin 2005). Criminal groups allegedly gain power through violence and corruption due to their earnings from the wildlife trade (Zimmerman 2003; Lawson and Vines 2014).

Although Wyatt (2013) concludes that connections between drug trafficking and wildlife trade are clear (due to reports of confiscations of wildlife species and parts along with drugs), she recognizes that we do not know the extent of these connections. Schneider (2008) also remarks that research on illegal wildlife trade is "insufficient in both quantity and quality" [275]. Much of the information about the wildlife trade comes from secondary sources of information, the World Wildlife Fund and Traffic; however these studies do not provide careful descriptions of methodologies and how conclusions were reached (Schneider 2012). According to Traffic (2008), studies and reports based on wildlife NGOs and expert/stakeholder's interviews may be biased, lack scientific methodologies or fail to include first-hand accounts of the trafficking processes. The relationship between the wildlife trade and organized crime groups is therefore said to be largely speculative and based on anecdotal evidence (Schneider 2012). Investigative field work is necessary in order to uncover the general characteristics of this trade (Schneider 2008) and its organization (Lawson and Vines 2014; Sollund and Maher 2015). In-depth interviews with the persons who commercialize in illicit wildlife would help us uncover its processes and motivations (Schneider 2008). The present study adds to our limited knowledge of this trade by focusing on Peru's live wildlife commerce.

Methodology

Although fieldwork and interviews of persons involved in this illegal trade can be dangerous and difficult to conduct (Traffic 2008; Wyatt 2009), this is key method employed in this investigation. In order to understand the processes of the live wildlife commerce of Peru I interviewed persons who commercialize in live fauna; took detailed observations across ports, markets, streets and jungles; spent time with informants while they participated in the trade; and photographed species being traded across 20 cities of the coasts, highlands and rainforest of Peru. Data collection began in 2012 and continued through 2015. Forty-seven formal interviews ($N=47$) comprise the main narratives in the study. Informal conversations with dozens of citizens who participate in the trade and literature on this topic help to triangulate the study's findings.

Locating markets

Locating study sites employed a variety of methods. Upon arriving to main cities across Peru I asked cab drivers, street vendors and local residents where to find fauna (domestic and wild) for sale. Oftentimes, the information provided by residents was

outdated; this resulted in visiting markets where fauna was sold in the past. Whenever I encountered a dead end, I moved onto the residents' next suggestion. I also visited every popular market and sales district across the 20 cities (an average of 4 to 8 locations per city) in search for commercialized live fauna.

One of the most difficult aspects of this investigation was reaching the study sites. Peru is home to 28 out 32 world climates. While this unique characteristic is responsible for the nation's biodiversity, travelling through some of the nation's landscapes is time consuming and physically strenuous. In order to reach the markets where fauna is sold; towns where hunters and middlepersons live; and the rescue centers for confiscated species I utilized various transportation methods (often within the same day). Main cities were reached by commercial flights and busses. I rented moto-taxis, motorcycles, cars, speedboats and canoes to reach the destinations suggested by informants. At times, walking and travelling for hours was the only way to reach a suggested location. A great hurdle in this investigation came from following leads given by informants (occasionally for days) without any results.

Recruiting subjects

Whenever I came across fauna sellers I invited them to participate in the study. Unsurprisingly, the majority of sellers refused participation (approximately 1 out of every 10 sellers agreed to a formal interview). A few subjects asked to be interviewed away from their stands, customers and other sellers. Interviews took place in a variety of settings including residences, markets, plazas, ports, forests and moving boats; they lasted anywhere from 5 to 45 min. Subjects were asked how they became involved in this commerce and to describe its processes. Interviews were conversational and mostly unstructured. Notes were recorded on a small pad while I interviewed the subjects.

With the help of the market sellers I employed a "snowball sampling" technique (Goodman 1961); useful for the recruitment of "hidden" populations. This method resulted in the recruitment of hunters and middlepersons who commercialize in endangered fauna discreetly (outside of the open-air markets). A few hunters and middlepersons also became informants and allowed me to photograph requests of endangered fauna as they were being delivered. At the suggestion of informants, the study was amended to pay subjects 10 soles (in 2015 rates $3.09). Payment indicated to subjects this study was not a law enforcement initiative.

All study procedures were approved by Rutgers University's Internal Review Board. Study procedures were described to all subjects prior to participation with an oral consent script. Subjects consented verbally after being read their rights as participants. No deception was employed in the study, all interviewees were aware of the purpose of the investigation. In order to protect the subject's confidentiality, I connect the subjects to the main regions of Peru (for example: a market seller from the northern coast). Several actors agreed to participate due to the procedures in place to protect their identities.

Observations of the trade

Lengthy observations (Spradley 1980) on the wildlife trade processes were made across ports, markets and streets. Sellers and middlepersons also made several suggestions of places I should observe (Spradley 1980); ports were included due to their suggestions. My role as a researcher was that of a "passive" observer (Spradley 1980), a "bystander"

or "spectator" who does not engage in the trade. A few informants invited me into their homes to view and photograph endangered fauna too unusual (and dangerous) for the markets. Middlepersons also invited me to tag along with them as they looked for fauna to buy and re-sell across ports. Several market sellers allowed me to observe them while they haggled with customers and to photograph the species they were selling. Openness about the purpose of the study allowed me to gain trust and access to places and situations that would otherwise be hidden to the general public. Descriptions of the observations were recorded after the observations ended.

Data analysis

Interviews and observations were transcribed and analyzed with a grounded theory approach (Glaser and Strauss 1967), wherein findings informed the conclusions of this analysis (rather than testing formulated theories). No preparatory research (Glaser and Strauss 1967) on the subject took place. I entered the field without knowledge of concepts in conservation or wildlife trafficking in order to avoid NGO and academic biases on this topic. In addition to quotes from interviewees, the study utilizes "thick descriptions" (Geertz 1973) or detailed explanations of events in to contextualize the study's findings. The actors were divided into several categories based on their participation in this commerce. This analysis describes the actions, experiences and opinions of live wildlife "hunters" ($N=4$), "middlepersons" ($N=9$), "sellers" ($N=12$), "rescue workers" ($N=18$) and "owners" ($N=4$) across Peru.

Hunting for products

A small wooden boat is carrying a shipment of bananas into the port of a picturesque rainforest city at 5 in the morning. As the farmer unloads the fruit, his family sits quietly in the back of the boat. A fauna wholesale trader/middleman enthusiastically turns to me and says, "Let's see what else they got…" He climbs inside the boat and speaks with the farmer's wife; she then pulls out a burlap sack. He opens the sack and grabs a yellow-footed tortuous; he inspects it carefully and returns it to woman. I asked him why he did not take it and he responds, "It was too small, I could not sell it for much… let's see what else they brought." He then climbs onto the next produce boat and then onto another boat…

While most of the hunting in the Peruvian Amazon is for sustenance (Redford 1992), opportunity plays a big role in the hunting process (Redford and Robinson 1987) and the trading of live fauna (Shanee 2012; Pires and Clarke 2010, 2012). Many hunters who trade with fauna do not specialize in hunting or commercialize in fauna on full time basis (Maldonado Rodríguez 2011). Instead, many species are caught opportunistically (Claggett 1998; Saldaña and Saldaña 2011), and if a resident sees a chance to make some extra money they take the animals to the ports and markets in order to find a motivated buyer.

Opportunity and the hunter

The residents of the jungles do not need calendars in order to plan their expeditions; many find opportunities for hunting due to the sounds of the forest (Claggett 1998). As a hunter notes, once you hear the cries of new born, "you will know when it is the best time (to catch

them).” If birds or monkeys are killed for subsistence, their offspring (too small to eat) may be commercialized as wild pets (Leberatto 2016). Animals are also caught by chance when the focus was a different species. As a hunter from the Amazon basin notes, “Boas get caught when fishermen fish for paiche (arapaima).” Snakes and other species trapped in fishing nets are also transported to the ports and sold along with other agricultural products.

Although the majority of residents in the rural rainforest only hunt occasionally (Saldaña and Saldaña 2011); the farmers or *campesinos* of Peru also hunt due to conflicts with ocelots, hawks, jaguars, caimans and pumas (Gaviria Guedes 1981; Naughton-Treves 2002; Treves and Karanth 2003; Shanee 2012). Hunting predators that threaten local farmers’ crops and livestock is known as sanitary hunting (*caceria sanitaria*) or “cleaning the forest” (Naughton-Treves 2002). Farmers’ whose livelihoods depend on agricultural products may suffer great economic losses due conflicts with wild fauna (Michalski et al. 2006; Rai et al. 2012). In the highlands, the endemic condor is also hunted for the protection of livestock. As a rescue center worker of the highlands explains, “They (farmers) kill them (condors) because they at times kill their cattle.” The feathers of the condors are then sold to shamans (Williams et al. 2011; Figueroa et al. 2013). The rescue worker adds, “To the Incas the condors were sacred and the shamans buy the feathers to do their rituals, one feather costs about 100 soles.”

The opportunistic hunting and trading of species is also connected to (formal and informal) logging and mining. Loggers and miners depend on wild fauna for sustenance in the areas where they operate (Castro et al. 1976; Robinson et al. 1999; Hill 2002; Ortiz von Halle 2002; Fagan and Shoobridge 2005; Boekhout van Solinge 2008). The opening of roads due to these operations also facilitates the wildlife commerce (Traffic 2008; Robinson et al. 1999; Boekhout van Solinge 2007). When laborers hunt an animal, they can use the mother for subsistence and sell its offspring. According to informants, some loggers hide animals in their trucks and transport them to Peru’s main cities; live wildlife also travel by boats to various Amazonian cities (González 2003).

These are a few instances in which hunters, farmers and laborers of the highlands and forests of Peru decide to make a profit from chance encounters with fauna. A common image across the ports of the Peruvian rainforest is seeing agricultural farmers trying to sell off a single monkey or turtle. Although most of these transactions are opportunistic; residents and tourists also make special requests for fauna. These requests are sometimes facilitated by middlepersons.

Middlepersons and the search for fauna

A middleman knocks on the door of a small rainforest home with a delivery on hand. The middleman who brought me to this home opens the bag and pull out an infant brown-woolly monkey, “Antony, take a look.” The primate struggles to open its eyes due to the brightness of the room and clings on to the man’s arm, “See? This is how they bring them from the river and then they get delivered to the buyers.” Both men nod in agreement. The other man returns the primate into the bag, waves goodbye and sets off to deliver the primate.

Although some of the middlepersons interviewed for this study have been involved in the wildlife trade for years, they are far from experts in this commerce. Not unlike wildlife hunters (Maldonado Rodríguez 2011; Pires and Clarke 2012), middlepersons

are better characterized as ordinary citizens who take an opportunity to make some extra cash with an odd-job. The middlepersons interviewed for this study make a living through regular, low-paying jobs as laborers, farmers, street vendors or produce sellers. Much like the selling of live species in ports by agricultural workers; working as a wildlife middleperson in Peru happens on rare occasions.

Requests to middlepersons: "I will see how I find it"

Middlepersons perform various functions in the live wildlife commerce of Peru. They help buyers and sellers hunt and transport fauna species (González 2003; Maldonado Rodríguez 2011). Some individuals also purchase live species or wild meats to re-sell to market sellers or residents (Castro et al. 1976; Bodmer et al. 2004). The middlepersons interviewed for this study also participate in this trade when a seller, scientist, resident or tourist makes a request related to the fauna or flora of Peru. Residents trying to get rid of a species (a former pet or current predator) may contact middlepersons to help them locate a buyer (Leberatto 2016). Biomedical researchers may contact hunters across Amazonian communities to request for the capture *and* transport of species (Maldonado Rodríguez 2011). Bird exporters may contact hunters (Daut et al. 2015a) or middlepersons to find species.

Middlepersons across Peru also cater to tourists' requests (Leberatto 2016). Eco-tourists travel to biodiverse nations in order to interact with fauna. These interactions range from feeding species (Orams 2002); to viewing them in restaurants and lodges (Shanee 2012); or hunting them for entertainment (Groom et al. 1991). A middleperson in the Amazon basin explains how he works with tourists, "I take tourists to places where they can catch or buy the animals, or to people who can do it for them." Another middleperson expressed a similar sentiment:

> Some (tourists) may be looking to trap or hunt an animal, while others are biologists or students looking to study the plants and trees of the area so we help them. Lately they have been looking for insects a lot… and rare fish.

Middlepersons across Peru engage in processes that may help or harm biodiversity. Rather than systematic processes to trade fauna (Elliott 2012); the processes carried out by middlepersons in Peru are opportunistic and informal. Middlepersons must also ask their friends and acquaintances to help them fulfill wildlife requests. A common saying among middlepersons is "Whatever you are looking for, we can find it." Upon inquiring *how* they can "find it" many affirmed, "Well… I will see how I find it." Middlepersons must sell their abilities in order to be hired by residents, tourists, scientist, buyers or sellers; if *or* how they can fulfill requests is a different matter. Likewise, some "hunters" may not be experts in hunting but upon coming across an opportunity to make some extra cash they will "figure out how they find it."

Market sellers of endangered fauna across Peru

At a busy market in the northern coast of Peru, a market seller is meticulously arranging her cages of rabbits, puppies and wild parrots. She turns to me to explain how her philosophy in selling fauna differs from the other sellers across the market:

> In other stands, *I don't know if you have seen them*, they are not clean and do not have the animals well cared for. I do not like to see them that way. I like for animals to be well cared for, I like animals personally…

She then lists how she maintains her pet stand: the way she cleans and arrangers her cages; how often to replace the water and food; and how to instruct customers on the animals' care. Most importantly, she highlights that the animals must be in good conditions otherwise they will not sell. While she is meticulous with the care of her animals, she was correct in criticizing the poor conditions of other wild pet stands. Several market stands had fauna cramped into small and dirty cages; some species appeared sickly and underfed.

Although market sellers openly commercialize in illegal fauna across Peru (Dourojeanni 1974; Redford and Robinson 1991; González 2003; Paredes and Mejia 2010; Gastañaga et al. 2011; Quevans et al. 2013; Daut et al. 2015a, b; Figueroa 2014), the current wildlife market does not compare to the commerce of years past (Shanee 2012). Today, there are fewer fauna species sold in markets (Shanee 2012), and fewer wildlife sellers. Much like hunters (Maldonado Rodriguez 2011; Pires and Clarke 2010; Shanee 2012) and middlepersons; the majority market sellers interviewed in this study sell live fauna opportunistically to supplement their low wages.

Finding merchandize

Peruvian market sellers of live wild fauna find their merchandize in a variety of ways. For example, a produce seller from the cloudy rainforest noted that she only sells live tortoises for consumption "every so often." She purchases tortoises whenever a farmer stops by her produce stand and offers her a good deal. The sale of live tortoises for sustenance is customary across Peruvian rainforest cities (Laso 2009). It is common to see produce sellers selling off a single tortoise, monkey or bird across some markets of the rainforest of Peru. However, this particular seller refuses to sell birds or monkeys because she "feels bad for them."

Some market sellers commercialize in both domestic and wild animals as pets. A seller from the northern coast of Peru notes that cats and dogs are more popular than wild species, nevertheless she will purchase parrots from hunters if they offer her a good deal. This seller is not bound to wildlife products and she changes her merchandize often. She explains, "I only sell them (animals) for seasons, sometimes I sell other things, I sell clothes or I will also sell toys." For these two sellers, the commerce of live wild species is an opportunistic and supplementary wage earning method (Claggett 1998; Pires and Clarke 2010; Maldonado Rodríguez 2011).

Only a few Peruvian market sellers make a living exclusively from the commercialization of wild pets. These sellers make greater efforts to find their products. As described by a seller from the rainforest who makes a living from selling live wildlife species, "You go into the ports and then buy them (the animals), every day I go to the port in the morning and in the afternoon and if something is convenient then I buy it." Some sellers also work with famers and hunters who find fauna opportunistically (Shanee 2012; Pires and Clarke 2010, 2012; Daut et al. 2015a). The seller from a rainforest explains:

> The hunters have people who they always sell to. A difference of 10 or 20 cents more, or a sol ($0.33) more and they choose who to sell to and work with you…

the people come from the river (rainforest) and know that they (animals) are purchased in the market, "there is that place where they will buy it…"

As he explains, a crucial transaction between market sellers and hunters of illicit wildlife in Peru hinges on a few cents. However, as a seller remarks, earnings in this trade have greatly diminished, "In earlier times at the markets you would find many more (animals), there were earnings, now you can earn about 30 soles ($9.00) daily, just enough to buy food… you only earn enough for basic necessities." On some days the sellers "do not make anything." Whenever sellers cannot find motivated buyers, they sell off the animals at a price below their initial investment. Wildlife traders note that their earnings from this commerce barely covers the cost of basic necessities (Maldonado Rodriguez 2011).

Market sellers also find merchandize through their previous customers. As a seller in a small coastal city notes, "People who no longer want their pets come to sell them to me because they can no longer take care of them." It is not uncommon for wildlife owners to become overwhelmed with their wild pets; this may result in the sale of the pet or giving it away (Laufer 2010). In other words, pet owners who create the demand for wild pets may end up supplying wild pet market sellers with merchandize. The ways in which market sellers acquire live species (through opportunistic hunters and pet owners) exemplify this trade's informal and unorganized nature.

Wild pet ownership in Peru

On a dirt road of a sleepy town in the mountains of the cloudy rainforest a woman is carrying a brown woolly monkey as she greets her neighbors. The monkey leaps from her shoulder and onto a papaya tree. I look at the woman and comment:

I thought you were selling the monkey and it got away.

Oh no! That's my monkey. He is just playing in the tree.

Do you own a lot of animals?

Yeah all kinds! Would you like to see?

As we enter her property, she calls each of her parrots and monkeys by name and they begin to approach her. She never dreamt of owning wild animals, instead she became a wild pet owner by rescuing them from a neighbor. Years ago, she saw how her neighbor mistreated and abused her wild pets. Angered and saddened by the situation, she pleaded with her neighbor to free the animals and offered to purchase them. Eventually, she threatened her neighbor. She explains, "I told her, 'you are punishing and hurting them, what if I report you … I know that they will come and sanction you.'" The neighbor agreed to sell the animals and gifted her two species.

The citizens of Peru have long and important relationship with wildlife. The temples, jewelry, textiles and vases of the Caral (3000–1800 BC), Cupisnique (1500–1000 BC), Chavin (1200–200 BC), Paracas (800 BC - 200 AD), Moche (100–700 AD) and Chimu (1100–1470 AD) civilizations depict wildlife images. The Nazca's (100 BC - 800 AD)

"Nazca Lines" depict images of fauna 100's of feet long in the deserts of the coast. Cusco, the capital of the Inca Empire (1438–1533 AD), was built in the shape of a puma. The Incas also maintained zoos with wildlife from all regions of the continent (Lathrap 1973; Redford and Robinson 1991). Ordinary Peruvian citizens continue to keep birds, reptiles and/or mammals as pets (Douojeanni 1974; Shanee 2012). Some pet owners enjoy the company of parrots due to their vibrant colors, ability to sing and talk (Douojeanni 1974; Redford and Robinson 1991). According to market sellers interviewed in this study, primates are very popular among children. Parents may indulge their children and family with a pet monkey (Ceballos-Mago and Chivers 2010; Duarte-Quiroga and Estrada 2003). Primates are also chosen due to their similarities with humans (Cormier 2002; Hill 2002; Laufer 2010). Teens and young adults looking for an unusual pet may opt for a snake (Laufer 2010). Many wild pets are received as gifts (Ceballos-Mago and Chivers 2010; Duarte-Quiroga and Estrada 2003). The four owners interviewed in this study have received wild pets as gifts from the pet's original owner; two have never purchased a wild species.

A part of the family: caring for wild species

Although some owners attempt to re-sell their wild pets; a few citizens collect as many wild pets as possible. Since the rescue of her first pets a decade ago, this owner has purchased close to 50 wild pets. Currently she owns 9 wild pets that cohabit with household pets and farm animals. Some of her wild pets died from old age, others have run away, and a few were stolen by neighbors. Wild pets are often very young when they are captured and sold; many do not survive for very long in captivity (Duarte-Quiroga and Estrada 2003; Weston and Menon 2009; Ceballos-Mago and Chivers 2010; Shanee 2012; Natusch and Lyons 2012). In addition to being entertained by wild pets (Dourojeanni 1974), many owners also see them as a part of their families (Cormier 2002; Duarte-Quiroga and Estrada 2003; Laufer 2010). She explains:

> I try to give warmth and love to all of my animals and I worry about what would happen in the event that something happened to me… who is going to treat them in the same way that I do…

Like many owners of wild fauna in Peru, this owner purchased most of her wild pets illegally in ports and markets. Unlike many wild pet owners, she files paper work to become their legal owner with INRENA (National Institute of Natural Resources). Animals are fed three times a day. Much like the diets of other wild pets (Duarte-Quiroga and Estrada 2003; Weston and Menon 2009; Ceballos-Mago and Chivers 2010), her pets' diets consist of fruits and prepared foods that she and her family eat. It is nearly impossible to replicate the dietary needs of wild species (Weston and Menon 2009); inadequate diets often result in ailments for wild pets (Duarte-Quiroga and Estrada 2003; Ceballos-Mago and Chivers 2010; Hess 2011). A vet comes to her house every 3 months to monitor the pets' progress.

Although this owner buys wild pets (and thereby creates a demand for their commercialization), she disassociates herself from other buyers and sellers of wild fauna:

> I do not sell them. Here is where their lives are settled… I do not traffic them like the people here in the markets, where the animals go from one person to another to another, in those transactions the animals suffer.

An important motivation for her ownership of wild fauna is her fear of the animals' suffering through various human transactions or that they may end up with an abusive owner. Some owners of wild pets feel that they are rescuing fauna and caring for species that would otherwise perish (Duarte-Quiroga and Estrada 2003; Ceballos-Mago and Chivers 2010; Laufer 2010; Hess 2011). However, her greatest motivation is that they bring her joy (Laufer 2010). She explains, "They fill my heart, they fill me with joy." Her dream is to have many more animals and to build a small zoo where her friends and neighbors can learn about wild species:

> I want to make like a lodge, like a small zoo… It is already in my mind what type of animals I will have… in my farm I have a large area where there will be cages for people to come and see them free of charge.

Her dreams are not far from a plausible reality in Peru. Several citizens across the country shared her ambitions and opened their own private zoos and lodges that house illegally purchased fauna (Shanee 2012). As an example of informal processes across Peru, many of these private zoos and lodges are utilized by wildlife authorities to house confiscated species.

What happens to confiscated fauna?

At a rescue center high on top of the Andes, a blue-yellow macaw is shielding its eyes from the beaming midday sun. Its torso is nearly featherless and its damaged skin is visible. One of the center's workers explains:

> When they are stressed out they pluck out their feathers, when they are depressed or sad… He is doing a lot better now; when he came in he was in really bad shape. The owners did not know what was wrong with him so they brought him here. Now he is a lot happier, his feathers are growing…

Birds may pluck their feathers due to loneliness, stress or poor socialization (steaming from isolation from parents) (Van Zeeland et al. 2009). Although the cold winds of the highlands are a big contrast from the warmth and humidity of the Amazon, this macaw appears to thrive. In this and various other rescue centers, nature lodges, restaurants and hotels, visitors can find confiscated species from every corner of Peru's territory.

Some may assume that once fauna is confiscated by wildlife authorities, plans for rehabilitation and reintroduction into the wild are set in motion. However, freeing confiscated fauna may cause great damage to wildlife populations due to the viruses and diseases the species may have acquired in captivity (Neri Godoy and Reiko Matushima 2010). Once fauna is rescued by Peruvian authorities they are likely to go through many more human transactions.

Coming to the rescue

According to middlepersons and rescue center workers, wildlife authorities have a very difficult time finding where to place confiscated species. While housing species in zoos and rescue centers may seem like the best option, there are many restrictions that limit a

facility's ability to house rescued animals (including quarantine spaces, vet services, and food) (Karesh 1995). Wildlife authorities are often left scrambling to find a zoo, rescue center, lodge or even a restaurant where to place confiscated species. As explained by a rescue center worker from the cloudy rainforest, "They (wildlife authorities) have to call and go around all the time, and then we have to call the other centers as well to figure out who can take what animal." Ironically, rescued animals are sometimes placed in lodges, hotels and restaurants that purchase illegal fauna for the enjoyment of tourists (Shanee 2012; Daut et al. 2015b). Another rescue worker from the highlands explains the ways animals enter his rescue center:

> There are 3 ways in which animals end up here: 1- The ecological police bring them. 2- The citizens call the authorities and they ask us to come and help remove the animal (that may threaten the community), we go with them and help to remove them. 3- Citizens find them; they call us and tell us that they have seen an animal…we also have macaws, condors, and jaguars that are confiscated from circuses.

Confiscation and chance encounters with fauna are not the only ways in which animals end up in rescue centers. A Peruvian biologist working in an Amazonian rescue center notes that many citizens also give up their pets, "We also have citizens who give up their animals voluntarily, persons who cannot take care of the animals that they have." Owners may take wild pets to these centers once they become aggressive or too expensive to maintain (Duarte-Quiroga and Estrada 2003; Laufer 2010). In contrast to the citizens who resell their wild pets to market sellers, many wild pet owners take them to rescue centers of Peru. Another rescue center owner describes how citizens encounter animals and bring them to her center, "Sometimes the car will run over an animal and the drivers bring them to us as they are in agonizing pain, so that they do not die." As noted by rescue center workers, some citizens make an effort to save animals they can no longer care for, if animals are hurt by accidents, or they find them by chance in their communities. Although some residents choose to make a profit out of animals they find opportunistically (Pires and Clarke 2010; Shanee 2012; Daut et al. 2015a, b), others bring the animals to rescue centers in order to protect them. In other words, citizens' chance encounters with wild species also create an opportunity to save wildlife from harm or the commercial trade.

Discussion: understanding the wildlife trade of Peru

This field investigation across 20 cities of the jungles, mountains and deserts of Peru describes several aspects of this nation's wildlife commerce. This study highlights various processes related to the trading of wildlife which include: 1- hunting or findings species; 2- transporting and delivering species to ports, markets and private residences; 3- acquiring species to sell in open air markets; 4- purchasing, owning and caring for species; and 5- finding where to place confiscated species. Rather than systematic or organized (Zimmerman 2003; Elliott 2012), the processes connected to the wildlife trade in Peru are better described as opportunistic and informal (Claggett 1998; Nooren and Claridge 2001; Saldaña and Saldaña 2011; Maldonado Rodríguez 2011; Pires and

Clarke 2012; Pires 2014; Shanee 2012; Daut et al. 2015a, b). The farmers, hunters or residents of the rainforest and highlands may come across wildlife species by chance and decide to trap or hunt them (Claggett 1998). After trapping species, residents may decide to use them for sustenance, sell them to middlepersons, market sellers or residents. The biggest opportunists in this commerce are the middlepersons who embrace random opportunities to profit from a range of requests related to the flora and fauna of Peru (Leberatto 2016). Some wild pet owners receive an animal as a gift; or purchase them in an attempt to rescue them (Duarte-Quiroga and Estrada 2003). Many confiscated species end up in rescue centers when a resident, wildlife authority, or center worker finds them by chance. Previous pet owners also bring wild pets to these centers (Laufer 2010). Much like the hunting, requesting, transporting, purchasing and rescuing of live wild fauna, finding a place to house confiscated species across Peru is opportunistic and informal.

This analysis describes the actors involved in these processes across Peru as ordinary citizens ranging from farmers and produce sellers, to laborers and tourists; as opposed to members of criminal organizations (Zimmerman 2003; Elliott 2012; Wyatt 2013). This finding mirrors the descriptions of actors involved in the wildlife commerce in studies by Nooren and Claridge (2001) in Laos; Warchol (2004) in South Africa and Namibia; Traffic (2008) across Cambodia, Indonesia, Lao PDR and Vietnam; Wyatt (2009) in Russia; Pires and Clarke in Bolivia (2010) and Mexico (2012); and Maldonado Rodríguez (2011) in Peru, Colombia and Brazil. Although Wyatt (2013) notes that "There are certainly people that poach out of poverty, but arguably this is a small portion of the illegal wildlife trade" [170]; this study finds that the actors who profit from this trade in Peru are incentivized by the opportunity to supplement their low incomes (Claggett 1998; Pires and Clarke 2010, 2012; Maldonado Rodríguez 2011). Those who own or purchase wildlife may be looking for companionship, feel that they are rescuing the species, or may have received them as a gift (Duarte-Quiroga and Estrada 2003). The demand for live wildlife pets in Peru is internal (Gastañaga et al. 2011; Pires 2014) and incentivized by the nation's history with wild pet ownership (Daut et al. 2015a, b).

Although much of this practice is illegal and citizens know that it is prohibited (Maldonado Rodríguez 2011), it may not be seen as "criminal" by many citizens due to the nation's lengthy history of utilizing wild fauna as pets (Lathrap 1973; Redford and Robinson 1991; Daut et al. 2015a, b), for subsistence (Redford and Robinson 1991), and for medicinal purposes (Figueroa 2014). Most of the markets where live wildlife and wildlife products are sold operate in plain view of citizens, visitors, law enforcement and government officials. According to some market sellers, law enforcement confiscate their wild species on one day and the next week they come to the market looking to purchase a parrot as a gift for a family member. The openness of markets and informality with which fauna is traded exemplify how the wildlife commerce is a customary part of Peruvian culture.

This investigation has several limitations. Its main limitation is the limited sample size. Sampling hidden and informal populations is complex. Because much of this trade is opportunistic and market sellers change their merchandize continuously, it is difficult to know how many sellers have sold live wildlife in the past or may consider this commerce in the future. Likewise, it is hard to know how many hunters and middlepersons participate or have participated in this commerce. Although markets

operate in plain view of citizens, species are at times confiscated by wildlife authorities (Daut et al. 2015a, b). Understandably, many sellers did not choose to participate in the study. Another limitation is that this study does not track wildlife species outside of Peru. However, most of the demand for Peru's wildlife is internal (Gastañaga et al. 2011; Pires 2014; Daut et al. 2015a, b) and exploring the internal processes can help us uncover the most immediate threats to Peru's biodiversity. Some scholars note that the national trade of wildlife involves ordinary citizens but once wildlife is trafficked abroad criminal organizations may potentially be involved (Warchol et al. 2003; Wyler and Sheikh 2008). While this investigation does not follow Peru's wildlife internationally, no firsthand evidence or accounts from the field indicate that criminal organizations were involved in this trade. Much of the literature on Peru's wildlife trade also finds this commerce is informal and opportunistic and make no mention of criminal organizations (Claggett 1998; Maldonado Rodríguez 2011; Pires and Clarke 2012; Pires 2014; Shanee 2012; Daut et al. 2015a, b). Perhaps, it is possible that exporters of wildlife transport species legally and are able to take advantage of Peru's "quota system" and lax legal processes that control the nation's international trade (Daut et al. 2015a, b).

"Not like before…"

The residents of biodiverse zones hugely depend on wildlife for survival (Ortiz von Halle 2002) and are invested in the wellbeing of wildlife population (Bodmer et al. 2004; Boekhout van Solinge 2010). Every person interviewed in this analysis is saddened by the decrease of wildlife and forests. Residents are aware of the decline of wildlife in their communities across the Peruvian Jungles (Claggett 1998; Laso 2009; Saldaña and Saldaña 2011). Many of the persons interviewed for this study also feel remorseful in their involvement in the trade. To the residents who have lived for generations in the forests of Peru, the loss of wildlife, lands, languages and customs are a cause of great sadness. An even more painful experience occurs when residents feel forced to sell off the little they have left in their communities in order to afford basic necessities (Maldonado Rodríguez 2011). The earnings from commercializing in fauna in Peru indicate that even at the random intervals when these transactions happen, very little is earned (Claggett 1998). Hunters, middlepersons, market sellers, and conservationists all agree that finding wildlife across Peruvian forests is "not like before."

For those who partake in selling of live wildlife, this is an almost extinct business. Many explain that 10 and 15 years ago markets across the country would be full of live wild animals up for sale. Today, this is a far less common occurrence (Shanee 2012). As a seller explains, "Animals used to sell really well but there aren't as many anymore, now they are much more expensive." Another market seller expresses a similar sentiment, "In earlier times at the markets you would find many more (animals), there were earnings." Hunters and sellers explain that there are fewer species in the jungles. However, a greater concern among citizens is that there are far fewer jungles and forests. As Shanee (2012) remarks, "the reduced numbers of wildlife animals for sale, especially in Amazonas, could suggest a decline in wild populations due to high deforestation levels in both regions and continuous hunting" [12]. Hunters noted that fauna used to live and thrive among them; and that hunting for subsistence or sale did not deplete the forests of species. Today, hunters must go farther and deeper into the

jungle in order to hunt and find species (Claggett 1998; Maldonado Rodríguez 2011; Saldaña and Saldaña 2011). Combinations of factors (i.e., agriculture, overhunting and logging) are most harmful to the conservation of biodiversity rather than just one factor (Laurance and Useche 2009). While the destruction of fauna habitats due to agriculture and overhunting are connected to declines of wildlife (Aquino and Calle 2003; Boekhout van Solinge 2010; Daut et al. 2015b); the continuous destruction of entire ecosystems due to lumbering and mining operations needs important considerations.

Understanding Peru's wildlife commerce in a sociopolitical context

Von Essen et al. (2014) note that criminological inquiries into wildlife crimes often do not consider the sociopolitical context of these acts. Scholars must attempt to see wildlife crimes as a result of overlapping issues in a cultural reality in order to understand why ordinary, law-abiding citizens break the law (Von Essen et al. 2014). This study notes that motivations to commercialize live fauna in Peru steam from the opportunity to supplement low profits (Maldonado Rodríguez 2011), local demand (Pires 2014) and history of wild pet keeping (Daut et al. 2015a, b). However, when we look at the sociopolitical context of "law breaking" among Peru's indigenous and rural populations we find a dark past. Hundreds of years of violence between ethnic groups and those with governmental power to formulate laws (Barnechea 2013) describe Peru's struggles in creating a national identity (Matos Mar 2012).

The Peruvian government has a long history of withholding rights from indigenous communities over their lands and resources (Poole 2012). While government formulated "special legal rights" for ethnic groups include the right of subsistence hunting (Espinosa 2008) and "local justice" (i.e., sentencing and punishing criminals) (Poole 2012); the struggle for rights over natural resources intersect with the nation's infamous history of private, military, political and governmental corruption (Quiroz 2013). Unsurprisingly, distrust of the government and law enforcement is prevalent across the nation (Costa and Romero 2010: Plöger 2006; Du Puit 1995; Mujica 2005). As Poole (2012) highlights, the government's overreaching powers often leads to an unequal recognition of the components that affect the quality of life of indigenous communities, and results in divergent valorizations of natural resources. For example, instructing ingenious communities to halt hunting in order to conserve biodiversity can create a great deal of unhappiness (Coria and Calfucura 2012). In fact, many residents feel forced to increase their poaching due to the assumption that subsistence hunting may end indefinitely (Bodmer et al. 2004). While many Amazonian communities carry out practices that protect biodiversity (Bodley 2013); the Peruvian government's creation of protected zones and restrictions on hunting (without consulting native communities) have resulted in violent confrontations and the deaths of conservationists (Puertas et al. 2000). Another notable ongoing struggle comes from the government's decision to extract natural gas through the "Camisea Gas Project" and build a highway in the world's most megadiverse place, Peru's Manu reserve (Hill 2015); resulting in violent protests. Parallel to the legal extraction of natural resources (by the government and international entities); wildlife trafficking, informal mining and illegal lumbering also harm biodiversity. These commercial processes raise several questions: Who has the right to utilize and dictate the allocation of the Peru's natural resources? The Peruvian government (with its lengthy history of corruption and policies that created

social inequality); or the residents of the Amazon (who may seek to protect *or* exploit natural resources)? In which way should the international community be involved (or excluded) from this discussion?

We may assume that it is difficult for many members of indigenous and rural communities to trust the government's impositions over their individual rights. Likewise, many of the hunters, middlepersons and market sellers endure conditions of poverty and are struggling to make ends meet. Many sellers interviewed in this investigation began working in markets as children and were unable to acquire a grade school education. Hunters note that they are unable to make a living with their agricultural products and middlepersons often jump from odd job to odd job in order to afford a living. Many of the actors interviewed for this investigation are unable to read or write which greatly limits their opportunities in finding work. Rural areas have limited wage earning opportunities available, thus citizens are incentivized to trade with fauna (Claggett 1998; Espinosa 2008). This helps us understand why some residents may exercise their "local justice" and choose to sell live "illegal" wildlife species rather than follow the government's impositions over their customs and natural resources. The overlap between legal and illegal practices, socio-economic circumstances and local customs creates a "vacuum" where ordinary persons engage in illegal processes (Boekhout van Solinge 2014).

As Durand (2007) may note, formal processes in Peru (i.e., government approved protection *or* utilization of natural resources) and the informal processes (illegal poaching, logging and mining) do not offer ordinary citizens equitable opportunities for advancement. This results in the convergence of three interconnected yet separate economies: formal, informal and criminal (Durand 2007). Informality is evident across most sectors of Peru's economy; the majority of Peruvians make a living in the informal sector and many are self-employed (Linares 2010). The poaching, commercialization and rescuing of endangered wildlife species across Peru are examples of these interconnected processes. The same informal middlepersons help residents, tourists and scientists perform legal acts (viewing animals in nature) and illegal acts (trading in endangered species). In Peru, tourism operators, conservationists, and native communities compete for the exploitation *or* conservation of the same natural resources (Naughton-Treves 2002; Coria and Calfucura 2012) with the government and international corporations. This competition is embedded within formal, informal, criminal, historical, social, cultural and economic processes.

Recommendations

Solutions for the conservation of biodiversity must address the social and economic factors that drive citizens to become involved in these processes (Traffic 2008). Not accounting for the opinions, customs and social realities of native communities may result in disastrous consequences for residents and the conservation of biodiversity (Puertas et al. 2000). It is extremely important that scholars, scientists, national and international policy makers make greater efforts to address the life experiences, histories, cultures and socioeconomic realities of the citizens across the world's biodiverse zones when explaining the wildlife commerce and making policy recommendations.

Upward advancement

All but two of the hunters, middle persons and sellers want to stop working in the wildlife trade. These persons want formal employment, steady incomes and a secure way to provide for their families. They dream of acquiring capital in order form proper businesses. Some would also like formal training to learn how to manage a business. The government and international entities should make greater efforts to educate citizens who labor in Peru's informal economies and help them form legal business ventures. This would not only address these citizens' hopes of formal employment but may also end their involvement in this and other informal economies. Market sellers who sell illicit wildlife go to work each day at about 4 am and do not leave their stands until 6 or 7 at night. There is a willing, capable and able workforce who is left scrambling for opportunities across Peru; their efforts would be better utilized in formal businesses that raise the nation's profile and their communities out of poverty.

A focus on the demand

Many wild pet owners are incapable of caring for their wild species (Laufer 2010); this leads them to sell their animals back to market sellers or to give them to rescue centers. Educational efforts should focus on informing citizens on the difficulties, dangers, and expenses of owning wildlife species (Daut et al. 2015a, b). The aim of these efforts would be to prevent the purchase of wild pets. Among those who own wild pets, efforts should be made to inform them of the resources available for them to give up in their animals. A plea to the citizen's conscience (who likely bought animals due to their love of wildlife) should be made by highlighting appropriate standards of living for wild species.

Many of the animals brought back to rescue centers are so accustomed to humans that they cannot be reintroduced into their natural habitat. Rescue centers should work with pet owners in finding ways to care for these animals; perhaps allowing former owners to visit the species in the centers and helping to pay for their expenses. Creating these partnerships would allow the centers to provide care for animals that need lifelong assistance and help owners understand what proper wildlife care entails. This partnership can have rippling effects. It may prevent pet owners from purchasing new species. Former owners can also inform local residents to bring their species into rescue centers and advise them against the purchase of wild pets.

Increase of field studies

Field research of illegal activities and black markets that focuses on the processes of illicit activities is physically, psychologically and emotionally demanding. This work is difficult and at times dangerous. However, we still have very limited firsthand knowledge on the social and financial drivers of the wildlife trade across the world (Traffic 2008). This methodology is perhaps the most useful tool for understanding the social complexities and realities of this commerce. By understanding the cultures of biodiverse areas and residents' views on this practice we can understand viewpoints that contradict international ideologies (Boekhout van Solinge 2014), and work towards the formulation of sustainable and culturally sensible solutions. Each nation has its own

reality in regards to the wildlife trade; these realities should be understood in their appropriate social contexts (Von Essen et al. 2014).

This article hopes to encourage multidisciplinary researchers to include qualitative methodologies and lessons from those who live in these cultural realities when undertaking conservation studies. Greater efforts should also be made by criminologists, conservationist and multidisciplinary researchers to understand how the destruction of forests and ecosystems due to local and international demand for the natural resources is related to the illicit and informal practices of citizens in biodiverse areas.

Conclusion

This analysis describes the opportunistic and informal processes of hunting, trading, selling, buying and rescuing wildlife across Peru. By training sellers in informal markets we can move away from the proliferation of black market economies. Educating consumers can begin to change attitudes towards wild pet ownership. Forging partnerships between former wild pet owners and rescue centers may also help to improve the quality of life for animals and help to decrease the demand of wildlife as pets. Importantly, scholars and activists must make an effort to describe the wildlife trade through the utilization of field research and firsthand accounts that are contextualized in the cultural reality of biodiverse areas. Describing the wildlife trade as monolith is a disservice to finding sustainable solutions for the conservation of biodiversity. The greatest disservice is in the erasure of ordinary citizens' whose realities of poverty, inequality and social exclusion are related to their involvement in this commerce. By understanding the local context of this trade, we can understand the conditions that created this commerce in Peru; a history of pet keeping, internal demand and opportunity to supplement low wages (Maldonado Rodríguez 2011; Daut et al. 2015a, b). By going past economic and cultural demands, we begin to acknowledge that citizens across Peru's biodiverse zones are some of the nation's poorest residents (INEI 2015); that many of these citizens have been historically marginalized and denied rights over their natural resources (Poole 2012) by the same government which allows for the large-scale destruction of biodiversity and ecosystems (Hill 2015). Protecting biodiversity will take much more than exploring the illegal wildlife trade, it requires conscientious national and international efforts to address the social and economic drivers that create illegal *and* legal processes harmful to biodiversity. Nonetheless, field research that explores these interconnected themes is an important step in understanding these processes.

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Compliance with ethical standards

Ethical approval All procedures performed in this study are in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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