Use of Dichotomous Ivory Stockpile Management Strategies by African Elephant Range States:
A Threat to Effectively Combatting the Illegal Ivory Trade

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Abstract

The growing illegal wildlife trade, including the illegal trade of elephant ivory, has damaging ecological, social, economic, political, and health impacts. The growing transnational illicit ivory trade is increasingly supplied with ivory from African elephant poaching and unsecure, poorly managed ivory stockpiles legally owned by African elephant range states. If unabated, the illegal ivory trade poses a serious threat to sustainable conservation, human security, and international development. My master thesis is focused on the management of ivory stockpiles in sub-Saharan Africa as one of the necessary actions to combat the illegal ivory trade. It is accepted by the international community that collective action through the use of united, cooperative strategies is the most effective approach for combatting the illicit trade of wildlife and their products. However, African elephant range states are currently using two opposing (dichotomous) ivory stockpile management strategies – ivory stockpile destruction and ivory stockpile sale. This dichotomy threatens the necessary collective action to most effectively combat the illegal ivory trade. This is further complicated by the international community contradictorily calling for use of both ivory stockpile management strategies and by the current research inconclusively determining which strategy is more effective. Therefore, my master thesis seeks to explore this dichotomy and, through inductive analysis of archival data, answer my research question: which elephant ivory stockpile management strategy used by African elephant range states correlates better with more effective combatting of the illegal ivory trade, operationalized as decreased behavioral intention to poach as well as decreased poaching behavior?

Keywords: Illegal (or illicit) ivory trade, ivory stockpile management, ivory stockpile destruction, ivory stockpile sale, African elephant range state, effective combatting, poaching
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CHAPTER 1: INTRODUCTION

The demand for wildlife and their products has existed throughout history and continues to thrive today fueling both a large legal wildlife trade as well as a growing illegal wildlife trade (Conrad, 2012; Haken, 2011; Lawson & Vines, 2014; Ratchford, Allgood, & Todd, 2013; UNEP, CITES, IUCN, & TRAFFIC, 2013; Wyler & Sheikh, 2013). Wildlife and their products are demanded globally for a wide variety of purposes (Felbab-Brown, 2011; Gao & Clark, 2014; Haken, 2011; Ratchford, Allgood, & Todd, 2013; UNEP et al., 2013). An unsustainably high demand for wildlife and their products prompted the necessitated Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES] (see section, Definition of Terms) (CITES, no date [n.d.]). The convention passed by the United Nations in 1975 monitors and regulates the international trade of wildlife and their products to protect species from overexploitation.

Despite the efforts of CITES, the illegal wildlife trade is one of the largest transnational illicit trades (see section, Definition of Terms) (Haken, 2011; Lawson & Vines, 2014; Ratchford, Allgood, & Todd, 2013). Furthermore, the illegal wildlife trade is extremely difficult to combat due to its high profit and low risk opportunities for perpetrators. This is further complicated by the treatment of the illegal wildlife trade, until very recently, as a low priority issue by the international community (see section, Definition of Terms) (Akella & Allan, 2012; Ratchford, Allgood, & Todd, 2013; Warchol, Zupan, & Clack, 2003; WWF & Dalberg, 2012). Combined, these barriers are fueling the continued growth of the illegal wildlife trade.

The illegal wildlife trade is a serious international development issue due to its negative global implications and must be addressed. Research has shown that the illicit trade of endangered wildlife and their products not only overexploits these species threatening their
continued existence in the wild, but, equally alarming, it also directly threatens human well-being around the world (Nellemann et al., 2014; Ratchford, Allgood, & Todd, 2013; Wyler and Sheikh, 2008; Wyler & Sheikh, 2013). The devastating global implications of the illegal wildlife trade include: (a) threatening the environment and biodiversity; (b) threatening social and economic development; (c) threatening national and international security; and (d) threatening global health (Nellemann et al., 2014; Ratchford, Allgood, & Todd, 2013; Wyler and Sheikh, 2008; Wyler & Sheikh, 2013). Overall, the damaging impacts of the illicit wildlife trade threaten sustainable conservation and international development efforts around the world (Nellemann et al., 2014).

Although the transnational trade of elephant ivory is currently banned by CITES, today ivory is one of the highest globally demanded wildlife products (elephant ivory will from now on be referred to as ivory, unless otherwise noted) (Akella & Allan, 2012; Gao & Clark, 2014; Nijman, 2010; UNEP et al., 2013; WWF & Dalberg, 2012; Wyler & Sheikh, 2013). Ivory consumers are willing to pay exorbitant prices, valued much higher than ivory’s weight in gold, for both legal domestically traded ivory and illegal internationally traded ivory (Akella & Allan, 2012; Nijman, 2010; WWF & Dalberg, 2012; Wyler & Sheikh, 2013). The high demand for ivory and large profit for perpetrators fuel a growing illegal (or illicit) ivory trade (see section, Definition of Terms) (Gao & Clark, 2014; Milliken, 2015; Patel et al., 2015; Ratchford, Allgood, & Todd, 2013; UNEP et al., 2013). The illicit ivory trade is primarily supplied with ivory from African elephant poaching and from unsecure, poorly managed ivory stockpiles legally owned by African elephant range states (see section, Definition of Terms) (Bennett, 2014; Harvey, 2015; Neme, 2013; UNEP et al., 2013). Stockpiled ivory often enters or reenters the illegal trade after being robbed by criminals or being misappropriated by corrupt officials (Bennett, 2014;
Neme, 2013). Therefore, African elephants are one of the species most threatened by the illegal wildlife trade (Conrad, 2012; Harvey, 2015).

Since 2007, the illicit ivory trade has steadily grown. The implications of this growing illicit trade include:

- threatening the survival of elephants, particularly African elephants, and the vital ecosystems supported by these elephants (Akella & Allan, 2012; Bennett, 2014; Bulte, Damania, & van Kooten, 2007; Nellemann et al., 2014; UNEP et al., 2013; WWF & Dalberg, 2012);
- threatening the economic, social, and political development and stability of elephant range states (Lawson & Vines, 2014; Nellemann et al., 2014; Rosen & Smith, 2010; WWF & Dalberg, 2012);

Therefore, the illicit ivory trade must be effectively combatted.

The international community has recently taken action to combat the illegal wildlife trade, including the illicit trade of ivory, and its devastating global implications. The leading collaborative effort is the 2014 London Declaration on the Illegal Wildlife Trade [London Declaration] (see section, Definition of Terms) (London Conference, 2014). The London Declaration recognizes and calls for collective action as the most effective approach for combatting the illegal wildlife trade, particularly the illicit trade of highly demanded products such as ivory.

My master thesis strongly agrees with the international community that a united, cooperative approach is necessary for the most effective combatting of the illegal ivory trade (see
section, Definition of Terms). I narrowed the focus of my master thesis to explore one particular approach to combatting the illegal ivory trade – the management of ivory stockpiles legally owned by African elephant range states. Effective management of these states’ ivory stockpiles is important because unsecure, poorly managed ivory stockpiles supply ivory for the growing illicit ivory trade (Bennett, 2014; Neme, 2013; Harvey, 2015). Currently, African elephant range states are using two opposing (dichotomous) ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale (see section, Definition of Terms).
**Historical Background**

A brief historical background is necessary to understand the use of dichotomous ivory stockpile management strategies by African elephant range states. A highly demanding legal international ivory trade led to a concentrated increase in African elephant poaching during the 1970s and 1980s to supply a growing transnational legal ivory trade (Lemieux & Clarke, 2009; van Kooten, 2008). This poaching crisis significantly decimated the total African elephant population. In order to protect African elephants from further overexploitation, the international community through CITES moved all elephants to an Appendix I status beginning January 1, 1990, and, subsequently, made the international commercial trade of ivory illegal (CITES, n.d.; Lemieux & Clarke, 2009).

Following the ivory trade ban, African elephant populations began to recover and increase. Between 1997 and 2000, four African elephant range states had their well managed and protected elephant populations downlisted from Appendix I to Appendix II by CITES (CITES, n.d.). With Appendix II elephant populations, these four countries are allowed to sell ivory from their legal government-owned ivory stockpiles in CITES-authorized one-off sales to CITES-approved buyers and use the revenue to fund elephant conservation (CITES, n.d.; CITES, 2007; Harvey, 2015). Thus, these countries use an ivory stockpile sale strategy to manage their ivory stockpiles. Due to uncertainty of the impact of ivory stockpile sales as well as to allow time to fully determine the impact, the international community enacted a nine-year moratorium preventing any proposal or another sale of stockpiled ivory until after November 2017 (CITES, 2007; CITES, 2008; Harvey, 2015).

Although the African elephant population had begun to recover following the ivory trade ban, this progress is now being reversed. Since 2007, there has been a steady increase of African
elephant poaching and of illegal ivory trade activity (Conrad, 2012; Harvey, 2015; Milliken, 2014; UNEP et al., 2013). Effective combatting of the illegal ivory trade is necessary in order to protect the elephant population as well as decrease the other negative global implications of this illicit trade (Harvey, 2015).

Alternatively, some African elephant range states have taken an entirely different approach to manage their ivory stockpiles since the ivory trade ban. These African elephant range states have used an ivory stockpile destruction strategy where the country has destroyed a portion of its ivory stockpile through a large public event of burning or crushing the illicit ivory to emphasize its zero tolerance of poaching and the illicit ivory trade (Harvey, 2015; Neme, 2013; Welch, 2016). Additionally, the international community through a specific action of the 2014 London Declaration calls for every country to destroy its legal government-owned ivory stockpile (London Conference, 2014). Since 2014, there has been a major increase in the number of ivory stockpile destructions (London Conference, 2014; Welch, 2016). It should also be noted that other African elephant range states have not yet implemented one of the two ivory stockpile management strategies; instead, these states are storing their ivory stockpiles without currently choosing to sell or destroy them.

African elephant range states’ use of dichotomous ivory stockpile management strategies is facilitated by the international community’s contradiction of calling for one ivory stockpile management strategy – destruction – while continuing to allow a different ivory stockpile management strategy – sale. The use of dichotomous ivory stockpile management strategies by African elephant range states and the problem it poses are explored and addressed by my master thesis.
**Problem Addressed by My Master Thesis**

The international community has agreed on the necessary use of united, cooperative approaches to most effectively combat the illegal wildlife trade, including the illicit trade of ivory. Therefore, African elephant range states’ use of dichotomous ivory stockpile management strategies is a serious problem as it threatens the collective action needed to most effectively combat the illegal ivory trade and its devastating global implications (Harvey, 2015; Kasane Conference, 2015). This presents the question: which ivory stockpile management strategy – (a) ivory stockpile destruction or (b) ivory stockpile sale – should all African elephant range states use for a united, cooperative effort? Answering this question is extremely relevant now as the number of ivory stockpile destructions is rapidly increasing and the end of the moratorium on ivory stockpile sales is rapidly approaching. Therefore, further use of dichotomous strategies by African elephants range states is imminent unless this question is answered.

Before this question can be answered, a preliminary problem is raised and, thus, addressed by my master thesis. Although African elephant range states use two different strategies, their intended outcome is the same: to promote African elephant conservation; to combat illegal African elephant poaching; and to combat the illicit trade of ivory (Bennett, 2014; CITES, 2007; CITES, 2008; Harvey, 2015). By determining which strategy has the most effective outcomes when combatting the illegal ivory trade, there will be greater support for its unanimous use by African elephant range states. Additionally, the strategy chosen for unanimous use must be effectively implemented by all African elephant range states. This requires overcoming the many political and economic factors influencing the current use of dichotomous strategies. Factors of implementation are beyond the scope of my master thesis. I narrowed the focus of my research study to understand which ivory stockpile management strategy – (a) ivory
stockpile destruction or (b) ivory stockpile sale – used by African elephant range states is correlated with better outcomes and, thus, is more effective at combatting the illegal ivory trade.

Furthermore, despite the literature widely debating this topic, the research is inconclusive as to the impact and effectiveness of each ivory stockpile management strategy (CITES, 2007; CITES, 2008; London Conference, 2014; t’ Sas-Rolfes, Moyle, & Stiles, 2014). A review of the debated arguments and counterarguments is fully discussed in my literature review (see Chapter 2). I also identified a gap in the research. Existing literature and research studies have failed to directly compare the outcome of an ivory stockpile destruction strategy used by an African elephant range state to the outcome of an ivory stockpile sale strategy used by an African elephant range state. Overall, it is left undetermined by the literature which strategy is comparatively more effective at combatting the illegal ivory trade.
Purpose of my Master Thesis

Through my unique methodology and results, the purpose of my master thesis is to bridge the current gap in the literature as well as to direct future research by identifying correlations requiring further research. Since the current literature and research are inconclusive and do not identify the most effective ivory stockpile management strategy, it hinders collective action by the international community and African elephant range states. Only through future research producing substantial evidence of the most effective ivory stockpile management strategy, a process foundationally supported by my research study, will African elephant range states be able to shift from their current use of dichotomous strategies to a united, cooperative approach (Duffy & Humphreys, 2014; Harvey, 2015; Lawson & Vines, 2014; London Conference, 2014). With this collective action, their efforts are then guaranteed to be most effectively combatting the illegal ivory trade. Ultimately, the goal is to fully eradicate the illegal ivory trade and its devastating global implications.
Research Question of My Master Thesis

My master thesis uses an inductive, non-experimental research methodology. I conducted a quantitative secondary analysis of archival data to explore and answer my research question: *which elephant ivory stockpile management strategy used by African elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with more effective combatting of the illegal ivory trade, operationalized as decreased behavioral intention to poach as well as decreased poaching behavior?* In order to operationalize the construct of effective combatting of the illegal ivory trade, the theoretical framework of my master thesis was based on Ajzen’s (1991) *theory of planned behavior* (see section, Definition of Terms).

Accordingly and supported by my review of the literature in Chapter 2, the design and methodology of my research study is fully described in Chapter 3. The final three chapters of my master thesis will: (a) describe my data analysis and found results (see Chapter 4); (b) discuss my results and the limitations of my research study (see Chapter 5); and (c) summarize my conclusions and recommendations for future research (see Chapter 6).
Definition of Terms

The following is a list of important terms and their definitions within my master thesis.

**African Elephant Range State**

A country (state) that has wild African elephants living within its national borders. African elephants are found in 35-38 range states in Central, Eastern, Western, and Southern Africa (Lemieux & Clarke, 2009; UNEP et al., 2013).

**Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES]**

In order to protect species from overexploitation caused by a global demand for wildlife and their products, the international wildlife trade had to be regulated. In 1975, the United Nation’s Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES] was passed. Today, it remains the primary mechanism that regulates the international wildlife trade in order to protect endangered species from overexploitation. Since its inception, CITES has through international collaboration and agreement sought: to ensure sustainable extractive use of species; to promote species’ survival; and to legally regulate the global wildlife trade (Abensperg-Traun, 2009; CITES, n.d.; Holden, 1979; IUNC, 2000; Pires & Moreto, 2011; Reeve, 2006; Wyler & Sheikh, 2013).

The convention regulates the international trade of species by categorizing each species into an appendix that outlines its trade parameters (IUNC, 2000; Wyler & Sheikh, 2013). Species are placed into an appendix based on their risk for extinction. Regulated trade is tracked through import and export permits. The CITES’ appendices and their trade parameters are:

- Appendix I meaning international trade is not permitted unless exceptional circumstances;
• Appendix II meaning international trade is limited to non-detrimental exceptions requiring export permits;

• Appendix III meaning international trade of that species is banned in at least one country while recommended for other states to assist in control of its trade;

• any species not listed in these appendices are non-CITES and have no international trade parameters. (CITES, n.d.; Rosen and Smith, 2010; UNEP et al., 2013)

Furthermore, the convention provides a framework for its parties or member countries to pass national laws to protect wildlife against overexploitation due to domestic trade (CITES, n.d.).

**Effective Combatting of The Illegal Ivory Trade**

The construct – effective combatting of the illegal ivory trade – is nominally defined within my master thesis as the use of united, cooperative approaches by the international community to eradicate this illicit trade. This definition was based on the argument of the London Declaration on the Illegal Wildlife Trade that cooperative, united strategies must be used to most effectively combat the illegal wildlife trade (London Conference, 2014). This construct was further operationalized within my research study as decreased intent to poach (behavioral intention) and decreased poaching (behavior) of African elephants. This operationalization was based on the theory of planned behavior (Ajzen, 1991). Therefore, my master thesis assumed that use of a united, cooperative ivory stockpile management strategy by all African elephant range states results in the most effective combatting of the illegal ivory trade.

**Illegal (or Illicit) Ivory Trade**

The illegal (or illicit) ivory trade is defined by my master thesis as all sales, exchanges, or possessions of elephant ivory tusks or ivory products in contravention of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.
Illegal Wildlife Trade

Although it is important to recognize that there is a broader definition of the illegal wildlife trade, my master thesis used a narrower definition in order to better study and explore the trends related to it. The full definition of the illegal wildlife trade according to International Criminal Police Organization [INTERPOL] (2010) is the “taking, trading, exploiting or possessing of the world's wild flora and fauna in contravention of national and international laws” (as cited in Pires & Moreto, 2011, p. 103). For the purposes of my master thesis and its research study, first, I will not explore the illegal trade of flora, for example the timber trade. Second, my thesis will not explore the domestic legal or domestic illegal wildlife trades. Finally, my thesis excludes the killing of protected wildlife for sustenance or due to human-animal conflict, such as a local community killing an elephant that destroyed crops or a tiger that attacked a local person or livestock, from my definition (Nijman, 2010; Pires & Moreto, 2011). Therefore, I define the illegal trade of wildlife as any sale, exchange, or possession of the world’s wild fauna and their products in contravention of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, such as the illicit trade of elephant ivory.

International Community

The international community is defined as the countries of the world considered collectively. For my master thesis, the consensus of the international community is taken from collaborative agreements, declarations, or conventions signed by a large collective group of countries, such as the United Nations’ Convention on International Trade in Endangered Species of Wild Fauna and Flora or the 2014 London Declaration on the Illegal Wildlife Trade.

Ivory Stockpile

Ivory stockpile is defined within my master thesis as a collection of elephant ivory, raw
(tusks) or worked (carved), legally owned and managed by a country. I particularly focus on ivory stockpiles legally owned and managed by African elephant range states. The elephant ivory may come into possession of the country from naturally deceased elephants, euthanized elephants due to human-elephant conflict, or illegally traded ivory confiscated in the country by authorities.

**Ivory Stockpile Destruction**

Ivory stockpile destruction is one of two ivory stockpile management strategies. Within my master thesis, it is defined as the approach of an African elephant range state to manage its elephant ivory stockpile resulting in a publicized event where the country destroys all or a portion of its ivory stockpile through burning or crushing the illicit ivory.

**Ivory Stockpile Sale**

Ivory stockpile sale is one of two ivory stockpile management strategies. Within my master thesis, it is defined as the approach of an African elephant range state to manage its elephant ivory stockpile resulting in CITES listing its African elephant population as Appendix II and then the country sells a portion of its ivory stockpile in a CITES-authorized one-off sale.

**London Declaration on the Illegal Wildlife Trade [London Declaration]**

The London Declaration on the Illegal Wildlife Trade [London Declaration] was established in February 2014 after the international community met at the London Conference on the Illegal Wildlife Trade (London Conference, 2014). The declaration fully recognizes the global impacts of the illegal wildlife trade and is the leading collaborative effort of the international community to combat the illicit trade of wildlife and their products. Furthermore, it calls for a cooperative, united approach to effectively combat the illegal wildlife trade through implementing its three strategies: (a) a demand reduction strategy to decrease the high demand
market; (b) an enforcement strategy to increase enforcement, punitive standards, and capacity to enforce; and (c) an alternative livelihood strategy to promote development efforts to provide alternative economic opportunity for local communities in supply regions (Lawson & Vines, 2014; Duffy & Humphreys, 2014).

Theory of Planned Behavior

Ajzen (1991) published *The Theory of Planned Behavior* in 1991. His theory of planned behavior provides an understanding of and predicts the decisional process of human behavior. His theory argues that human behavior is primarily a result of intention (behavioral intention). Additionally, the theory defines three independent determinants of behavioral intention: attitude, subjective norm, and perceived behavioral control. A high level of behavioral intention, or intent to perform the behavior, is necessary before the behavior is acted out.
CHAPTER 2: LITERATURE REVIEW

The illegal wildlife trade is a growing, lucrative transnational crime characterized by high illicit profits, relatively low risk of getting caught, and minimal punitive action against perpetrators. The main illicit wildlife products traded are elephant ivory, rhino horn, tiger blood, bear bile, shark fin, and pangolin scales (Hastie & McCrea-Steele, 2014; Nellemann, Henriksen, Raxter, Ash, & Mrema, 2014; Sonricker Hansen, Li, Joly, Mekaru, & Brownstein, 2012; Wyler & Sheikh, 2013). In the last decade, the international community and research within this field have increasingly recognized the illegal trade of wildlife as a major threat to social and economic development, national and international security, and global health (Nellemann et al., 2014; Wyler & Sheikh, 2013). These impacts are in addition to the illegal wildlife trade’s well-known and accepted negative impact on the environment and biodiversity. Furthermore, the international community has expressed greater commitment to combatting this illegal trade and diminishing its devastating global impacts.

African elephants are one of the species most threatened by the illegal wildlife trade (Conrad, 2012; Harvey, 2015). African elephant poaching or ivory taken from unsecure, poorly managed ivory stockpiles owned by African elephant range states are the main supply sources of illegal ivory. Today, illegal ivory is illicitly traded predominantly to China and other regions of Asia (UNEP, CITES, IUCN, & TRAFFIC, 2013). This illegal trade threatens the survival of elephants, the social and economic development of elephant range states, and national and international security (Akella & Allan, 2012; Bennett, 2014; Duffy & St. John, 2013; Nellemann et al., 2014; UNEP et al., 2013; van Kooten, 2008; WWF & Dalberg, 2012). Therefore, it is necessary to effectively combat the illegal ivory trade through united, cooperative actions
(Harvey, 2015). One particular action is effective management of the legal government-owned ivory stockpiles (Harvey, 2015; London Conference, 2014).

Specifically, my master thesis is focused on the management of ivory stockpiles owned by African elephant range states. Despite the international community’s recent call for all countries to destroy their ivory stockpiles, the community contradicts itself by continuing to allow legal, regulated sale of ivory stockpiles by authorized countries (CITES, n.d.; London Conference, 2014). This allows the use of two dichotomous ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale – by African elephant range states. This dichotomy goes against the necessary use of a united, cooperative action to effectively combat the illegal ivory trade. Therefore, my thesis conducted the following literature review to explore this dichotomy.

In brief, my literature review chapter has two main parts, a historical background followed by a review of the literature relevant to my research question. The first part of this chapter provides the necessary historical background to understand the illegal wildlife and ivory trades. Each section of the historical background generally summarizes the illegal wildlife trade to provide context for my summary of any available information specific to the illegal ivory trade. The intricacies of the illegal wildlife and ivory trades as well as their devastating impacts are clearly presented through this historical background. Furthermore, this part of the chapter presents the necessary importance of effectively combatting the illegal trade of wildlife and their products, despite the barriers, through united, cooperative actions as outlined by the 2014 London Declaration on the Illegal Wildlife Trade (London Conference, 2014). However, it was found that dichotomous ivory stockpile management strategies are currently being used by African elephant range states.
The second part of this chapter provides a review of the literature on the existing use of dichotomous ivory stockpile management strategies used by African elephant range states. Additionally, it provides a review of the debated effectiveness of each ivory stockpile management strategy. During my review, I found a gap in the literature. This led to the development of my research question and conducted study for my master thesis. This gap in the literature will be discussed prior to concluding this chapter with a summary.
Historical Background

A historical background of the illegal wildlife trade and its impact on African elephants is critical to understand why and how best to combat this transnational crime. As an overview of the historical background part of this chapter, I will first discuss the history of the wildlife trade, specifically the trade of ivory. This includes discussion of the use of wildlife and their products, the overexploitation of wildlife to supply the demand for these products, and how this led to the creation of the Convention on International Trade in Endangered Species of Wild Flora and Fauna [CITES]. Second, the structure of the illegal wildlife and ivory trades will be overviewed to understand its demand side as well as the supply side. Third, the global implications of the illegal wildlife and ivory trades will be outlined, including: the environmental impacts; social and economic impacts; national and international security impacts; and global health impacts. Then, the barriers to combatting the illegal wildlife and ivory trades will be discussed. This is followed by an overview of the international community’s efforts to combat the illegal wildlife and ivory trades, with particular focus on a single action outlined within the 2014 London Declaration on Illegal Wildlife Trade.

History of the Wildlife Trade

The trade of wildlife and their products is not a new practice. It has been likely practiced throughout human history; physical evidence of the wildlife trade can be traced back for thousands of years. The trade in exotic species traces back to 2500 B.C. by the Egyptians and to the 7th century B.C. by the Greeks (Ayling, 2013; van Kooten, 2008). The trade of wildlife and their products are greatly influenced by culture, social practices, medicine, science, myth, and folklore (Haken, 2011; Ratchford, Allgood, & Todd, 2013). Historically as well as today, these influences are important reasons for the high demand for wildlife and their products, irrelevant if
the supply is legal or illegal.

**Uses of traded wildlife and their products.** The use of wildlife and their products spans a wide range of purposes, including: (a) as sustenance or income sources; (b) as superstitious agents; (c) as delicacies; (d) as medicine or falsely perceived medicinal value, such as for sexual potency or as a cure for cancer; (e) as ornaments; (f) as fashion pieces; (g) as exotic pets; (h) for conspicuous consumption; and (h) as financial investments (Felbab-Brown, 2011; Gao & Clark, 2014; Haken, 2011; Ratchford, Allgood, & Todd, 2013; UNEP et al., 2013). Recently, there is increasing use of wildlife products for conspicuous consumption to express one’s wealth or status as well as for financial investment, as notably seen within the illicit trade of ivory (Gao & Clark, 2014; Harvey, 2015; UNEP et al., 2013).

**Traded elephant products.** Ivory is the primary product from elephants that is demanded and traded. There are two species of elephants: *Loxodonta africana* (commonly known as the African elephant with two subspecies including the African Savanna and Forest elephants) and *Elephas maximus* (commonly known as the Asian elephant with a variety of subspecies) (Blanc, 2008; Choudhury et al., 2008). All male elephants typically have ivory tusks. Whereas only female African elephants typically have ivory tusks while female Asian elephants typically do not have tusks. Elephant ivory can be traded as either raw tusks or worked pieces of ivory, such as ivory carvings (see Figure 1 on next page). In addition to ivory, live elephants may be traded as well as elephant-derived products such as meat and leather (UNEP et al., 2013). A history of these non-ivory trades is not further discussed in my literature review.

Ivory has been commercially traded throughout history. The earliest recorded documentation of the trade of ivory appears in 206 B.C. – 220 A.D. during China’s Han Dynasty (Conrad, 2012). Additionally, various Roman, Arab, European, and Asian writers have recorded
the commercial trade of ivory throughout history (van Kooten, 2008). The trade of ivory is even referenced in the Old Testament scriptures of 1 Kings, Ezekiel, and 2 Chronicles (Bible Hub, 2016). For example, King Solomon’s ships brought ivory back from Africa which he used to decorate his palace (1Kings 10:22; 22:39) (Bible Hub, 2016; van Kooten, 2008).

Not only does the trade of ivory date back thousands of years, the use of ivory is also deeply ingrained in many cultures and traditions worldwide. First, the art of ivory carving is deeply rooted in Chinese, Japanese, and other Asian traditions (Gao & Clark, 2014). Ivory carving was extremely important during the Ming (1368-1644 A.D.) and Qing (1644-1911 A.D.) dynasties (Gao & Clark, 2014). The carvings were commissioned and collected during these dynasties by the imperial court, scholar-officials, and the upper classes in order to display their affluence, wealth, and power (Gao & Clark, 2014). Additionally, ivory may be traded for its

Figure 1. Raw and worked ivory. The figure shows an example of worked ivory (carved ivory tusk) as well as examples of raw ivory (elephant tusks). (Source: http://www.reuters.com/article/us-china-ivory-idUSKCN0S90BB20151015)
religious and medicinal purposes. Ivory embodies an essence understood and highly valued within the Buddhist religion resulting in the trade of religious ivory talismans (Gao & Clark, 2014). Also, powdered ivory and bangles have been minimally used within Chinese Traditional Medicine (Gao & Clark, 2014). Finally, Europeans and Americans have historically highly valued the aesthetic beauty of ivory, particularly using it for religious carvings (UNEP et al., 2013). During the middle of the 1900s, European and American use of ivory widely expanded and was highly desired to make piano keys, gun grips, billiard balls, and buttons (UNEP et al., 2013). This demand waned with the introduction of plastic. Currently the demand for ivory is much more specific and localized. Today, the demand is almost exclusively for worked ivory carvings (Gao & Clark, 2014; Harvey, 2015; UNEP et al., 2013). Additionally, the demand is localized primarily to China and Thailand (Gao & Clark, 2014; UNEP et al., 2013).

Currently, China has the largest market for ivory. Ivory is extensively sought for conspicuous or luxury consumptive purposes due to China’s recent economic growth providing increased purchasing power to consumers (Gao & Clark, 2014; Harvey, 2015; UNEP et al., 2013). Also, the high demand and consumption relates to the socially constructed values of ivory within Chinese culture. For example, Gao and Clark (2014) explain that Chinese consumers choose to purchase ivory for the following purposes: (a) as a financial investment because it has economic value with its perception to be inflation-proof, have value appreciation, or like gold; (b) as an art investment because a cultural revival, sparked by the promotion of ivory as intangible cultural heritage in 2002, began a booming ivory art trade; (c) to give consumers prestige or face within society because ivory has social value to reflect one’s monetary wealth and status; or (d) to give consumers prestige or face within society through bestowing it as a gift to another, which is an important cultural practice for maintaining interpersonal relationships,
both personal and professional. Overall, deeply rooted cultural and traditional factors have and continue to drive the increasing demand for ivory.

**Overexploitation of species to supply the wildlife trade.** Tradition, culture, and sustenance as well as economic growth and buying power have played a primary role in creating a high demand for wildlife and their products. Milliken (2014) points out that “wildlife harvest has sustained many of the essential needs of human communities for food, clothing, medicine, utilitarian goods, building materials, adornment, entertainment, companionship and income for centuries” (p. 1). Historically, exploitation for sustenance purposes was often sustainable conducted in a manner that guaranteed the continued survival of all species involved (Milliken, 2014). As the global demand for wildlife and their products increased, an expansive international market and trade developed. However, there is not an endless supply of wildlife. Often in order to meet the growing demands, the supply for the trade began to overexploit species threatening their survival (Milliken, 2014; Rosen & Smith, 2010; WWF & Dalberg, 2012). Milliken (2014) argues two of the most prominently overexploited species for trade of their products are elephants and rhinoceroses.

**Overexploitation of African Elephants.** Overexploitation of elephants in order to supply the demand for them and their products is not a new occurrence. Ayling (2013) describes the exploitation of wildlife by the Romans from around 186 BC to AD 523. Exotic species, including elephants, were overexploited and imported by the Romans in order to use them in their Roman amphitheater games. The demand and supply exceeded sustainable exploitation of the species because the animals were killed for entertainment during the games and each game needed an entirely new supply of exotic animals. Ayling (2013) made an important reference to the research of Leakey and Lewin (1996). Their research determined that the African elephant
sub-species, called the Atlas or Carthaginian elephant, once inhabited Northern Africa but became extinct in the 2nd century B.C. (Leakey & Lewin, 1996, as cited in Ayling, 2013). The use of this species in Roman amphitheater games overexploited this population to extinction. However, the Atlas or Carthaginian elephant population was already heavily exploited. The elephants in this region were locally poached for their ivory and captured for their utility as war animals; most notably, Hannibal Barca used these war elephants during his command of the Punic Carthaginian military and famous crossing of the Alps to attack Rome (Leaky and Lewin, 1996, as cited in Ayling, 2013; Mulligan, 2015).

In more recent history, poachers killing elephants for their ivory tusks in order to supply the global demand for ivory is the primary overexploitation of elephants (UNEP et al., 2013). Elephants are also overexploited by being poached for bush meat and leather, which are the other two in-demand elephant products (Choudhury et al., 2008; Conrad, 2012; UNEP et al., 2013). Yet, the demand for these two products is minimal compared to the demand for ivory. African elephants are more threatened by poaching and overexploitation due to the high demand for ivory because poachers see less value in poaching the small Asian elephant population which also inherently offers less ivory with females usually not having tusks (Milliken, 2014; UNEP et al., 2013). Additionally, the survival of wild elephants is threatened by factors other than overexploitation, such as habitat loss and global warming (Blanc, 2008; Choudhury, 2008; UNEP et al., 2013). Although my thesis narrows its focus to the overexploitation of African elephants due to ivory poaching, I do not want to minimalize: the threat of the illegal ivory trade to the Asian elephant population; the threat of overexploitation due to non-ivory products; and the other threats to the survival of wild elephants (habitat loss and global warming). I believe all of these threats must be combatted in order to effectively protect and conserve all wild elephants.
I chose to specifically focus my thesis on African elephant poaching in order to better explore and understand one of the many factors threatening the survival of wild elephants.

The overexploitation of African elephants due to ivory poaching is a serious threat to this species because it significantly decreases their population numbers. One of the most devastating overexploitations of the entire elephant population occurred during the poaching crisis of the 1970s and 1980s (Lemieux & Clarke, 2009; van Kooten, 2008). For example, the total African elephant population declined from approximately 1.3 million elephants in 1979 to 600,000 elephants in 1989 (Lemieux & Clarke, 2009). The impact differed across the elephant ranges. African elephants are found in 35-38 countries or range states in sub-Saharan Africa and their range spans Central, Eastern, Western, and Southern Africa (see Figure 2 on next page) (Lemieux & Clarke, 2009; UNEP et al., 2013). Elephant presence and range is uncertain in Senegal, Somalia, and Sudan due to lack of reporting related to the instability of these countries. The largest, well-managed elephant populations are in Southern Africa while the populations in Central and Western Africa are smaller and less protected (UNEP et al., 2013, p. 15). As such, the elephants in Central and Western Africa were dramatically decreased during the poaching crisis (Lemieux & Clarke, 2009).

Poaching is particularly devastating because it can decrease the elephant population at a rate higher than their natural population growth rate (UNEP et al., 2013). Additionally, poaching removes the best specimens and skews the sex ratio of the population (Mondol, Mailand, & Wasser, 2014; UNEP et al., 2013). The poaching crisis of the 1970s and 1980s required action by the international community to protect elephants from continued overexploitation. This resulted in the 1989 ivory trade ban by the Convention on International Trade of Endangered Species of Wild Fauna and Flora [CITES] prohibiting international commercial trade of ivory (CITES, n.d.;
Lemieux & Clarke, 2009).

**Figure 2.** African elephant population by country in 2007. The figure shows the estimated minimum to maximum population of African elephants in each African elephant range state, as recorded by the African Elephant Database. (Source: UNEP et al., 2013, p. 25)

**Protection of overexploited species through CITES.** In order to protect species threatened by overexploitation fueled by a global demand for wildlife and their products, the
international community acted by regulating the international commercial trade of wildlife and their products. This regulation and subsequent criminalization did not occur until 1975 (Ayling, 2013). The first recognition of the need to regulate the wildlife trade occurred at a meeting of the international community in 1900 and resulted in the London Convention Designed to Ensure the Conservation of Various Species of Wild Animals in Africa (IUCN, 2000). However, the convention did not gain the support of enough nations (referred to as Parties) and failed to enter into force. A similar international convention designed to prevent overexploitation of wildlife was able to gain enough support and entered into force in 1936 but failed to be effective when only a few Parties ratified its recommendations into their national legislation (IUCN, 2000).

Beginning in the 1960s, there was a global shift towards international cooperation to protect wildlife by controlling the growing wildlife trade. This global shift included a series of wildlife protection resolutions from the International Union for Conservation of Nature, drafts of more conventions, and countries passing national legislation regulating wildlife trade (IUCN, 2000). This set the stage for a meeting of the international community in 1973 at the Washington Conference (IUCN, 2000). At this conference, the international community adopted the Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES], which formally entered into force in 1975 (CITES, n.d.).

Since 1975, CITES has been and remains the primary international collaboration and agreement to monitor and regulate the transnational commercial trade of wildlife (Abensperg-Traun, 2009; CITES, n.d.; Holden, 1979; IUCN, 2000; Pires & Moreto, 2011; Reeve, 2006; Wyler & Sheikh, 2013). Its purpose is to ensure sustainable extractive use of species and promote species survival. The trade is regulated by CITES categorizing endangered species into three appendices, which outline specific trade parameters, and, then, export and import permits
are used to monitor the trade (IUCN, 2000; Wyler & Sheikh, 2013). Species are placed into one of three trade appendices based on their risk for extinction. Challender, Harrop, and MacMillian (2015a) explain the CITES’ appendices:

- “Appendix I—Includes species threatened with extinction. Trade for commercial purposes is prohibited and only permitted in exceptional circumstances, subject to the grant of import and export permits (Article III)” (p. 130);
- “Appendix II—Includes species that could become threatened with extinction from international trade unless it is regulated. Trade is subject to the grant of (re-)export permits based on a NDF, which is a declaration that trade in specimens of a given species will not be detrimental to the survival of that species in the wild. This calls on Parties to limit trade such that species are maintained throughout their range at levels consistent with their ecosystem roles and above levels at which they would be eligible for inclusion in Appendix I (Article IV, 3)” (p. 130);
- “Appendix III—Includes species for which trade is regulated by one Party, but that Party requests the cooperation of other signatories in preventing unsustainable trade. Trade is subject to the grant of export permits (Article V)” (p. 130).

Furthermore, the convention provides a framework for its 181 Parties or member countries to pass national legislation to regulate trade and protect wildlife (Cites, n.d.). Overall, CITES is a crucial international collaboration and framework for combatting the illegal wildlife trade, but most importantly it legalized international trade of threatened wildlife and their products.

**Elephant ivory trade ban.** The dramatic decrease in the elephant population as a result of the poaching crisis of the 1970s and 1980s required the international community to address overexploitation of African and Asian elephants in order to protect these species (Lemieux &
Clarke, 2009; van Kooten, 2008). The international community took action through the Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES] and in 1989 decided on internationally banning the commercial trade of ivory (CITES, n.d.). *Elephas maximus* (Asian elephants) were already raised to Appendix I in 1975 due to their endangerment (CITES, n.d.). However, the 1989 ivory trade ban decision led to the listing of *Loxodonta africana* (African elephants) as Appendix I beginning January 1, 1990 (CITES, n.d.).

The African elephant population began to recover and grow following the ivory trade ban, particularly the elephant populations in Southern and Eastern Africa (UNEP et al., 2013). As a result, some of the African elephant range states in Southern and Eastern Africa with well-managed elephant populations petitioned CITES to downlist their populations to Appendix II status. The African elephant populations of Botswana, Namibia, and Zimbabwe were downlisted in 1997 followed by the African elephant population of South Africa being downlisted in 2000 (CITES, n.d.). These four countries remain today as the only elephant populations with an Appendix II status by CITES (CITES, n.d.). The Appendix II status allows these countries to sell their ivory stockpiles under regulated trade conditions. This quota trade system functions through legal CITES-authorised joint one-off ivory stockpile sales to CITES-approved buyers. Two joint one-off sales have occurred since 1997 (CITES, 2007; CITES, 2008). Ivory stockpile sales will be discussed further in the literature review part of this chapter.

Despite the improvement of elephant populations following the ivory trade ban, another alarming poaching crisis and dramatic decrease in the total number of African elephants began in 2007 (t’ Sas-Rolfes, Moyle, & Stiles, 2014; UNEP et al., 2013; Wittemyer et al., 2014). Again, this second poaching crisis is fueled by an increasing demand for ivory. It has resulted in a growing illegal ivory trade. Although unsecure, poorly managed ivory stockpiles owned by
African elephant range states are a source of illicit ivory entering the illegal ivory trade, the main source is ivory directly taken from illegally poached and killed African elephants (Bennett, 2014; Douglas-Hamilton, 2013; Milliken, 2015; Welch, 2015). The percentage of illegally killed African elephants [PIKE], recorded by the CITES’ Monitoring the Illegal Killing of Elephants [MIKE] Program, has been steadily increasing since 2007 (see Figure 3) (UNEP et al., 2013). Similar to the first poaching crisis, the elephants in Central and Western Africa are the most heavily poached populations (IUCN/AfESG, 2016; UNEP et al., 2013). As elephant populations in Central and Western Africa further decline, Bennett (2014) argues that fairly well-managed and secured elephant populations in Southern and Eastern Africa will face a much greater risk of poaching compared to their current lower rate of poaching.

Furthermore, the Elephant Trade Information System (ETIS), which monitors the confiscations of illegally traded ivory transactions, has reported increased activity within the
The illicit trade (see Figure 4 on previous page). Its data showed that “seizure of large shipments of ivory hit an all-time high in 2011, indicating an increasingly active, profitable and well-organized illegal ivory trade between Africa and Asia” (Milliken, 2014; UNEP et al., 2013, p. 6). Overall, the result is a decreasing total African elephant population in order to supply a growing illegal ivory trade (Conrad, 2012; Milliken, 2014; UNEP et al., 2013). Therefore, it is crucial to combat the illegal ivory trade and poaching of African elephants to protect the species from history repeating itself with a second major poaching crisis, which could feasibly remove this species from the wild in Central and Western Africa. Before determining how best to do so, it is necessary to understand how the illegal wildlife trade operates, including the illicit trade of ivory.

**Illegal Wildlife Trade**

The international illegal wildlife trade (also referred to as the illicit wildlife trade, wildlife trafficking, and wildlife crime) is a transnational environmental crime. The World Wildlife Fund defines it as an “environment-related crime that involves the illegal trade, smuggling, poaching, capture or collection of endangered species, protected wildlife (including animals and plants that are subject to harvest quotas and regulated by permits), derivatives or products thereof” (WWF & Dalberg, 2012, p. 9). Similarly, it is defined by the International Criminal Police Organization [INTERPOL] (2010) as the “taking, trading, exploiting or possessing of the world's wild flora and fauna in contravention of national and international laws” (as cited in Pires & Moreto, 2011, p. 103). Albeit the legal international wildlife trade is estimated at over $300 billion per year and, arguably, requires better regulation, this topic is beyond the scope of my thesis. I have chosen to narrow my focus to exploring the alarming scope, growth, and detriments of the illegal wildlife trade, particularly the illegal ivory trade (Lawson & Vines, 2014; Nellemann et al., 2014; Ratchford, Allgood, & Todd, 2013). Furthermore, for the purposes of my master thesis, the
illegal wildlife trade will be defined as any sale, exchange, or possession of the world’s wild fauna and their products in contravention of CITES. Following then, the illegal ivory trade is defined as all sales, exchanges, or possessions of elephant ivory tusks or ivory products in contravention of CITES.

The illegal wildlife trade is a growing, lucrative transnational environmental crime (Elliott, 2012; Warchol, Zupan, & Clack, 2003). The value of the global illegal wildlife trade is estimated to be US $7.8 to $10 billion annually, excluding fish and timber trades (Haken, 2011). However, when excluding only the timber trade, the illegal wildlife trade is conservatively estimated at a total value of US $12 to $19.5 billion (Haken, 2011). As such, the illegal wildlife trade is comparable to other transnational crimes (see Table 1 on next page). As of 2011, the illegal wildlife trade is ranked “as the fourth largest global illegal activity after narcotics, counterfeiting, and human trafficking, and ahead of oil, art, gold, human organs, small arms, and diamonds” (Ratchford, Allgood, & Todd, 2013, p. 4). More recently, Wyler and Sheikh (2013) argue the estimated value of the illegal wildlife trade, excluding timber, had increased to a total of US $17 to $23 billion annually. It is only continuing to grow as shown by trends of increased poaching of many protected species, particularly elephants for their ivory tusks and rhinoceros for their horns, to supply the increased demand (WWF & Dalberg, 2012).

It is extremely challenging to assess the true scale of the illegal wildlife trade. Reasons for this include: (a) it does not have the attention or precedence to be tracked similar to other crimes, such as drug trafficking, human trafficking, or money laundering; (b) it is part of the criminal industry meaning there is a great deal of undocumented and untraceable revenue; and (c) it is difficult to accurately estimate the physical amounts of wild animals and their products illegally sold in the global black market or the extent of the overexploitation on species (Felbab-
Brown, 2011; Ratchford, Allgood, & Todd, 2013; Warchol, Zupan, & Clack, 2003). Due to the challenges of determining its scale, the assessed value of the illegal wildlife trade is likely underestimated (Felbab-Brown, 2011).

Table 1. Illegal transnational trade markets and their estimated value. The table shows the different illicit transnational markets (left column) and their estimated value in US dollars in 2011 (right column). (Source: Haken, 2011, p. 56).

<table>
<thead>
<tr>
<th>Market</th>
<th>Estimated Value of illicit international trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs</td>
<td>$320 billion</td>
</tr>
<tr>
<td>Humans</td>
<td>$31.6 billion</td>
</tr>
<tr>
<td>Wildlife</td>
<td>$7.8 to $10 billion</td>
</tr>
<tr>
<td><strong>Counterfeiting Total</strong></td>
<td><strong>$250 billion</strong></td>
</tr>
<tr>
<td>Counterfeit Pharmaceuticals</td>
<td>$35 to $40 billion</td>
</tr>
<tr>
<td>Counterfeit Electronics</td>
<td>$50 billion</td>
</tr>
<tr>
<td>Counterfeit Cigarettes</td>
<td>$2.6 billion</td>
</tr>
<tr>
<td>Human Organs</td>
<td>$614 million to $1.2 billion</td>
</tr>
<tr>
<td>Small Arms &amp; Light Weapons</td>
<td>$300 million to $1 billion</td>
</tr>
<tr>
<td>Diamonds &amp; Colored Gemstones</td>
<td>$860 million</td>
</tr>
<tr>
<td>Oil</td>
<td>$10.8 billion</td>
</tr>
<tr>
<td>Timber</td>
<td>$7 billion</td>
</tr>
<tr>
<td>Fish</td>
<td>$4.2 to $9.5 billion</td>
</tr>
<tr>
<td>Art and Cultural Property</td>
<td>$3.4 to $6.3 billion</td>
</tr>
<tr>
<td>Gold</td>
<td>$2.3 billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$639 to $651 billion</strong></td>
</tr>
<tr>
<td><strong>Approximation</strong></td>
<td><strong>$850 billion</strong></td>
</tr>
</tbody>
</table>

To better understand this growing illicit transnational crime, I will next describe the demand for and supply of illicit wildlife and their products within the illegal wildlife trade. I will, also, specifically discuss the supply of and demand for illicit ivory.

**Demand for illegal wildlife and their products.** The illegal wildlife trade is similar to any trade operating on supply and demand principles. In general on the demand side of the illegal wildlife trade, the largest markets are in China, the United States of America, and the European Union (Haken, 2011; Ratchford, Allgood, & Todd, 2013; Warchol, Zupan, & Clack, 2003; Wyler & Sheikh, 2008).
Consumers driving the demand for wildlife and their products can be generalized into the following groups: (a) individuals buying for traditional, cultural, religious, and superstitious purposes; (b) individuals opportunistically buying to possess rare or exotic pets or items; and, the most common today, (c) individuals, primarily located in newly developed regions, capable of paying high prices as well as who are seeking to show their affluence or social status through their purchases or making investment purchases (Akella & Allan, 2012; Haken, 2011; Ratchford, Allgood, & Todd, 2013; WWF & Dalberg, 2012). Not only does high global demand influence the species that are illegally overexploited, but also it has led to the development of a highly complex and illicit transnational network to supply consumers. Before discussing the supply side, a review of the ivory demand market follows.

**Demand for illicit ivory.** A variety of cultural, economic, and social factors have influenced the high demand and price paid for ivory, irrespective of the ivory being illicit or not. Historically, the high demand for ivory was spread across the world with large markets in Japan, the United States of America, and Europe. Today, the demand market has localized. By researching ivory seizure data, Underwood, Burn, and Milliken (2013) found evidence of a rapidly increasing illegal ivory trade resulting from a growing demand for ivory in China and Thailand. Similarly, Patel et al. (2015) quantitatively measured the prevalence of countries involved in the illegal trade of elephant, rhinoceros, and tiger products. They found the key importers of ivory in descending order were China, Hong Kong, Thailand, and Vietnam (Patel et al., 2015). With the exception of some spikes in online illicit sales of ivory in the United States in the late 2000’s, the demand for illicitly traded ivory is principally in Asia (Ratchford, Allgood, & Todd, 2013; UNEP et al., 2013).
The research strongly supports the conclusion that China is the largest demand market for legal and illegal ivory (Gao & Clark, 2014; Patel et al., 2015; Vira, Ewing, & Miller, 2014; UNEP et al., 2013). Related to increased demand for ivory, China has seen a dramatic increase in the wholesale price of ivory from an estimated US $450 per kilogram in 2010 to an estimated US $2,100 per kilogram in 2014 (Vira, Ewing, & Miller, 2014, p. 40). Furthermore, China’s large legal domestic trade, including a large online market, serves as conduit for sale of illegal ivory and, thus, facilitates the illegal ivory trade (Gao & Clark, 2014; Vira, Ewing, & Miller, 2014; UNEP et al., 2013). Interestingly, in September 2015, China along with the United States of America announced they would enact a nearly complete ban on ivory import and export as well as China would ban its legal domestic ivory trade (The White House, 2015). However, this has not yet resulted in any policy and, therefore, will not be further discussed within my master thesis.

Although ivory demand in China waned through most of the 20th century (due to civil wars and the Maoist communist regime), Chinese demand for ivory has dramatically returned since the economic liberalization in the late 20th century (Gao & Clark, 2014). The returned demand is attributed to: (a) the economic growth of China; (b) increase of individual wealth and buying power; (c) increased conspicuous consumption of ivory and ivory art investment by consumers; and (d) a revived cultural value of ivory carving and collection (Gao & Clark, 2014; Milliken, 2014; UNEP et al., 2013).

As the Chinese are the largest consumers of ivory, the motivations for their consumption offer the best understanding of the demand for illicit ivory. Harvey (2015) identified the three types of consumers explaining the motive behind their consumption. He intended this information to better inform ivory demand reduction campaigns and more effectively combat the
illegal ivory trade by being able to specifically target campaigns towards all consumers.

First, there are consumers that purchase ivory as an investment. Ivory is durable and non-perishable making it ideal for storing as an investment, similar to gold or silver (Bennett, 2014). Also, it is considered to be inflation-proof and of increasing value appreciation as elephants and ivory become scarce. Therefore, these consumers will continue to drive demand for ivory unless their tastes change. Bennett (2014) argues that ivory consumers may not be the only individuals interested in ivory as an investment; criminals could also have reason to stockpile illegal ivory for higher profits at a later time.

Next, Harvey (2015) identifies consumers who purchase ivory for its ability to bring them prestige and status. This is strongly aligned with the importance of face and gift giving within Chinese culture. Gift giving is almost required within Chinese business culture; ivory’s perceived prestige and status make it an exceptional gift. This conspicuous, luxury consumption is related to the increasing purchase power of many Chinese consumers (Gao & Clark, 2014).

The third type of ivory consumers is the purchaser of affordable carved ivory trinkets (Harvey, 2015). If the Chinese economy continues to grow, these consumers with increased buying power could consume greater amounts of ivory and higher priced ivory products (Harvey, 2015). This could increase the demand for ivory and, therefore, increase elephant poaching to supply this increased demand.

Furthermore, Harvey (2015) argues that these three Chinese consumers are not limited to only purchasing ivory in China, the largest demand market in the world. These Chinese consumers are likely increasing ivory consumption in Africa. There has been an increase in Chinese businessmen, foreign investors, and individuals involved with infrastructure development projects working in Africa. The presence of these consumers (with buying power
and cultural or traditional motivations to consume ivory) have likely increased the demand for
ivory in Africa domestic ivory markets and, therefore, likely increased African elephant
poaching necessary to supply this new demand (Harvey, 2015; UNEP et al., 2013).

Also, Harvey (2015) argues for greater consideration of ivory’s price elasticity due to
these different types of consumers and its impact on the demand for ivory. He states “ivory
appears to be an unusual form of luxury good. Theoretically, demand for normal luxury goods is
price-elastic (the quantity demanded is relatively sensitive to changes in the price)” (Harvey,
2015, p. 9). An article by t’ Sas-Rolfes, Moyle, and Stiles (2014) also expresses the importance
for understanding this relationship as it impacts effectiveness of trade restrictions and demand
reduction campaigns. They explain:

If buyers are relatively insensitive to higher prices and tend to sustain their consumption,
the demand is price inelastic and trade bans face significant hurdles. Even a small
reduction in supply will lead to correspondingly larger increases in price. Conversely, if
demand is highly elastic, increasing legal supply may have little effect on prices or levels
of illegal exploitation. The price elasticity of demand for carvings needs to be understood
and not conflated with income increases that also affect demand. (t’ Sas-Rolfes, Moyle,
& Stiles, 2014, p. 69)

Overall, these factors show the extremes of the high demand for ivory and its ability to fuel the
illegal ivory trade and the poaching of African elephants to supply this demand. Before
specifically discussing the supply of illicit ivory, I will first generally discuss the supply chain of
illegal wildlife trade.

**Supply of illegal wildlife and their products.** Within the illegal wildlife trade, sub-
Saharan Africa and Southeast Asia (regions often characterized by their high biodiversity and
concentration of developing nations) are the largest suppliers of wildlife or their products (Haken, 2011; Ratchford, Allgood, & Todd, 2013; Rosen & Smith, 2010). Wildlife and their products are trafficked from these regions to the demand markets around the world in one of three ways: (a) transporting them by land, air, or sea by hiding them in shipping containers, cargo, personal luggage, or worn clothing; (b) transporting them through legal conduits by fraudulently declaring them on custom forms or trade permits, such as claiming them as look-alike items, non-protected species, declaring less than the actual number being shipped, declaring a worth lower than actual value, or declaring wild species falsely as captive-bred species; or (c) transporting them through legal conduits by using forged or stolen trade permits (Wyler & Sheikh, 2008).

Furthermore, the literature agrees that the illegal wildlife trade is comprised of a complex supply network driven by economic motivation. However, there is disagreement on the exact structure of that network. On one side, Pires and Moreto (2011) as well as others argue that there is a more defined network involving a “multi-level chain that typically involves poachers, middlemen, processing centers, and markets” (Pires & Moreto, 2011, p. 104; WWF & Dalberg, 2012). Figure 5 (see on next page) shows a generic example of the illegal wildlife supply-demand chain. Pires and Moreto (2011) argue that impoverished locals most often commit the initial poaching either as an opportunistic economic opportunity or under coercion from crime syndicates (Pires & Moreto, 2011; TRAFFIC, 2008). They, then, argue that after the initial act of poaching the supply chain becomes more organized. This includes local, regional, and international middlemen using processing centers and markets. Pires and Moreto (2011) note, “depending on the species and region of the world, 'organized' can simply mean anything from
three individuals who are loosely organized together to a vast criminal enterprise that comprises all stages of the wildlife trade” (p. 104).

![Figure 5. A generic supply-demand chain. The figure shows the flow of illicit wildlife through the illegal wildlife trade from the source country (right) through transit country(s) (middle) to the consumer country (left). (Source: WWF & Dalberg, 2012, p. 11)](image)

Alternatively, Wyler and Sheikh (2013) along with Warchol, Zupan, and Clack (2003) argue that there is no one distinct chain to describe poaching and wildlife trafficking. Each illicit trade is unique and entirely different. Regardless of the supply-demand chain structure, it is agreed that the high demand and paying market for illegal wildlife and their products drives perpetrators to poach wildlife and continually supply the illicit trade. As such, the primary motivating factor for perpetrators is the economic incentive, whether it is to achieve a small income to support one’s livelihood or a major profit for an illicit criminal network (Pires & Moreto, 2011; Warchol, Zupan, & Clack, 2003; Wyler & Sheikh, 2008; Wyler & Sheikh, 2013). Next, the supply chain of the illegal ivory trade will be more specifically discussed.

**Illicit ivory supplied by poaching and unsecure ivory stockpiles.** Ivory enters the illegal ivory trade by: (a) being directly poached from illegally killed elephants, primarily African
elephants (Bennett, 2014; t’ Sas-Rolfes, Moyle, & Stiles, 2014; UNEP et al., 2013) or (b) corrupt removal or criminal raiding of legal government-owned ivory stockpiles, primarily owned by African elephant range states, that are unsecure and poorly managed (Bennett, 2014; Douglas-Hamilton, 2013; Neme, 2013; Welch, 2015). As the supply and demand locations are continents apart, the illicit ivory must be transported from Africa to the main demand markets in China and other Asian countries (Bennett, 2014; t’ Sas-Rolfes, Moyle, & Stiles, 2014). The supply chain of the illicit ivory trade is therefore very elaborate with illicit ivory handled by many parties from the time the ivory is supplied in Africa until it is consumed in Asia (Bennett, 2014; t’ Sas-Rolfes, Moyle, & Stiles, 2014).

Milliken (2014) studied the supply chain routes of the illegal ivory trade overtime. He found that the frequency and scale of large illegal ivory movements have significantly increased since 2000 (Milliken, 2014). Since 2009, he argues the primary transportation of large amounts of illegal ivory is in large, containerized shipping from seaports in Africa to Asia (Milliken, 2014). Additionally, he found that trade routes continually change. For example, during 2009-2011, the supply shifted from originating out of the seaports in Western and Central Africa to leaving from seaports in Eastern Africa. Regardless of the path the illicit ivory took, he found that ivory increasingly originated in Africa and ended in Chinese markets during this period (Milliken, 2014).

Similar to the general trend of the illegal wildlife trade, the illegal ivory trade is increasingly being run by organized criminal syndicates and networks (t’ Sas-Rolfes, Moyle, & Stiles, 2014; UNEP et al., 2013). These syndicates and networks are not passive. Rather, they exert violence, concealment, bribery, and other methods to actively and successfully avoid law enforcement in order to illicitly supply ivory for the illegal ivory trade (t’ Sas-Rolfes, Moyle, &
Stiles, 2014; UNEP et al., 2013). Additionally, these groups have the capacity to necessarily move large-scale illicit ivory shipments from Africa to Asia (UNEP et al., 2013, p. 6).

Related to the supply chain of the illegal ivory trade, the supply of illicit ivory for the illegal trade is facilitated by the high concentration of developing nations in sub-Saharan Africa. The common structures of developing countries within this supply region enable criminals to more easily poach African elephants for their ivory and supply this illicit trade. The five common structures identified in the literature are: corruption, weak governance, violent conflicts, poverty, and domestic ivory markets. These common structures will be overviewed now; they are also discussed later in this chapter as a barrier to combatting the illegal wildlife and ivory trades.

First, Bennett (2014) explains that corruption allows for the laundering of illegal ivory into legal conduits of trade. This may include bribing officials to overlook illegal activities of poaching, trade, and transport or to falsely alter and certify necessary paperwork and permits (Bennett, 2014; Bulte, Damania, & van Kooten, 2007; UNEP et al., 2013). Additionally, corruption undermines and weakens governance.

Second, Wyler and Sheikh (2013) reported that weak governance is also a factor. It has been consistently shown in the research that indicators of poor governance, such as the World Bank’s Worldwide Governance Indicators or Transparency International’s Corruption Perceptions Index, are strongly correlated with poaching levels more so than any other national-level indicator (UNEP et al., 2013).

Third, UNEP, CITES, IUCN, and TRAFFIC (2013) explain that in the last few decades elephant poaching has most often occurred in conflict regions. These regions facilitated poaching due to the presence of lawlessness and abundance of small arms. However, this trend is becoming less apparent as poaching is increasingly happening across all of Africa, regardless if it
is a conflict or non-conflict region. Additionally, criminal organizations use violence and create conflict, such as conducting mass scale elephant poaching operations using sophisticated intelligence equipment, powerful weapons, and helicopters while killing the law enforcement or conservation officials attempting to stop them (Milliken, 2014; UNEP et al., 2013).

Fourth, poverty facilitates poaching and the supply of illicit ivory because criminal organizations are able to “recruit, bribe or threaten locals and underpaid police, military personnel and wildlife rangers” (UNEP et al., 2013, p. 6). Locals with no alternative livelihood often turn to elephant poaching to sustain their families (Bennett, 2014). Also, poverty leads to human-elephant conflict when locals and elephants must compete for usage of the same land to both survive (UNEP et al., 2013). Angry locals for the initial reason of crop destruction may illegally kill an elephant, but often the ivory does not remain with the carcass.

Finally, many major cities in African elephant range states have thriving domestic ivory markets (UNEP et al., 2013). These exist despite many of these countries having national legislation prohibiting the domestic trade of ivory. The easy access for ivory consumption increases demand resulting in increased poaching to supply this demand and, often, illicit ivory trade.

In addition to African elephant poaching, the other source of illicit ivory into the illegal ivory trade is from ivory stockpiles legally owned by African elephant range states (Bennett, 2014; Douglas-Hamilton, 2013; Welch, 2015). Again, corruption and violence are factors related to this source. Ivory from these stockpiles often enters or reenters the illegal ivory trade. This occurs in two ways: (a) corruption leading to ivory disappearing from these stockpiles, such as corrupt officials illegally selling it for personal profit or (b) criminals raiding and stealing ivory from these stockpiles for illegal sale (Bennett, 2014; Douglas-Hamilton, 2013; Welch, 2015).
Overall, the supply side of the illegal ivory trade is currently threatening the African elephant population. The high demand for ivory is currently fueling a second African elephant poaching crisis. African elephant poaching to supply the trade is unsustainable (Douglas-Hamilton, 2013; Harvey, 2015). The population growth rate of African elephants cannot support the current demand and supply of this illicit trade (Bennett, 2014; Harvey, 2015; UNEP et al., 2013; Wittemyer et al., 2014). If the supply of this illicit trade (increased African elephant poaching and poor management of ivory stockpiles by African elephant range states) is left unabated, there is a grave threat to the survival of the wild elephant population, particularly the decimated African elephant populations in Central and Western Africa (Douglas-Hamilton, 2013; Harvey, 2015; UNEP et al., 2013). However, the implications of the illegal wildlife and ivory trades go beyond negatively impacting the survival of elephants or other threatened species.

**Global Implications of the Illegal Wildlife Trade**

The illegal wildlife trade is a growing, lucrative transnational environmental crime, which includes an increasing illicit ivory trade. The international community has only recently recognized and accepted that the impact of illegal wildlife trade goes beyond its environmental impacts of endangering species, disrupting ecosystem stability, and threatening biodiversity conservation. A 2008 report by the International Fund for Animal Welfare was one of the first publications of its kind to assert that the illicit trade in wildlife is not just an environmental crime with environmental impacts (Ratchford, Allgood, & Todd, 2013). Since 2008, the problem has continued to worsen and the international community has taken notice. On May 1, 2013, the United Nations Commission on Crime Prevention and Criminal Justice agreed to a resolution calling on the nations of the world to “recognize wildlife and forest crimes as a serious form of
organized crime and strengthen penalties against criminal syndicates and networks profiting from such illegal trade” (Ratchford, Allgood, & Todd, 2013, p. 4).

The illegal wildlife trade is recognized as a threat to: (a) the environment; (b) social and economic development; (c) national and international security; and (d) global health (Nellemann et al., 2014; Wyler and Sheikh, 2008; Wyler & Sheikh, 2013). Moreover, each of its impacts and the relevant research will be discussed in detail, including more specific impacts of the illicit ivory trade.

**Environmental impacts.** It has long been recognized that the illegal wildlife trade threatens the environment in multiple facets. First, overexploitation by the illegal trade decreases species’ populations, particularly threatening endangered species and, at times, leading to their extinction (Wittemyer et al., 2014; WWF & Dalberg, 2012). Nijman (2010) and Ayling (2013) argue that species’ survival is not only threatened by overexploitation due to the illegal wildlife trade but is also further susceptible to habitat loss, invasive species, and global climate change. Ayling (2013) states that illegal wildlife trade and these other factors combined have decreased the populations of all vertebrates by an average of 30% between 1970 and 2005.

Furthermore, the illicit wildlife trade removes the fittest individuals or best specimens from the breeding population due to their increased attractiveness and value within the illicit trade (Rosen & Smith, 2010; Tella & Hiraldo, 2014). Simultaneously, the demand for these desired species and their products increase because the supply is reduced. This, in turn, causes the remaining best specimens to increase in value leading to a cycle of more poaching (Tella & Hiraldo, 2014). Further, when critically threatened or endangered species have a small existing population and are highly demanded, the impact of poaching and its overexploitation is further pronounced (Felbab-Brown, 2011). As each individual is removed, there is a significant
detriment to the population’s ability to ever possibly recover and survive.

Second, the illegal wildlife trade poses a risk of introducing invasive species, which threaten native species by disrupting ecosystems and spreading disease (Derraik & Phillips, 2010; Karesh et al., 2007; Rosen & Smith, 2010; WWF & Dalberg, 2012). The illegal wildlife trade can result in theintroductive of invasive species locally or even globally, such as releasing exotically owned pets in non-native habitats. Introduction of invasive species globally by the illegal wildlife trade is a growing issue because of the increased ease and accessibility to illegally purchase live-specimens, such as exotic pets, through online internet sale (Derraik & Phillips, 2010; Hastie & McCrea-Steele, 2014). For example, Derraik and Phillips (2010) researched invasive species (not native to the country) in New Zealand. They found the invasive species had been illegally traded online and then either intentionally or accidentally been released.

Third, this illicit trade disrupts environmental ecosystems upon which humans and wildlife critically rely. Humans around the world rely on biological diversity and thriving ecosystems for: (a) livelihood; (b) fresh water supply; (c) arable land for sustainable harvests; (d) sustenance species; (e) medicines; (f) buffering effects of extreme weather; (g) future development and economic opportunities, such as tourism; and (h) nature resource revenue to support developing economies (Nellemann et al., 2014). Although ecosystems and biological diversity are threatened by a number of environmental insecurities, a major threat is the “smuggling of endangered, threatened, and protected species” (Elliott, 2012, p. 89).

Finally, the illegal wildlife trade disrupts, reverses, or prevents conservation efforts to preserve and promote the survival of species, healthy ecosystems, and biodiversity (WWF & Dalberg, 2012). Biodiversity is defined as:

the term given to the variety of life on earth. [It] comprises all the millions of different
species that live on our planet, as well as the genetic differences within species. It also
refers to the multitude of different ecosystems in which species form unique
communities, interacting with one another and the air, water and soil. (WWF, n.d.,
para. 1-2)

To understand the scale of this impact, Akella and Allan (2012) maintain that in the past decade
the illegal wildlife trade has exponentially increased its role in the decline of many threatened
species. Felbab-Brown (2011) focused his work on the illegal wildlife trade in Southeast Asia
and found that if unabated, “scientists believe that 13% to 42% of Southeast Asian animal and
plant species will be wiped out this century. At least half of those losses are species endemic to
Southeast Asia and hence would represent global extinctions” (p. 6). The illegal wildlife trade’s
devastating impact is not limited to the environment. It, also, threatens social and economic
development. Before exploring another impact, a review of the environmental impact of the
illicit ivory trade is presented.

**Environmental impacts of the illicit ivory trade.** The illicit ivory trade has a devastating
impact on the African elephant population as well as African ecosystems. Poaching of elephants
to supply the illegal wildlife trade has dramatically increased and continues to decrease the total
African elephant population. The African elephant population was estimated in 2007 between
470,000 and 690,000 and has decreased in six years to between 400,000 and 630,000 in 2013
(IUCN/AfESG, 2016). Supporting that this decline was strongly related to poaching, there was
also during this time an increase in the percentage of illegally killed African elephants. The
CITES’ Monitoring the Illegal Killing of Elephants (MIKE) Program has shown a steady
increase of illegal killing since 2006 (UNEP et al., 2013). The African elephant populations in
Western and Central Africa have the highest poaching rates and, hence, the greatest population
decline (UNEP et al., 2013). Since 2002, Milliken (2014) argues the Central African elephant population has decreased by 60% with forest elephants in the Congo Basin declining by 76%.

The current demand for ivory and poaching to supply it is unsustainable, particularly for African elephants in Central and Western Africa. Wittemyer et al. (2014) explains that elephants have the longest gestation period of any mammal to produce a single offspring and, therefore, have the lowest maximum finite rate of population increase of all mammals. As such, their population growth rate cannot compete against the dramatic decrease of their population due to poaching (Bennett, 2014; Harvey, 2015). For example, it was estimated that poachers illegally killed 7.4% of the total African elephant population in 2011 (UNEP et al., 2013). The natural annual growth rate of a healthy elephant population has been estimated between 5% to 6%, with a theoretical maximum of 7% (UNEP et al., 2013). It was found that “illegal off-take in 2011 indicates an unsustainable trend of elephants being killed faster than they can breed. If this trend continues over a number of years, current poaching levels will lead to significant population declines across much of the continent” (see Figure 6 on next page) (UNEP et al., 2013, p. 33).

Furthermore, the illicit ivory trade threatens African elephant populations by removing the best specimens while skewing of the sex and age ratio of the population (Mondol, Mailand, & Wasser, 2014; UNEP et al., 2013; van Kooten, 2008; Wittemyer et al., 2014). For example, van Kooten (2008) reports that the average tusk weight and average age of African elephants have decreased since the 1970s. This is a result of the current elephant population being younger due to older animals with larger tusks (best specimens) being targeted by poaching.

The second environmental impact of poaching is the reduction or removing of elephant populations from the African ecosystems they vitally support. For example, Wasser et al. (2010) argues that decreased elephant populations in Central Africa, who are the primary seed disperser
of large trees in the region, could “substantially affect long-term viability of the second most important carbon capture forests in the world” (p. 1331). Increased poaching to supply the illicit ivory trade is threatening certain elephant populations with impending extinction as well as is threatening to disrupt vital ecosystems. This disruption additionally poses a threat to the other species and humans dependent on the health of these ecosystems. This is related to the next discussed implication of the illegal wildlife trade, its social and economic impacts.

![Percentage of elephants illegally killed in Africa](image)

**Figure 6.** Percentage of elephants illegally killed in Africa. The figure shows that the annual total percentage of illegally killed African elephants (calculated with data from MIKE monitoring sites) surpassed the off-take sustainability limit, meaning it has exceeded the total population growth rate of African elephants, since 2010. (Source: UNEP et al., 2013, p. 33)

**Social and economic impacts.** The illegal wildlife trade threatens social and economic structures, particularly in the supply regions where poaching occurs. As previously mentioned, the majority of the supply regions for the illegal wildlife trade are in developing countries. The illegal wildlife trade impedes the sustainable development of these countries by threatening or preventing the social and economic structures necessary for them to progress (Nellemann et al.,
2014; WWF & Dalberg, 2012). Nellemann et al. (2014) found the illegal wildlife trade involves “a complex combination of weak environmental governance, unregulated trade, loopholes and laundering systems used to conduct serious transnational crime, and undermining government institutions and legitimate business” (p. 97; WWF & Dalberg, 2012). WWF and Dalberg (2012) argue that corruption is necessary for the illegal wildlife trade to thrive, but it amounts to economic loss for the country (WWF & Dalberg, 2012). Corruption reduces rule of law, weakens civil engagement and trust in the state, threatens good governance, and impedes financial transparency. Thus, it also weakens macroeconomics, financial stability, and development of legitimate business within the country (WWF & Dalberg, 2012).

Furthermore, Haken (2011) argues that illegal wildlife trade traffickers are invested in preventing these supply countries from socially and economically developing. Criminal organizations exploit these structures within developing nations to enable their poaching efforts. Criminals exploit food insecurity and inequality to attract or exploit impoverished locals for poaching as well as exploit poor governance and corruption in order to facilitate their poaching activities (Haken, 2011; Lawson & Vines, 2014; Rosen & Smith, 2010). Criminal organizations sell the poached wildlife or their products through the illegal wildlife trade to fund their criminal activities (Haken, 2011). This undermines a country’s natural resource management and robs the country of valuable assets (Rosen & Smith, 2010; WWF & Dalberg, 2012). Also, it leads to great economic loss for developing nations while the instigated violence and crime by these criminal organizations further hinders or reverses the social development, economic growth, and tourism within these nations (Lawson & Vines, 2014; Rosen & Smith, 2010).

Finally, the illegal ivory trade impacts social and economic development because its “unregulated trade and consumption of wildlife can spread viruses and diseases, endangering
local species and food supplies, introducing harmful invasive species that generate ecological and further economic losses, and facilitating species-jump of disease from animals to humans” (also see section, Global Health Impacts) (Felbab-Brown, 2011, p. 6).

Overall, the illegal wildlife trade is a national resource theft that: (a) deteriorates social structures and sustainable development while (b) it imposes crime, violence, and corruption; (c) threatens local industries, such as ecotourism and wildlife safari tourism; and (d) economically and socially devastates the local communities dependent on these robbed species for food and income as well as threatens their health. In addition to undermining social and economic development, the illegal wildlife trade undermines national and international authorities thereby threatening national and international security (Warchol, Zupan, & Clack, 2003). Before discussing this security impact, the social and economic impacts of the illicit ivory trade are overviewed.

**Social and economic impacts of the illicit ivory trade.** The illicit trade of ivory threatens the social and economic stability and development of African elephant range states. Duffy and St. John (2013) studied the illicit elephant ivory and rhino horn trades in Africa. They found that the illegal ivory trade, corruption, poverty, and violence are all linked. These linked factors threaten the social and economic stability of the African elephant range states by weakening rule of law, undermining good governance, and causing physical and economic insecurity leading to further widespread poverty (Warchol, Zupan, & Clack, 2003; WWF & Dalberg, 2012). It inhibits the country’s future development as well as reverses its current progress.

Perpetrators of the illegal ivory trade use and rely on corruption. Bennett (2014) explains that corruption allows for the laundering of illegal ivory through legal conduits. For example, perpetrators exploit corrupt government officials and underpaid wildlife rangers by bribing them:
(a) to overlook illegal activities of poaching, trade, and transport and (b) to obtain falsely altered and certified necessary paperwork and permits (Bennett, 2014; Bulte, Damania, & van Kooten, 2007; Duffy & St. John, 2013; UNEP et al., 2013).

Criminal syndicates also exploit impoverished locals with no alternative livelihood to illegally poach for them (Duffy & St. John, 2013). However, Bennett (2014) points out that the local poacher receives a highly disproportionate price for the ivory compared to the price paid by consumers at the end of the supply chain. As such, local poachers are not gaining a legitimate and secure income necessary for improved economic development.

In areas of conflict, organized criminal syndicates commonly use the illicit trade of ivory and rhino horn to fund their operations and fuel further violence (Duffy & St. John, 2013). Continued conflict and violence undermines good governance and law enforcement while robbing the country of its natural resources (Duffy & St. John, 2013; Lawson and Vines, 2012). It also decreases or prevents the potential economic revenue from ecotourism available to these countries and leaves locals further inclined to turn to poaching because they have no alternative livelihood and face severe threats to their physical security (Akella & Allan, 2012; Duffy & St. John, 2013; Lawson and Vines, 2012; Nellemann et al., 2014; WWF & Dalberg, 2012).

Overall, the illegal wildlife trade’s association with corruption, poverty, and violence prevents the region from economically and socially developing. The illicit ivory trade’s association with violence and use by criminal syndicates to fund their illicit operation and activities is an example of how the illegal wildlife trade is, also, a threat to national and international security.

National and international security impacts. A major focus of the international community is the national and international security impact caused by the illegal wildlife trade.
This threat is a result of the illegal wildlife trade’s link to organized crime and involvement of militias, non-state armed forces, and terrorists (Lawson and Vines, 2012; Nellemann et al., 2014; UNEP et al., 2013). Lawson and Vines (2012) completed a report on the illegal wildlife trade that found it “erodes state authority and fuels civil conflict, threatening national stability and provoking substantial economic losses internationally” (p. ix). Additionally, these criminal syndicates are a corruptive force as they pay for or use violence to maintain impunity and undermine law enforcement (Akella & Allan, 2012). For example, heavily armed poachers have used violence against rangers and individuals guarding wildlife in order to poach the species. Poachers or wildlife traffickers have killed at least 1000 wildlife rangers in the last decade in thirty-five countries around the world (Nellemann et al., 2014).

The illegal wildlife trade is disturbingly linked to conflict regions, militia, terrorists, and non-state armed groups, particularly in Africa and Southeast Asia. These groups target developing or conflict regions with weak governance and poor capability to protect species as ideal locations to run their illegal wildlife trade operations, which fund their criminal operations and activities (Akella & Allan, 2012; Nellemann et al., 2014; WWF & Dalberg, 2012). Further, there has been an increasing trend of overlapping transnational organized crime operatives, such as criminal syndicates sharing the same routes for trafficking illicit wildlife products, humans, and illicit drugs (WWF & Dalberg, 2012). The illegal wildlife trade poses an alarmingly grave threat to national and international security as it funds and unites highly organized criminal organizations, including international terrorist groups. The illicit trade of ivory is one of the wildlife trades most often exploited by these criminal organizations (Akella & Allan, 2012; Nellemann et al., 2014; WWF & Dalberg, 2012). The impacts of this will be discussed next.
National and international security impacts of the illicit ivory trade. The large-scale movement of illicit ivory traded from Africa to Asia increasingly requires criminal organizations, illegal networks, and sophisticated techniques (Milliken, 2014). These organized criminal syndicates poach African elephants in order to sell their ivory within the illicit trade. Their criminal operation and activities, which are funded by this illicit trade, undermine national and international security.

Harvey (2015) argues that these criminal syndicates are adept at avoiding law enforcement and are extremely well resourced. Harvey (2015) provided an example of the scope of sophisticated methods of poaching syndicates. He states, that on March 15, 2012:

A foreign helicopter entered DRC [Democratic Republic of the Congo] airspace, and 22 elephants were killed by a marksman firing from the helicopter, killing the elephants with a single shot to the top of the head. While the actual slaughter was not witnessed, a Russian manufactured MI-17 troop-carrying helicopter was photographed in the vicinity at the same time. The helicopter was illegal and of unknown origin. (Harvey, 2015, p. 14)

Organized criminal syndicates, also, exploit factors of weak governance, corruption, conflict, and poverty in order to operate with relative impunity (Harvey, 2015; Lawson & Vines, 2012).

Additionally, militias, non-state armed forces, and terrorists have used illegal traded ivory and rhino horn to fund their operations and activities (Akella & Allan, 2012; Nellemann et al., 2014; WWF & Dalberg, 2012). For example, the Sudanese Janjaweed and the Lord’s Resistance Army have been connected to poaching elephants and illegally trading the ivory in order to fund their efforts. The “funds finance further illegal activity including linked transnational crimes, insurgency and political destabilization… [and] are fueling civil conflict in already unstable states, threatening the stability and security of states involved in all aspects of this trade and
beyond” (Lawson & Vines, 2012, p. 18). Nellemann et al. (2014) calculated the number of elephants that were poached for their ivory in Africa within the range of militia or non-state armed groups making the assumption that these groups poached the elephants. Their study then estimated the amount of poached ivory and the monetary value of ivory finding an estimated US $3.9 – 12.3 million per year could have been acquired by the criminal syndicates to finance their efforts (Nellemann et al., 2014). This is a significant resource for their illicit activities. Overall, the use of the illegal wildlife trade to fund criminal activity undermines national security of the African elephant range states where these criminal syndicates operate as well as threatens international security of countries impacted by their illicit activities. Related to the illegal wildlife and ivory trades’ national and international security impacts, the illegal wildlife trade is a major threat to global health security.

**Global health impacts.** The illegal wildlife trade, as a driver of disease emergence in humans, flora, and fauna, poses a major threat to global health. This is ironic because one of the high demands fueling the illicit trade is the untrue but falsely believed health benefits of certain wildlife products to offer sexual potency or a cancer cure (Felbab-Brown, 2011). This is separate from wildlife products used by traditional medicine with actual curative properties.

Research has found that the illegal trade of animals is a major conduit for the spread of zoonotic diseases increasing the potential for global pandemic outbreaks (WWF & Dalberg, 2012). “The One Health Initiative recognizes that some 70% of emerging or reemerging diseases are zoonotic—i.e., they can be transmitted from animals to humans” (Ratchford, Allgood, & Todd, 2013, p. 10). The illegal animal wildlife trade creates an environment for easy spread of these zoonotic diseases from animals to humans (Haken, 2011; Karesh et al., 2007; Ratchford, Allgood, & Todd, 2013). First, the illicit trade of live-specimen wildlife and their bushmeat...
creates close contact between illicitly traded species, humans, livestock, and native species (Rosen & Smith, 2010). Second, the illegal wildlife trade facilitates illicit cross-border flow and exposure without completing the required health and safety examinations in place to prevent pandemic disease spread or outbreak. Third, the presence of the illicit trade overlaps with some of the other influences of disease outbreak, including poverty, weak governance, and population growth (Haken, 2011; Karesh et al., 2007; Ratchford, Allgood, & Todd, 2013). Hence, the illegal wildlife trade facilitates the potential for spread of zoonotic diseases posing a severe global health threat with the possibility of causing pandemic disease outbreaks.

Furthermore, this global health threat of the illegal wildlife trade has been directly documented. “Avian Influenza (H5N1), Secure Acute Respiratory Syndrome (SARS), Heartwater Disease, and Monkeypox are primary examples of deadly diseases facilitated by illicit animal trafficking” (Campbell, 2012; Gómez & Aguirre, 2008; Haken, 2011, p. 13; Karesh et al., 2007; Rosen & Smith, 2010). For example, the 2003 SARS pandemic began in China and spread globally to 51 countries around the world (Rosen & Smith, 2010). The SARS pandemic was linked back to civets that were part of the illegal wildlife trade from Southeast Asia and spread the disease to humans in China. Rosen and Smith (2010) further comment:

The large number of illegal shipments originating in Southeast Asia is of particular interest since rapid population growth, high population density, and high biodiversity make this region a “‘hotspot’” for future emerging zoonoses. The presence of the illegal wildlife trade in a zoonotic disease “‘hotspot’” multiplies the risk that future emerging zoonotic diseases will spread internationally. Moreover, poor infrastructure in the region makes the prospect of disease outbreaks especially dangerous. (p. 29)

As the illicit ivory trade is not a live-specimen or bushmeat trade, it does not directly threaten
global health. However, it could potentially indirectly threaten global health.

**Global health impacts of the illicit ivory trade.** My review of the literature did not find a discussion of the potential global health impacts of the illicit ivory trade. The trade of ivory is not as threatening as live specimen and bushmeat trades because ivory cannot carry and spread disease. However, I would suggest further research be conducted on the potential indirect threat of the illicit ivory trade. For example, it is conceivable that an elephant poached for its ivory would be further poached for its bushmeat, whether by the ivory poachers or locals that discover the fresh carcass. Indirectly, ivory poaching could be linked with elephant bushmeat trade. The large African bushmeat trade does pose a threat to global health with its potential to spread disease (Felbab-Brown, 2011; Rosen & Smith, 2010; Wyler & Sheikh, 2008). Also, it is conceivable that the illicit ivory indirectly poses a global health threat by preventing the development or provision of needed healthcare through its deterioration of social institutions and systems as well as human security within African elephant range states.

In summary, each of the global threats of the illegal wildlife and ivory trades are not independent, rather they are interconnected. For example, the impact of the illegal wildlife trade as a driver of disease emergence is not limited only to global health. It also can cause devastating economic impacts. For example, the illegal trade led to the 2003 mad cow disease epidemic and caused an economic loss of two-thirds of the global meat trade, as well as, threatened the livelihood of many farmers (Karesh et al., 2007). As shown in Figure 7 (see on next page), WWF and Dalberg (2012) have created a visualization of the impacts and their interconnections. Finally, Elliott (2012) summarizes the impacts of the illegal wildlife trade as well as introduces the barriers of combatting it, which will be discussed next. Elliott (2012) states it is:

a serious crime that is not always taken seriously enough in the wider transnational
crime fighting community. It generates profits of billions of dollars for individuals and criminal networks, undermines environmental protection and sustainable development, robs governments of income, compromises the rule of law, fosters corruption, brings violence to local communities, and puts those who defend against this form of criminal activity in danger. (p. 99-100)

Due to the extensive detriment of the illegal wildlife trade, it is critical that it be effectively combatted in order to protect humans, wildlife, and the environment.

![Diagram showing interconnected global impacts of the illegal wildlife trade.](Source: WWF & Dalberg, 2012, p. 16)

**Figure 7.** Interconnected global impacts of the illegal wildlife trade. The figure shows that the four impacts of the illegal wildlife trade are not independent, rather interconnected posing an even greater threat to international development and emphasizing the need to combat the illegal wildlife trade. (Source: WWF & Dalberg, 2012, p. 16)

### Combatting the Illegal Wildlife Trade

This section of the historical background part of this chapter focuses on combatting the illegal wildlife trade, including the illicit trade of ivory. The recognition of the devastating impacts of this illicit trade has finally led the international community to take action to combat it, regardless of the many barriers making that not an easy feat. First, this section overviews the
barriers to effectively combatting the illegal wildlife trade. Also, a summary of the barriers to combatting the illegal ivory trade is included. This will be followed by a discussion of the efforts by the international community to combat the illegal wildlife trade both in general as well as specifically discussing the efforts to address the illicit ivory trade. Then, I narrow my focus to the most recent and largest collaborative effort by the international community to combat the illegal wildlife trade, namely the 2014 London Declaration on the Illegal Wildlife Trade (London Conference, 2014). This section concludes with an overview of the ivory stockpile management strategy the London Declaration calls the international community to use. Effective ivory stockpile management is the main interest of my master thesis and will be further explored in the literature review section of this chapter.

**Barriers.** The literature has identified five major barriers to combatting the illegal wildlife trade, related to both the supply and demand of protected wildlife and their products. These barriers support the continual growth of this high profit, low risk transnational crime. First, I will discuss the primary barrier, the high demand and price for protected wildlife and their products. Then, I will discuss each of these barriers: (a) limitation of CITES; (b) treatment of the illegal trade as a low-priority international issue; (c) challenging structures present in the regions supplying illicitly traded wildlife and their products; and (d) globalization. Finally, these barriers are not independent from each other but are interconnected posing a complex challenge to combatting the illegal wildlife trade (Elliott, 2012; Nijman, 2010). Before moving on to the international community’s efforts to combat the illegal wildlife and ivory trades, I will specifically summarize the barriers posing a challenge to combatting the illegal ivory trade.

**High demand and price for illicit wildlife and their products.** First, the main barrier to combatting the illegal wildlife trade is a highly demanding global market that is willing to pay
extremely high prices for illicit wildlife products (Akella & Allan, 2012; Nijman, 2010; WWF & Dalberg, 2012; Wyler & Sheikh, 2013). Akella and Allan (2012) found the worth of many illegal products from endangered wildlife species is more than their weight in gold. This incredible worth is driving this illicit trade’s classification as highly profitable for perpetrators. For example, “Asian demand is bringing rhinoceros to the edge of extinction, driving up the price of rhino horn in the black market, currently at around US $30,000 per pound (US $66,139 per kilogram) more than the value of gold and platinum” (Ratchford, Allgood, & Todd, 2013, p. 8-9). Or, “cut pieces of illegal ivory have been reported as selling for US $1,836 a kilogram in Vietnam” (Elliott, 2012, p. 92). Wyler and Sheikh (2008) explain that as consumer demand exceeds what the market can legally supply then the value of illegal wildlife and their products in the illicit market continues to increase. However, consumers are willing and capable to pay these exorbitant and rising prices thereby raising the prices does not necessarily reduce the demand. This makes the high demand within this illicit trade a challenging barrier to overcome because it is difficult to reduce demand.

Demanding consumers remain willing to pay exorbitant prices and not lessen their demand because use of wildlife and their products are deeply rooted in history, culture, and tradition, particularly in Asia (Akella and Allan, 2012; Gao & Clarke, 2014). For example, Chinese Traditional Medicine has been used for over 3,000 years to maintain good health, vitality, and longevity (Akella and Allan, 2012). This medicine focuses on preventative use of natural plant, animal, and mineral-based materials and remains in practice today by hundreds of millions of people (Felbab-Brown, 2011). Further, consumers may hold traditional Chinese perspectives such as: (a) wild animals are to be exploited by humans and (b) consumption of wildlife is sign of one’s status and prestige (Felbab-Brown, 2011). More importantly, this is not
to argue Chinese and other Asian culture and practices are the scapegoat. Rather, it is presented as an example of how deeply-rooted cultural practices pose a challenge to changing behavior necessary when combatting the illegal wildlife trade through demand reduction strategies. A historical practice, such as use of wildlife products as a cure or treatment of a disease, is not capable of being stopped overnight and must be respected when finding a sustainable solution to protect both humans, endangered wildlife, and traditional cultures (Akella and Allan, 2012).

Additionally, there is an increasing amount of wildlife consumers who are also increasingly capable of paying the exorbitant prices for highly demanded illicit wildlife and their products. This is a result of the rising population and economic growth in Asia providing more individuals with affluence and disposable income (Akella & Allan, 2012; Nijman, 2010). As noted earlier in the chapter (see section, demand for illegal wildlife and their products), there are a number of influences that drive this high demand for illicit wildlife and their products including cultural traditions, globalization, buying power, and conspicuous consumption.

Although there is a very high demand for illegal wildlife and their products that fuels this lucrative illicit trade, it is only one of the barriers to combatting this illegal trade. The other barriers to combatting the illegal wildlife trade relate to the supply side of this illicit transnational crime. Before discussing the other barriers, it is important to once again reiterate the interconnection of all of these barriers (Nijman, 2010). They simultaneously influence or reinforce each other to further facilitate the illegal trade of wildlife and their products.

**Limitations of CITES.** The second barrier to combatting the illegal wildlife trade after reviewing the literature is the limitations of the Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES]. It is the main international regulatory mechanism of the transnational commercial trade of wildlife and their products. Positively, CITES is ratified,
accepted, or approved by 180 countries or Parties making it the largest multilateral agreement for species conservation and regulates the trade of more than 30,000 species (Abensperg-Traun, 2009; CITES, n.d.; Lawson & Vines, 2014). However, Holden (1979), Pires and Moreto (2011), Nowell (2012), and Challender, Harrop, and MacMillan (2015a) have all evaluated CITES as a regulation measure. They identified limitations of CITES that threaten the protection of the species on its appendices. The limitations include:

- it is only a recommended framework that absolutely depends on the voluntary ratification, implementation, and enforcement of its convention by its Parties within their national policies and laws. Its effectiveness is rendered by its inability to guarantee its regulations are implemented and enforced (Abensperg-Traun, 2009; Nowell, 2012);

- it only regulates the international commercial trade of species meaning domestic trade of wildlife and their products is unregulated and, often, continues to threaten the species’ survival (Pires & Moreto, 2011).

- it only recommends regulation and enforcement efforts rather than implementation of all strategies necessary to most effectively combat the illegal wildlife trade, such as also decreasing consumer demand and increasing alternative economic opportunities for rural, poor populations (Challender, Harrop, and MacMillan, 2015a);

- its classification of species into its appendixes may not be necessarily accurate because the classification may be influenced by politics and emotions rather than scientific data and the classification may be based on scientific data from Parties failing to accurately determine the true status of the species’ population and the threats to its survival (Challender, Harrop, & MacMillan, 2015a).

Related to CITES not being implemented or enforced by its Parties, the third barrier to
combatting the illegal wildlife trade is the historical lack of the international community to address the illegal wildlife trade as a serious transnational crime.

**Non-prioritized international issue.** Third, the international community has treated the illegal wildlife trade, until recently, as a low priority international issue. This has created a substantial barrier, which continues to challenge efforts to universally and effectively combat this illicit trade. The illegal wildlife trade has historically been seen as an environmental issue rather than as a higher priority transnational crime or justice issue. Therefore, many local, national, and international political, law enforcement, and security organizations have not given it the attention it needs to be addressed (Akella & Allan, 2012; Ratchford, Allgood, & Todd, 2013; Warchol, Zupan, & Clack, 2003; WWF & Dalberg, 2012). Additionally, Elliott (2012) reports that national laws on the prosecution of poaching, smuggling, or illegal logging seldom sentence perpetrators to four or more years of deprivation of liberty, a requirement that would establish them as serious crimes defined by the international United Nations’ Convention Against Transnational Organized Crime. Although prioritization of this issue has shifted, the international community’s historical lack of considering the illegal wildlife trade as a non-prioritized international issue has allowed it to increasingly grow. The fourth barrier also facilitates this growth with the challenging structures in supply regions creating more barriers to combatting the illicit trade of wildlife and their products.

**Challenging structures in the regions supplying the illicit trade.** The fourth barrier to combatting the illegal wildlife trade is the challenging structures in the regions supplying the wildlife and their products entering the illicit trade. Supply regions are heavily concentrated within developing countries, which have challenging structures including: (a) often being a biologically diverse and rich environment home to many species, often including the highly
demanded endangered species within this illicit trade; (b) failing to protect wildlife within their national or local legislation; (c) having poor law enforcement or capacity to protect wildlife; (d) having high corruption and weak governance; and (e) having wide-spread poverty facilitating economic-driven poaching (Ratchford, Allgood, & Todd, 2013; Wyler & Sheikh, 2008; Wyler & Sheikh, 2013). It is necessary to explain how these challenges interact to understand them as a major barrier to combatting the illegal wildlife trade.

Since supply regions are often in areas of rich biodiversity, including endangered and endemic species, wildlife traffickers often have access to a wide variety of highly demanded wildlife (Haken, 2011; Ratchford, Allgood, & Todd, 2013; Rosen & Smith, 2010). Additionally, perpetrators can exploit the weak structures within these developing nations to facilitate their illicit activities (Haken, 2011; Ratchford, Allgood, & Todd, 2013; Rosen & Smith, 2010). First, these regions often: lack wildlife protection legislation; lack resources, training, or capacity to properly monitor and enforce against the illegal trade; and have minimal punitive action against perpetrators (Elliott, 2012; Nellemann et al., 2014; Nowell, 2012; Wyler & Sheikh, 2008). For example, Milliken (2014) reported that between 2009 and 2013 only 12% of the 76 cases of illegal ivory seizures reported to ETIS had indicated a suspect was arrested. It is uncommon for successful investigations or arrests to be made, and, if they are, it is uncommon for them to be convicted (Milliken, 2014).

Related to weak legislation and enforcement, Elliott (2012), the International Fund for Animal Welfare (Ratchford, Allgood, & Todd, 2013), and Wyler and Sheikh (2013) found that large unregulated domestic commercial trades of wildlife and their products in these regions creates even greater opportunity for illicit activity because products are traded illicitly through legal conduits. This is possible due to developing countries often also having: weak governance,
poor law enforcement, and corruption (Haken, 2011; Karesh, Cook, Gilbert & Newcomb, 2007; Ratchford, Allgood, & Todd, 2013; WWF & Dalberg, 2012). Criminals use forged paperwork and bribe corrupt officials to illicitly trade wildlife through these legal conduits as well as pay to have their convictions corruptly dropped if caught (Wyler & Sheikh, 2013). Furthermore, vast corruption within these countries leads to weak rule of law, weak political accountability, and physical and economic insecurity, which results in widespread poverty (WWF & Dalberg, 2012).

Poverty is another challenge within this barrier to combatting the illegal wildlife trade. Criminal syndicates can exploit impoverished law enforcement and wildlife officials through bribing. Additionally, local individuals, often whom have no other economic alternative while grasping a deep knowledge of the area, become involved in illicit poaching as a livelihood or become coerced into it by larger criminal syndicates (WWF & Dalberg, 2012; Wyler & Sheikh, 2008). Wyler and Sheikh (2008) reiterate this point but argue for the importance of differentiating between locals poaching to maintain cultural or traditional hunting practices to generate a subsistence-level income or livelihood in a changing world compared to commercial poachers and crime syndicates poaching to make an economic profit. Although poverty may motivate poaching, poverty should not be blamed for causing poaching; if high paying and demanding consumers did not exist, impoverished individuals would not be economically motivated to unsustainably exploit wildlife (Duffy & St. John, 2013).

Overall, these challenges allow poachers and wildlife traffickers to operate with relative impunity and view the supply chain as a low-risk operation. This is combined with the existing high demand and high illicit profits within the trade. Therefore, this barrier results in the growing, lucrative illegal wildlife trade being recognized as a high-profit, low-risk transnational crime by perpetrators (Elliott, 2012). More alarming, the classification of this transnational crime
as high-profit, low-risk motivates involvement of organized crime syndicates (Wyler and Sheikh, 2013, p. 1). Additionally, these supply regions do not only attract wildlife trafficking operations but also drug and human trafficking operations. This has resulted in parallel trafficking of the illegal wildlife trade with other transnational crimes (Elliott, 2012). Research has shown that connections between the illegal wildlife trade, illicit drug trafficking, and international money laundering exist. Examples of these parallel trafficking incidences include traffickers using the same transit routes for drugs and wildlife products, at times even packaged together, or cases of money laundering with payments of illicit wildlife or their products in exchange for drugs (Elliott, 2012; Warchol, Zupan, & Clack, 2003; WWF & Dalberg, 2012; Wyler & Sheikh, 2013).

In summary, the challenging structures common in many supply regions facilitate the illegal wildlife trade and pose a major barrier to it being effectively combated, especially when it encourages transnational criminal organizations to become heavily involved.

**Globalization.** Finally, globalization is a major barrier to combatting the illegal wildlife trade. Primarily, the impact of globalization is seen through the internet becoming a major driving force behind the growth of the illegal wildlife trade. The literature argues that the unprecedented level of illegal wildlife trade facilitated by international online trade is the leading threat to the protection of many species and their survival, particularly those traded as exotic pets (Derraik & Phillips, 2010; Hastie & McCrea-Steele, 2014; Ratchford, Allgood, & Todd, 2013; Wyler & Sheikh, 2008). The internet has facilitated greater access to the illicit trade for consumers by allowing easy, cheap, and discrete illicit sales and purchases of protected wildlife and their products (Akella & Allan, 2012; Derraik & Phillips, 2010; Hastie & McCrea-Steele, 2014; Wyler & Sheikh, 2008). The internet has also created new challenges for law enforcement to combat the trade because it requires entirely different approaches (Akella & Allan, 2012;
Derraik & Phillips, 2010; Hastie & McCrea-Steele, 2014; Wyler & Sheikh, 2008). Furthermore, the actions to address, regulate, and protect against the online sale and purchase of illegal wildlife and their products is a relatively new effort (Akella & Allan, 2012). For example, eBay, a U.S. based global online auction website, only banned the sale of ivory on its website starting in 2009 (Derraik & Phillips, 2010, p. 1477).

In other regards, the influence of globalization as a barrier is recognized in the opening and rapidly growing Asian economies, such as China and Vietnam, and the increased access of remote or isolated regions to markets following the building of infrastructures and roads (Akella & Allan, 2012; Felbab-Brown, 2011; Suárez et al., 2009). Growing Asian economies have led to greater demand for illegal wildlife and their products as well as have led to greater individual purchasing power and consumption. For remote communities with new access to markets, there is an increase shift from their once sustainable personal sustenance poaching to economic-based poaching of wildlife, such as the poaching of wildlife to sell as bushmeat at the markets rather than eat (Suárez et al., 2009). Overall, globalization has in many ways facilitated the expansion of the illegal wildlife trade.

These five interconnected barriers of the illegal wildlife trade create major challenges to effectively combatting it. For each illegally traded species or their products, a unique set of barriers to combatting its illicit trade exists involving all or some of these general barriers.

Next, I provide an overview of the major barriers to combatting the illegal trade of ivory.

**Summary of the barriers to combatting the illicit ivory trade.** The major barriers to combatting the illicit ivory trade exemplify some of the general barriers to end the illicit wildlife trade as a whole. Specifically, these barriers are as follows:
• An extremely high demand for ivory with consumers willing to pay exorbitantly high prices. However, the prices of ivory are unique as they are relatively inelastic, meaning that the ivory market is not price sensitive nor are the consumers willing to accept substitutes regardless if it requires illicit purchase. Inelastic demand and lack of acceptable substitutes provides increasingly high return for illegal ivory traders from the high prices paid for illicit ivory. The lack of accepting substitutes relates to a long history of cultural affinity, which also poses a difficult and multi-generational process for successfully reducing the demand for ivory and combatting the illicit ivory trade. (Conrad, 2012; Gao & Clark, 2014; Harvey, 2015)

• The limitations of CITES prevent it from effectively protecting African elephants because of what Conrad (2012) calls a “perfect storm.” She identified five factors when combined cause the trade ban to instead threaten the species it seeks to protect, which is the case for African elephants. The five combined factors therefore threatening African elephants are: a high demand for ivory; a strong cultural affinity for ivory; ambiguous property rights (elephants existence on public lands causes an economic tragedy of commons causing poachers to help themselves before their “neighbor” does); human-elephant conflict causes negative incentives for locals to conserve the species; and inadequate enforcement of the trade ban. These combined factors create a major barrier for CITES to protect African elephants as well as for effective combatting of the illegal ivory trade. (Conrad, 2012)

• The challenging structures commonly found in many African elephant range states, which are primarily developing countries, are lack of political will, corruption, weak governance, poor or lacking law enforcement capacity and punitive action, conflict, and
poverty (Conrad, 2012; Duffy & St. John, 2013; Warchol, Zupan, & Clack, 2003; WWF & Dalberg, 2012). The high demand for ivory along with the weak enforcement and minimal punitive action for perpetrators cause the illicit ivory trade to be characterized as a high-profit, low-risk illicit trade. This has attracted large criminal organizations, including an international terrorist group, to use the trade to fund their activities. These challenging structures and the consequences of them pose a major barrier to combatting this illicit trade.

- There are large legal domestic ivory trades in Africa and Asia as well as a large online auction market for ivory in China, which are all used by perpetrators to traffic illegal ivory through these legal conduits (Gao & Clark, 2014; Vira, Ewing, & Miller, 2014; UNEP et al., 2013). This is a barrier to combatting the illicit ivory trade as it shows the limitation of CITES to protect species from overexploitation for domestic ivory trades and shows the role of globalization in expanding the illicit marketplace.

These barriers are also interconnected thereby posing an even greater challenge for effectively combatting the illegal ivory trade.

In summary, the barriers to combatting the illegal wildlife trade, including the illicit trade of ivory, show the grave challenges to eradicating this trade. However, they also emphasize the dire need to address this global issue. Together these barriers have identified this transnational crime as an enticing high-profit, low-risk endeavor for perpetrators (Elliott, 2012; Nijman, 2010). Since the general illegal wildlife trade and the illicit ivory trade are continuing to grow, it is evermore important to effectively combat these trades and their negative global implications. Understanding these barriers and their interconnections is critical in order to design targeted approaches to successfully address this illicit transnational crime. Next, I will summarize the
international community’s current efforts to combat the illegal wildlife and ivory trades.

**Efforts by the international community.** Considering the devastating impacts of the illegal wildlife trade, it is crucial that this illicit trade is effectively combatted. The first effort was to gain international consensus that the illegal wildlife trade was a serious issue that needed addressed. Both international intergovernmental and non-governmental organizations, supported by the findings of academia and research studies, played a significant role in creating the awareness of the illegal wildlife trade and its impacts. Notably, the major international intergovernmental organizations were the Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES], the UN Commission on Crime Prevention and Criminal Justice, the Economic and Social Council, the UN Security Council, UN General Assembly, INTERPOL, and the World Customs Organization among others (Nellemann et al., 2014). While, key international non-governmental organizations were the International Fund for Animal Welfare [IFAW], the International Union for Conservation of Nature (also known as World Conservation Union)[IUCN], WildAid, Wildlife Alliance, the Wildlife Trade Monitoring Network [TRAFFIC], and the World Wide Fund for Nature (also known as World Wildlife Fund)[WWF] (Rosen & Smith, 2010). The international community has recently prioritized this issue and begun efforts to combat the illegal wildlife trade.

Before the intergovernmental and non-governmental organizations convinced the international community to prioritize combatting the illegal wildlife trade, they had to bring attention to key species impacted by it and show how the illicit trade of them or their products posed a global threat. Elephants were one of these key species. The same organizations listed above and their programs have played a major role in addressing the illegal ivory trade as well as gaining the support of the international community to support these efforts. As a result, specific
actions, including monitoring mechanisms and action plans, have been implemented to effectively combat the illegal ivory trade and elephant poaching.

CITES implemented two monitoring mechanisms after the elephant trade ban in 1989. The Monitoring the Illegal Killing of Elephants [MIKE] Program was established in 1997 (UNEP et al., 2013). It is a standardized monitoring system that measures trends of illegally killed African and Asian elephants. It collects data from its elephant monitoring sites within African and Asian range states and publically disseminates the information. This information shows trends that help inform decision-making regarding the elephant population. Similarly, the Elephant Trade Information System [ETIS] monitors the illegal trade by tracking ivory confiscation occurrences (date and location) and amounts of confiscated illegally traded ivory (UNEP et al., 2013). Both of these monitoring mechanisms collaborate with the IUCN African and Asian Elephant Specialist Groups that operate the African and Asian Elephant Databases. These databases monitor and collect data on the total number and location of elephants within both the Asian and African elephant populations (IUCN/AfESG, 2016; UNEP et al., 2013). These monitoring mechanisms showed the international community, particularly in African elephant range states, that the illegal ivory trade and poaching to supply it were a serious issue that needed addressed.

Additionally, in 2010, the African Elephant Action Plan was created and adopted by the 38 African elephant range states following recommendations by CITES (UNEP et al., 2013). The action plan identified eight priority objectives for the range states to collectively implement in order to protect African elephants. In order to achieve these objectives, African elephant range states can request funds for their related activities from the African Elephant Fund (UNEP et al., 2013). The fund was created in 2011 and is financed by members of the international
community, who were now convinced and willing to prioritize efforts to combat the illegal trade of ivory and other wildlife products.

Convinced of the proven global implications of the illegal wildlife trade, the international community has collectively acted to address and combat the illegal wildlife trade. First, the international community created a collaborative international consortium. The International Consortium on Combatting Wildlife Crime [ICCWC] was founded in 2010 (WWF & Dalberg, 2012). The ICCWC is comprised of the CITES Secretariat, INTERPOL, WCO, United Nations Office on Drugs and Crime, and the World Bank (Elliott, 2012). With its mission to have wildlife crime perpetrators face formidable and coordinated responses by the law, it provides support to national law enforcement agencies and regional networks to promote better and greater enforcement of the illegal wildlife trade (Elliott, 2012; UNEP et al., 2013). Furthermore, it encourages and ensures collaborative efforts by the international community to combat the illegal wildlife trade (WWF & Dalberg, 2012). International collaboration is critical. Otherwise, there is the risk of committing “both failures of omission – when opportunities for synergy and cohesive action across agendas are missed and failures of commission – when activities designed to meet one agenda’s objectives unintentionally undermine efforts to reduce wildlife crime” (Akella & Allan, 2012, p. 5).

The next major action by the international community was to hold multiple important United Nations conferences and high-level political dialogues to discuss the illegal wildlife trade and propose ways to address it (Nellemann et al., 2014). These occurred in New York (September 2013), Botswana and Paris (December 2013), London (February 2014), and Dar es Salaam (May 2014) (Nellemann et al., 2014). At these events, the international community recognized illegal wildlife trade as “a threat to all the three pillars of the United Nations – human
Rights, peace and development” (Messone & Wittig, 2013, p. 2). With an acknowledgment of the full scope of the devastating impacts of the illegal wildlife trade to the environment, social and economic development, national and international security, and global health, the international community was seriously motivated to actively combat it. Previous efforts to combat the illegal wildlife trade were focused on conservation and protecting wildlife (WWF and Dalberg, 2012). However, the illegal wildlife trade is not, nor ever really was, simply a conservation or animal welfare issue (Ratchford, Allgood, & Todd, 2013). With the far-reaching impacts of the illegal wildlife trade, it was even more important to develop effective, comprehensive strategy to combat the illegal wildlife trade.

Following these meetings, the international community outlined a comprehensive strategy for combatting the illegal wildlife trade. The research field argued “a global and holistic response needs to be implemented to support national, regional and international efforts by strengthening and synchronizing actions targeting coherent environmental legislation, poverty alleviation and demand reduction” (Nellemann et al., 2014, p. 4). With an understanding and an agreement on the need for a collective approach, the international community accepted the 2014 London Declaration on the Illegal Wildlife Trade (London Conference, 2014). This collective approach to combat the illicit trade would help to eliminate its devastating global impacts to the environment, development, security, and health.

The 2014 London Declaration on the Illegal Wildlife Trade. The London Declaration on the Illegal Wildlife Trade [London Declaration] is the leading cooperative, collective approach to combat the illegal wildlife trade by the international community (London Conference, 2014). In February 2014, world leaders from over 40 nations along with representatives from major international organizations collaboratively met for the London
Conference on the Illegal Wildlife Trade (Lawson & Vines, 2014). They agreed upon a declaration outlining a strategy to combat the illegal wildlife trade. The London Declaration called for an urgent and decisive collective action to address the illegal wildlife trade and the poaching fueling it (London Conference, 2014). Further, it called for the international community to act together through effective cooperation. The declaration outlined three main strategies: (a) eradicate the high demand for wildlife and their products; (b) strengthen law enforcement and capacity to enforce; and (c) support the development of sustainable livelihoods for communities affected by wildlife crime (Duffy & Humphreys, 2014; Kasane Conference, 2015; Lawson & Vines, 2014; London Conference, 2014). Furthermore, the declaration argues that the use of united, collaborative efforts encompassing all of its three strategies is the most effective way to combat the illegal wildlife trade (Kasane Conference, 2015; London Conference, 2014).

The London Declaration has additionally guided the strategies and efforts to specifically combat the illegal trade of ivory. The current efforts to combat this illicit trade are implemented by actors at the international, national, non-governmental, and grassroots levels (Duffy & Humphreys, 2014). The efforts encompass all three strategies outlined by the London Declaration. This includes: (a) decreasing the high demand for ivory through demand reduction campaigns targeted to specific ivory consumers (Duffy & Humphreys, 2014; Harvey, 2015; Kasane Conference, 2015; Ramirez Corte, 2015); (b) increasing countries’ enforcement and capacity to enforce against African elephant poaching and the illegal ivory trade as well as protect their African elephant populations (Duffy & Humphreys, 2014; Kasane Conference, 2015); and (c) increasing social, economic, and community development of local communities sharing land with elephants (Duffy & Humphreys, 2013; Duffy & Humphreys, 2014; Harvey,
2015; Kasane Conference, 2015). An in-depth discussion of all the efforts to combat the illicit wildlife and ivory trades is beyond the capacity of my master thesis. However, in 2015, the international community met at the Kasane Conference to discuss and publish a review of progress of the London Declaration on the Illegal Wildlife Trade (Kasane Conference, 2015). This report provides an excellent summary of the international communities’ efforts (Kasane Conference, 2015).

Under each of its three strategies, the London Declaration outlines specific unanimous actions to be taken by the international community to combat the illegal wildlife trade. My master thesis narrowed its focus to one particular action of the London Declaration addressing the management of ivory stockpiles for effectively combatting the illegal ivory trade.

**Call for united action to destroy ivory stockpiles.** The London Declaration directly recognized the dramatic escalation in the rate of poaching of elephants and rhinoceroses as well as these trades’ expansive negative implications (London Conference, 2014). It further argues for active combatting of these illicit trades because it will strengthen the international community’s ability to effectively combat the trade of other endangered species while generally promoting sustainable consumption of all wildlife (Kasane Conference, 2015; London Conference, 2014).

One specific action of the declaration is of interest to my master thesis as it directly relates to combatting the illegal ivory trade. The London Declaration states, under its strategy to eradicate the market for illegal wildlife products, that the international community should:

endorse the action of Governments which have destroyed seized wildlife products being traded illegally; and encourage those Governments that have stockpiles of illegal products, particularly of high value items such as rhino horn or elephant ivory, to destroy them and to carry out policy research on measures which will benefit conservation.
Independent audits, or other means of ensuring transparent management, should be carried out prior to destruction. (London Conference, 2014, p. 5)

To clarify, an ivory stockpile is a collection of elephant ivory, raw (tusks) or worked (carved), legally owned and managed by a country, such as an African elephant range state (see Figure 8). The ivory may come into possession of the country from naturally deceased elephants, euthanized elephants due to human-elephant conflict, or illegally traded ivory confiscated in-country by authorities. Relevant to my master thesis, the London Declaration calls for all African elephant range states to destroy their ivory stockpiles in order to most effectively combat the illegal ivory trade (Kasane Conference, 2015; London Conference, 2014).

Figure 8. Legal government-owned ivory stockpile. The figure shows a portion of the ivory in Zimbabwe’s stockpile. (Source: http://www.cnn.com/2013/09/25/world/africa/Zimbabwe-elephant-poaching/)

Overall, the historical background provided in this chapter made apparent the serious global threat of the illegal wildlife trade and its devastating impacts. This is similarly the case for the illicit trade of ivory. Additionally, these complex illicit trades must be effectively combatted.
For the illegal ivory trade, the international community, particularly African elephant range states and countries with large ivory demand markets, must collectively act together to combat it. The London Declaration clearly expresses the importance of using united, cooperative actions in order to most effectively combat the illegal wildlife trade (Kasane Conference, 2015; London Conference, 2014). However, this is currently not being done by African elephant range states. Instead, they are using dichotomous ivory stockpile management strategies: (a) ivory stockpile destruction and (b) ivory stockpile sale (CITES, n.d.; Welch, 2015). This dichotomy of African ivory stockpile management threatens the necessary use of united, cooperative actions to most effectively combat the illegal ivory trade. This dichotomy will be further explored in my literature review.
Literature Review

The second part of this chapter is a review of the literature on the use of dichotomous ivory stockpile management strategies by African elephant range states. To briefly outline it, first, the two ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale – are described. Second, I provide an explanation for the use of these dichotomous strategies. Third, the intended outcome of these strategies is described. Although the two strategies share the same intended outcome, their effectiveness in achieving that outcome is widely debated. Next, I present a review of the literature arguing for and against ivory stockpile destruction as well as a review of the literature arguing for and against ivory stockpile sale. Finally, with an understanding of the historical background and after reviewing the related literature, my master thesis found a gap in the literature requiring further research. A discussion of this gap in the literature as well as a summary concludes this chapter.

Before continuing, it is necessary to nominally define pertinent terms used within my master thesis. The first important term is ivory stockpile. t’ Sas-Rolfes, Moyle, and Stiles (2014) identified two types of ivory stockpiles. They state:

Illegal stockpiles are privately held and clandestine—their location and extent is not known, but we assume that they consist mostly of raw ivory. This assumption is based on the dominance by weight observed of raw ivory being smuggled to Asia in seizures.

Legally held stockpiles consist of both raw and worked ivory (carvings) and are mostly owned by governments, having been sourced from natural mortality and culls in range states or from confiscations of illegal ivory in range, transit, or consumer countries.

(t’ Sas-Rolfes, Moyle, & Stiles, 2014, p. 69)

Considering their definition and the focus of my research study, I selected a more narrow
definition for ivory stockpile. As mentioned before, ivory stockpile is nominally defined by my study as a collection of ivory, raw (tusks) or worked (carved), legally owned and managed by a country. The ivory comes into possession of the country from naturally deceased elephants, euthanized elephants due to human-elephant conflict, or illegally traded ivory confiscated in-country by authorities.

Specifically, my thesis is focused on the ivory stockpiles legally owned and managed by African elephant range states. The nominal definition of African elephant range state used within my study is a country that has wild African elephants living within its national borders. African elephants are found in 35-38 countries or range states in sub-Saharan Africa with their ranges spanning across Central, Eastern, Western, and Southern Africa (Lemieux & Clarke, 2009; UNEP et al., 2013).

Management of Ivory Stockpiles

African elephant range states are responsible for managing and securing their legally owned ivory stockpiles. One of the ways ivory enters or reenters the illicit ivory trade is from unsecure, poorly managed ivory stockpiles (Neme, 2013; Harvey, 2015). Therefore, proper, secure management of their ivory stockpiles by African elephant range states is very important. Furthermore, cases of large portions of ivory going missing from ivory stockpiles owned and managed by African elephant range states are a serious concern (Neme, 2013). An unsecure, poorly managed ivory stockpile faces the threat of its ivory being raided by ivory traffickers or misappropriated by corrupt officials (Neme, 2013; Harvey, 2015). For example, in 2012, Zambia had three tons of ivory disappear from its stockpile while Mozambique had one ton disappear from its stockpile (Neme, 2013). In order to prevent ivory from these stockpiles supplying the illicit ivory trade, it is necessary to ensure proper, secure management of all legal government-
owned ivory stockpiles, especially those owned and managed by African elephant range states.

Therefore, my literature review focuses on the management of ivory stockpiles by African elephant range states. Currently, these range states use two dichotomous ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale. Next, I nominally define and discuss each strategy.

**Ivory stockpile destruction.** Within my master thesis, ivory stockpile destruction is nominally defined as the strategy of an African elephant range state to manage its ivory stockpile resulting in a publicized event where all or a portion of its stockpiled ivory is destroyed through burning or crushing it. There is an increasing trend to destroy ivory stockpiles by both African elephant range states and other countries around the world. Prior to 2011, only four ivory stockpiles had been partially or entirely destroyed including events by both African elephant range states and other countries (Welch, 2015). Whereas from 2011 through 2015, there have been fifteen recorded destructions of all or a portion of an ivory stockpile owned by African elephant range states and other countries (Welch, 2015). More specifically, the trend of increased destruction of ivory stockpiles applies directly to African elephant range states. Prior to 2014, three African elephant range states had conducted five ivory stockpile destructions, including: by Kenya in 1989, 1991, and 2011; by Zambia in 1992; and by Gabon in 2012 (Welch, 2015). With a total of five ivory stockpile destructions in the past two decades, there is an obvious increase in destruction rate with five destructions alone by African elephant range states in the two past years (Welch, 2015). These five destructions were in 2014 by Chad and in 2015 by Kenya, Ethiopia, Republic of Congo, and Mozambique (Welch, 2015).

The destruction of ivory stockpiles is done by either burning or crushing the ivory (see *Figure 9* on next page) (Neme, 2013). Prior to June 2013, most ivory stockpile destructions were
conducted by burning the ivory in large, publicized displays (Neme, 2013). However, it was criticized that burning the ivory may only destroy the outside of a tusk (Neme, 2013). If it did not destroy the entire tusk, it potentially meant the tusk could be smuggled back into the black market. Ivory stockpile destructions are now more commonly conducted by crushing the ivory during the event or after a burned display (Neme, 2013). Ivory is crushed into powder form, which guarantees that it cannot reenter the illicit trade.

![Figure 9. Ivory stockpile destruction. The figure shows the destruction of five-tons of illicit ivory from Kenya’s ivory stockpile during a public event in 2011. A separate report estimated that two tusks from an average elephant weigh approximately 10 kilograms (Minerva & Woomer, 2013). This means that the five tons of illicit ivory in the photo prior to being confiscated by Kenyan officials was poached from at least 450 killed African elephants. (Source: http://disappearing elephants.com/what-should-we-do-with-it/)](image)

**Ivory stockpile sale.** Within my master thesis, ivory stockpile sale is defined as the strategy of an African elephant range state to manage its ivory stockpile resulting in CITES listing its African elephant population as Appendix II and then the country sells a portion of its stockpiled ivory in a CITES-authorized one-off sale. The one-off sale of ivory stockpiles is a legal exception to the international ivory trade ban. This exception of regulated quota trade is
approved by CITES and allowed for countries with an Appendix II African elephant population. Recalling a brief history of the regulation of the international commercial trade of ivory is necessary to understand this ivory stockpile management strategy. Due to the major elephant poaching crisis of the 1970s and 1980s, CITES enacted the 1989 international ivory trade ban and listed all African elephants as Appendix I beginning in 1990 to protect the species from overexploitation (UNEP et al., 2013). Since 1990, multiple African elephant range states with well-managed, healthy elephant populations successfully petitioned CITES to downlist their elephant populations to Appendix II. CITES downlisted the elephant populations of Botswana, Namibia, and Zimbabwe in 1997 and of South Africa in 2000 (UNEP et al., 2013).

With Appendix II elephant populations, these four states are allowed under authorization by CITES to sell their ivory stockpiles in one-off auctioned sales approved by the convention to its approved buyers, currently Japan and China (Bulte, Damania, & van Kooten, 2007; UNEP et al., 2013). This exception requires that all revenue earned from the sale be used for elephant conservation. Since 1997, two joint one-off sales of ivory stockpiles have occurred. Despite being legal and infrequent, one-off sales of ivory stockpiles are extremely contentious issues (Bulte, Damania, & van Kooten, 2007, p. 613). The first sale was in 1999 with Botswana, Namibia, and Zimbabwe jointly selling portions of their stockpiles, roughly 50 tons, to Japan for approximately US $5 million (CITES, 2008). Since the sale was controversial, measures were taken to appease its non-supporters. The non-supporters feared it could increase poaching. Therefore, two mechanisms to monitor poaching and the illicit ivory trade were started. They are called the Monitoring Illegal Killing of Elephants Program and the Elephant Trade Information System (Bulte, Damania, & van Kooten, 2007).
The second sale occurred in 2008 with all four countries jointly selling portions of their stockpiles, roughly 102 tons, to China and Japan for over US $15 million (CITES, 2008). Again, there was a controversial debate over the sale because information from the monitoring mechanisms was inconclusive and the impact of the first sale on African elephants was uncertain. To once again appease non-supporters, the second sale occurred with the stipulation that no confiscated illicit ivory could be sold as well as it was agreed that a nine-year moratorium would begin preventing proposal for another sale until November 2017 (CITES, 2007). The moratorium would allow more time to better understand the impact, if any, of a sale on the African elephant population. Further, it is interesting to point out the countries that have Appendix II elephant populations or have petitioned for that are located in Southern and Eastern Africa, which is home to more than half of all elephants in Africa (Bulte, Damania, & van Kooten, 2007; CITES, 2007; CITES, 2008; UNEP et al., 2013). Thus, the use of ivory stockpile sale strategies potentially impacts (though it is unknown whether to be positive, negative, or no impact) a large percentage of the African elephant population.

Overall, these two strategies are used by African elephant range states to manage their legally owned ivory stockpiles. To summarize the usage of these strategies by country from 1990 through July 2015, seven out of the 35-38 African elephant range states have destroyed a portion of their ivory stockpiles at least once (UNEP et al., 2013; Welch, 2015). During this same time, four out of the 35-38 African elephant range states have sold a portion of their ivory stockpiles at least once. An additional three range states petitioned and were denied by CITES to downlist their elephant populations in order to sell their ivory stockpiles (UNEP et al., 2013; Welch, 2015). The remaining African elephant range states have chosen to store their ivory stockpiles without choosing to implement one of the two ivory stockpile management strategies. The
following section explores the reason behind African elephant range states currently using two
dichotomous ivory stockpile management strategies.

**Reason for Use of Dichotomous Ivory Stockpile Management Strategies**

The use of dichotomous ivory stockpile management strategies by African elephant range
states is a result of many economic and political incentives that strongly influence each country’s
chosen strategy. Some “want to be allowed to sell their stockpiled ivory (purportedly to fund
conservation initiatives), whereas others are committed to the destruction thereof” (Harvey,
2015, p. 17). The different strategies used are also influenced by the social, political, and
economic capacity of the county and the current situation within the country.

Some African elephant range states are incentivized to manage their ivory stockpiles
through use of an ivory stockpile destruction strategy. For example, range states in Western and
Central Africa have weak institutional mechanisms for conservation as well as limited resources
and capacity to fight poaching (Harvey, 2015). The result is concentrated elephant poaching in
these regions. These range states have a greater incentive to keep their elephants at an Appendix
I status to ensure their protection as well as greater economic incentive to destroy their stockpiles
of illegal ivory to eliminate expensive costs associated with securing it. For example, Tanzania
spent US $75,000 in 2010 to secure its 12,000-tusk stockpile (The East African, 2010, as cited in
Neme, 2013). Further, the 2008 one-off sale forbid sale of confiscated illegal ivory (CITES,
2007). This suggests to these countries that their stockpile may not have much value, as their
stockpiled ivory is primarily or entirely confiscated illicit ivory (Harvey, 2015). This supports
their choice to destroy their stockpiles rather than heavily invest in securing a stockpile that is
unlikely to bring future revenue. Also, it is highly unlikely their elephant populations will be
downlisted to Appendix II which is necessary for them to even be able sell their stockpile
(Harvey, 2015). Additionally, in my opinion, there may be political factors influencing a country’s decision to destroy its ivory stockpile. For example, destruction of an ivory stockpile could be a tool for the country to show its alignment with the international community and London Declaration. This, in turn, could increase its likelihood to secure needed support or aid from the international community.

Contrastingly, other African elephant range states are incentivized to manage their ivory stockpiles through use of an ivory stockpile sale strategy. For example, the four countries authorized to sell their stockpiles have relatively more secure, well-managed elephant populations (CITES, n.d.; Harvey, 2015). Therefore, they are politically and economically incentivized to sell their ivory stockpiles through CITES-authorized one-off sales and use the funds for continued conservation (Harvey, 2015). Also, these countries are economically incentivized to not allow the return of all African elephants to Appendix I to ensure their ivory stockpile sales can continue (Harvey, 2015). The ivory stockpiles of these four countries are much more valuable. Their stockpiles are not only supplied by confiscated illicit ivory. More importantly, they are supplied with ivory from naturally deceased or euthanized elephants within their large, well-managed elephant populations. This ivory can be legally sold in order to fund elephant conservation efforts. As these states have secure, well-managed elephant populations and an economically valuable stockpile, they are politically incentivized to exercise their statehood and right to choose how best to manage their ivory stockpiles, namely sale, while opposing interference by the international community (Bulte, Damania, and van Kooten, 2007). Overall, these discussions very briefly shows how some of the many influences and factors interact and lead to a country to select a specific ivory stockpile management strategy. Harvey reiterates, “these dynamics show just how complex the issue of securing a future with elephants
can be. Each policy decision on one variable has an impact on a number of other equilibria, none of which can be considered in isolation” (Harvey, 2015, p. 20).

Understanding why there is a dichotomy is important. As argued by my master thesis and supported by the London Declaration, African elephant range states must collectively use a united, cooperative ivory stockpile management strategy (London Conference, 2014). However, the “disparate interests of range states and their differing development priorities create a collective action problem” (Harvey, 2015, p. 19). Harvey (2015) suggests that a way to overcome this problem is to ensure all African elephant range states are necessarily compensated for their loss from unanimous use of a united strategy. With this assurance, all African elephant range states could collectively use a united ivory stockpile management strategy, which is necessary to most effectively combat poaching and the illegal ivory trade (London Conference, 2014). The challenge of solving how to achieve the unanimous use of a united ivory stockpile management strategy as well as the required in-depth analysis of all factors and influences causing this dichotomy is beyond the scope of my master thesis.

My master thesis recognizes that all of these considerations must be made before a united strategy of ivory stockpile management could be chosen and unanimously implemented by all African elephant range states. My study narrowed its focus to explore one of these many considerations: which strategy has the most effective outcomes for combatting the illegal ivory trade. Yet, I highly recommend that before a united strategy is chosen, the political and economic factors influencing its implementation be fully considered. Thus, the chosen ivory stockpile management strategy would not only be one that effectively combats the illegal ivory trade (the focus of my master thesis), but it, also, must be a strategy that can be effectively implemented unanimously by African elephant range states. I recommend further research be conducted on the
causes of the dichotomous strategy use by African elephant range states as well as explore which strategy could be effectively and unanimously implemented. Any findings from this area of research would complement the findings of my study. Relating back to my study, I will now continue to review the literature on current management of ivory stockpiles owned by African elephant range states.

**Intended Outcome of Ivory Stockpile Management Strategies**

Regardless of the use of dichotomous strategies, all African elephant range states are united in their intended outcome when using the two strategies. African elephant range states use the strategy – ivory stockpile destruction – to result in the conservation of their African elephant populations by clearly showing their state does not tolerate poaching nor tolerate the illicit trade of ivory (Harvey, 2015; Bennett, 2014). African elephant range states use the strategy – ivory stockpile sale – to also result in the conservation of their African elephant populations by funding efforts to protect elephants from being poached for their ivory (CITES, 2007; CITES, 2008). However, the effectiveness of these two strategies to achieve their shared outcome is widely debated.

**Debated Effectiveness of Each Ivory Stockpile Management Strategy**

The debated effectiveness and argument for use of a particular ivory stockpile management strategy is not new. It is also intertwined with the debate to either legalize or ban the international commercial trade of ivory. The debate over the effectiveness of destruction and sale of ivory stockpiles was initially raised prior to the first legal CITES-authorised one-off sale in 1999. Despite this initial debate, African elephant range states have continued to use the two opposing ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale.
This debate greatly escalated following the growing increase in elephant poaching in the mid-2000s and another legal one-off stockpile sale in 2008. Again, the two strategies remain used today and the debate continues. On one hand, the international community has been increasingly pushing for destruction of ivory stockpiles and directly called for use of this strategy in its London Declaration on the Illegal Wildlife Trade (London Conference, 2014; t’ Sas-Rolfes, Moyle, & Stiles, 2014). On the other hand, the international community contradicts itself by continuing to allow CITES-authorized one-off sales of ivory stockpiles by four African elephant range states (CITES, 2007; CITES, 2008). This contradiction as well as the use of dichotomous ivory stockpile management strategies by African elephant range states is likely a result of the conflicting research and literature supporting and rejecting both of these strategies.

Following is a summary of the arguments within the literature for and against ivory stockpile destruction by African elephant range states. After, the arguments within the literature for and against ivory stockpile sale by African elephant range states will be reviewed.

**Arguments for ivory stockpile destruction.** Intending to address the current poaching crisis in Africa supplying a growing illegal ivory trade, there has been an increased number of ivory stockpile destructions as well as an international call for all countries to destroy their ivory stockpiles (Kasane Conference, 2015; London Conference, 2014; Welch, 2016). Further, influential governments have developed international policies on the management of ivory stockpiles. For example, the United States of America calls for “all countries to destroy stocks of illegal, confiscated ivory” (t’ Sas-Rolfes, Moyle, & Stiles, 2014, p. 63). Ivory stockpile destruction is argued by its proponents to conserve the elephant population through decreasing the illegal ivory trade and elephant poaching by: (a) creating a zero-tolerance message against poaching and illicit trade of ivory with international attention; (b) by preventing stockpiled ivory
from entering the illicit trade; and (c) by showing a consistent effort to combat the illegal ivory trade. The literature explaining these arguments will now be reviewed. This will be followed by a summary of counterarguments against the destruction of ivory stockpiles.

**Zero-tolerance message with international attention.** The first argument for ivory stockpile destruction is that it sends a powerful message to criminals that a country has zero tolerance towards elephant poaching and the illicit ivory trade through a large public display generating international attention (t’ Sas-Rolfes, Moyle, & Stiles, 2014; Welch, 2015). “WWF also calls for ivory destructions to be backed-up with additional law enforcement efforts to combat poaching and trafficking, a stronger judicial process to end impunity for wildlife criminals, and enhanced local stewardship of natural resources” (Welch, 2015, para. 9). As such, ivory stockpile destruction expresses both a country’s zero tolerance for the illegal ivory trade and its intensified effort to combat the illegal trade (t’ Sas-Rolfes, Moyle, & Stiles, 2014; Welch, 2015). The zero-tolerance message deters elephant poachers, illicit ivory traders, and ivory consumers from their illicit activity within the illegal trade of ivory because the prioritized efforts by the country pose a greater risk of getting caught (t’ Sas-Rolfes, Moyle, & Stiles, 2014).

**Prevents stockpiled ivory from entering the illicit ivory trade.** The second argument for ivory stockpile destruction is that it prevents stockpiled ivory from entering or reentering the illicit ivory trade. Douglas-Hamilton (2013) argues for destruction of ivory stockpiles, particularly by countries that cannot protect their elephant population nor prevent elephant poaching within their borders. It may be argued that these countries in theory could best benefit from sale of their ivory stockpiles to fund improved conservation efforts and combatting of illegal poaching. However, Douglas-Hamilton (2013) notes that a country in this circumstance would never be able to sell its ivory stockpile. Since it has an unprotected, poorly managed
elephant population, the country would not be able to achieve the Appendix II listing of its elephant population necessary to be able to sell its ivory stockpile.

More concerning, the stockpiled ivory owned by these countries are at great risk of being stolen or corruptly entering the illegal ivory trade (Douglas-Hamilton, 2013). Bennett (2014) argues that keeping ivory stockpiles secure is expensive and challenging but unsecure, poorly managed ivory stockpiles are a significant source of illicit ivory entering or reentering the trade. For as long as ivory stockpiles exist, criminals will attempt and find ways to access them (Harvey, 2015). Criminals will target stockpiles held by African elephant range states that have weak governance, low capacity, and minimal funds to secure or properly manage them (Harvey, 2015). Also, the high corruption levels within many African elephant range states presents another risk of corrupt officials misappropriating stockpiled ivory to illicitly selling it for personal gain (Bennett, 2014).

Additionally, Harvey (2015) found that the great cost and effort for many African elephant range states to maintain and secure their ivory stockpiles occurs “largely through diverting scarce capital away from anti-poaching and anti-trafficking efforts” (p. 29). Therefore, ivory stockpile destruction also offers a way to remove the financial burden or inability to afford to secure stockpiles. Harvey (2015) argues for destruction of ivory stockpiles while recognizing the importance of identifying other funding streams for conservation and protection of African elephants. Further, Welch (2015) explains that WWF and TRAFFIC call for documentation and audits of all ivory stockpiles to further monitor and prevent the risk of ivory reentering the illegal ivory trade. CITES now calls for monitoring and inventory of stockpiles (Bennett, 2014). However, Bennett (2014) still argues that the only guarantee of the ivory not entering or reentering the illicit trade, whether by corrupt officials or criminal raids, is for ivory stockpiles to
be destroyed (Harvey, 2015).

*Shows a consistent, collective effort.* The third argument for ivory stockpile destruction is that it shows a consistent, collective effort to combat the illegal ivory trade by complementing the demand reduction and enforcement strategies. Douglas-Hamilton (2013) argues for the need of consensus rather than division by African elephant range states in efforts to protect African elephants from poaching. Harvey (2015) used an economic game theory model to determine the most effective and efficient way to combat African elephant poaching. Similar to Douglas-Hamilton’s call for collaboration amongst African elephant range states, Harvey’s model found collective, collaborative action by African elephant range states is the strongest and best approach. Harvey (2015) explained that without collective action, poaching would not cease as criminals benefit and thrive off of African elephant range states’ divisions.

CITES-authorized one-off ivory sales and unregulated, domestic ivory trade confuse the market. They inhibit demand reduction strategies by confusing consumers, who are hearing stop buying but seeing new products available to buy. Therefore, similar to the call by the London Declaration, Harvey (2015) argues for destruction of ivory stockpiles by all African elephant range states. This strategy combats the illegal ivory trade while complementing and supporting enforcement and demand reduction strategies. Together, they show a consistent, collective effort to combat the illicit ivory trade while clearly expressing the illicit trade of ivory must end.

It is important to explain Harvey’s (2015) model calls for two required antecedents before collective destruction of ivory stockpiles occurs. First, ivory destruction should only occur after demand for ivory is reduced (Harvey, 2015). If demand is not reduced and ivory destruction occurs, criminals could increase their poaching to replace or create their own illicit ivory stockpiles or attempt to raid stockpiles before their destruction. Therefore, ivory demand must be
reduced before destroying ivory stockpiles to ensure it does not increase poaching. Similarly, there must be complementary enforcement deterring the illicit trade.

Second, if ivory stockpiles are destroyed, ivory demand reduced, and ivory trade is completely banned, the asset value of elephants will be diminished (Harvey, 2015). Therefore, it is necessary to increase the value of elephants before the destruction of ivory stockpiles. This requires ensuring that all countries gain equivalent or greater value from elephants than the potential loss of revenue from destroying rather than selling their ivory stockpiles (Harvey, 2015). This could be achieved through increased ecotourism, photographic holidays, and game-viewing safaris. It additionally requires revenue from these activities benefitting local communities that may have previously benefited from the illicit ivory trade or poaching (Harvey, 2015). This will help local communities to value the elephants more alive than dead for its meat or ivory. To do this, Harvey (2015) argues it is necessary to consider cost-analysis of land use and alternative livelihoods, prevention of new human-elephant conflicts, and avoidance of competing development priorities overriding the prioritization of conserving elephants (Harvey, 2015). Overall, these arguments support ivory stockpile destruction as the most effective strategy assuming parameters for its implementation are initially met. Only through destruction of ivory stockpiles is a consistent, collective effort expressed and used to most effectively combat this illicit trade.

**Counterarguments against ivory stockpile destruction.** Proponents of ivory stockpile sale argue against the destruction of ivory stockpiles by African elephant range states. First, a counterargument was presented by t’ Sas-Rolfes, Moyle, and Stiles (2014) stating that the call for ivory stockpile destruction by the international community is based on the assumption:

that if there is no ivory to sell or otherwise leak onto the market, there would be no
trade to stimulate elephant poaching. This simplistic argument has a superficial logic and emotional appeal, but it does not fit the empirical evidence or stand up to economic analysis.” (p. 66)

Opponents argue that ivory stockpile destruction increases poaching and the price of ivory (Bergstrom, 1990, as cited in, t’ Sas-Rolfes, Moyle, & Stiles, 2014). Destruction of ivory creates a scarcity effect leading to more poaching by criminals to replace loss product as well as leading to increased demand due to apparent scarcity of future availability of the product. This increased demand leads to higher prices for ivory. This then in turn increases demand for ivory and, further, increases the poaching of elephants to supply the increased demand, and so on.

Secondly, a more conjectural counterargument could exist in my opinion. Destruction of ivory results in the loss of a limited substance, only able to be produced by a declining elephant population. This is not like the destruction of illicit drugs or weapons, which are constantly replaced with new drugs or weapons being synthetically made. Continued ivory stockpile destruction could result in the near eradication of this substance from existence. The decision to destroy ivory is preemptive when it is still being debated whether or not destruction of ivory stockpiles can save the only producers of ivory from the impending threat of their extinction due to facing the highest rates of poaching recorded (t’ Sas-Rolfes, Moyle, & Stiles, 2014).

Finally, the last argument against destroying ivory stockpiles was presented by t’ Sas-Rolfes, Moyle, and Stiles (2014). They suggested there might be a new trend of illegal ivory stockpiling by private individuals or ivory carving companies. They concluded this possibility after finding an increased amount of ivory entering China but no increase in illegal or legal sales of ivory; this implied that the illicit ivory was stockpiled rather than sold (t’ Sas-Rolfes, Moyle, & Stiles, 2014). Overall, t’ Sas-Rolfes, Moyle, and Stiles (2014) reiterate the fact that the impact
of ivory destructions is inconclusive. Therefore, they argue destructions should not be conducted until they meet the precautionary principle criteria of having a known outcome. The opponents of ivory stockpile destruction alternatively argue for ivory stockpile sale as the most effective ivory stockpile management strategy; their arguments will now be discussed.

**Arguments for ivory stockpile sale.** Conrad (2012) notes that legal and managed trade based on sustainable use of species has been widely debated around its legality, management, and impact. Yet, it is often discounted or ruled out within the conservation community and by animal welfare organizations. She argues that it is necessary to determine the best strategy because a current “perfect storm” is causing the CITES trade ban to threaten rather than protect elephants. Therefore, she argues it is necessary to research and seriously consider an alternative solution, namely, outcompeting the illegal market with legal, regulated trade.

Proponents of legal regulated ivory trade range in their goals from calling for a full legalization of the entire ivory trade to supporting continued sale of ivory stockpiles. Currently, there is a legal, regulated quota system for international commercial trade of ivory that allows the CITES-authorized one-off ivory stockpile sales. The ivory stockpile sale strategy is argued by its proponents to conserve elephants through decreasing the illegal ivory trade and elephant poaching by: (a) funding conservation efforts and (b) the legal, regulated trade eliminating the illegal trade. After presenting these arguments, a summary of the counterarguments against ivory stockpile sale by African elephant range states will be discussed.

**Funds conservation efforts.** The first argument for ivory stockpile sale is that it funds the conservation of African elephants to protect them from the illegal ivory trade and poaching. Per the outlines of CITES, the revenue from one-off sales of ivory stockpiles must be exclusively used to fund elephant conservation or to increase community development and conservation
awareness by funding programs offered to communities within or adjacent to elephant ranges (CITES, 2007). Following the 2008 sale, CITES reported that over US $15 million was raised to fund conservation efforts in the four seller countries (CITES, 2008; UNEP et al., 2013). Furthermore, Bulte, Damania, and van Kooten (2007) discussed how the economic incentive of selling ivory stockpiles could encourage African elephant range states to increase their investment in elephant protection and conservation. Finally, Bulte, Damania, and van Kooten (2007) discussed a more speculative idea that by allowing highly regulated but limited ivory stockpile sales it increases CITES’ compliance by all African elephant range states. CITES is a voluntary convention and African elephant range states are not required to comply (CITES, n.d.). Bulte, Damania, and van Kooten (2007) argue that it may be best to allow the states disagreeing with the ban of all ivory trade to continue one-off ivory stockpile sales and gain limited economic revenue. This could be preventing a scenario of “African countries from going it alone by selling ivory, much as Norway, Iceland, and Japan circumvented the International Whaling Commission” (Bulte, Damania, and van Kooten, 2007, p. 617). If so, one-off ivory stockpile sales are a small cost for their appeasement and, more importantly, ensures the continued cooperation of all African elephant range states to conserve their African elephants. Overall, it is argued that ivory stockpile sale ensures the protection of African elephants by funding conservation efforts.

**Legal, regulated ivory trade eliminates the illicit ivory trade.** The second argument for ivory stockpile sale is that legal, regulated ivory trade outcompetes and eliminates illegal ivory trade markets. Proponents of CITES-authorized one-off ivory stockpile sales often argue for this strategy because it is a form of legal regulated trade and base their argument on what it could achieve if expanded to a global legal, regulated trade of ivory. For example, it is argued that
“legalization allows for more effective regulation and control of the trade as well as sales contribute to conservation by satisfying demand, thereby taking pressure off wild populations of the species” (Bennett, 2014, p. 55).

Also, it is argued that trade bans, specifically CITES, have failed to diminish the illegal ivory trade and poaching of elephants (Conrad, 2012; Lemieux & Clarke, 2009). CITES is unable to manage the national legislation and domestic trade of ivory within a country; therefore, many countries have unregulated domestic ivory trade markets (Lemieux & Clarke, 2009). These countries as well as countries bordering them, especially if further faced with high corruption or civil war, continue to also have decreasing elephant populations because their unregulated domestic trades facilitate the illicit trade of ivory. Since the trade ban has not effectively eliminated the illicit ivory trade nor is capable of regulating domestic ivory trade, it is argued that another approach is necessary. The other option is to regulate and legalize ivory trade in order to outcompete and eliminate illegal markets, including regulating the many existing domestic ivory markets (Conrad, 2012). This legalization could range from more systematic sales of ivory stockpiles per the CITES quota system to a fully, legalized ivory trade. Lemieux and Clarke (2009) studied unregulated and regulated ivory trade markets. They add to this argument stating:

Regulated and unregulated ivory markets play two distinct roles in elephant conservation. Regulated markets reward countries for their continued protection of an endangered species by funding conservation efforts and giving countries a reason to enforce the international embargo. They can therefore be expected to have a positive effect on the elephant population of Africa. Unregulated markets have the opposite effect because they increase poaching incentives as well as the ability to trade ivory on a domestic and
Therefore, ivory stockpile sale as a form of regulated sale offers better protection to African elephants than ivory stockpile destruction.

In additional support of an ivory stockpile sale strategy, research conducted to assess the impact of ivory stockpile sales on the African elephants has shown it has not decreased the total elephant population nor increased poaching; alternatively, it has positively decreased the illegal ivory trade. Bulte, Damania, and van Kooten (2007) conducted a study evaluating the 1999 CITES-authorized one-off ivory stockpile sales impact on elephant mortality. When considering their findings as an aggregate level, they found no support for the sales significantly increasing poaching. To avoid the limitations of an aggregate level analysis, they conducted a panel regression analysis that showed no significant effect on mortality rates except for certain remote locations. However, the affect of these exceptions was relatively small in terms of the total elephant population. Similarly, CITES (2008) has monitored levels of poaching and illegal ivory trade activity since 1999. It has not wavered on its position that “the analysis of seizure data shows no correlation between the controlled ivory sales and an increase in poaching. In fact, levels of illegal ivory trade decreased in the two years following the first one-off sale” (CITES, 2008, para. 4). Overall, proponents of ivory stockpile sale and regulated trade argue it creates a legal, controlled ivory market for interested consumers removing their demand for illicit ivory and, therefore, decreasing the illicit ivory trade and protecting the elephant population (Bennett, 2014; Lemieux & Clarke, 2009).

**Counterarguments against ivory stockpile sale.** The counterarguments against the sale of ivory stockpiles questions its ability to actually increase conservation and eliminate the illegal ivory trade. First, the literature counter argued that ivory stockpile does not necessarily increase
conservation. Although its proponents claim ivory stockpile sales fund much needed conservation of elephants, the stipulations for selling an ivory stockpile prevent many countries (desperately needing to protect their elephant populations) from using this strategy to fund greater conservation efforts. African elephant range states must have a well-managed elephant population in order for them to receive an Appendix II status enabling them to sell their stockpiled ivory. As of the 2008 sale, range states cannot sell confiscated illegal ivory within their stockpiles. Therefore, countries that desperately need conservation funds to better protect their elephant populations from severe poaching will not be able to sell their ivory stockpiles because their elephant populations do not qualify for Appendix II status. Also, even if they were able to downlist their elephant population, their stockpiles are primarily supplied by confiscated illicit ivory that is unable to be sold.

Furthermore, in my opinion it could be speculated that ivory stockpile sales do not necessarily support an increase in conservation efforts. Although the funds raised may be put towards conservation efforts, these efforts inherently have to already be in place. Otherwise, the African elephant range state would not have a well-managed elephant population required to qualify their elephant population for its Appendix II listing. Therefore, ivory stockpile sales may instead simply allow a country to free up the state funds they had put towards conservation efforts by allocating the sale revenue towards their same existing conservation efforts. I am not arguing whether or not this is positive or negative rather it plausibly shows that sales do not necessarily increase conservation. The case simply becomes one in which elephants are paying for their own conservation.

Other researchers have also similarly questioned ivory stockpile sales ability to increase African elephant conservation. For example, for one-off ivory stockpile sales to occur it required
dividing the appendix status of a single species, African elephants (CITES, n.d.). Wasser et al. (2010) reiterates that even CITES recommends against split listings as it makes it more complicated to protect that species thereby threatening their conservation (African Elephant Coalition, 2015). Additionally, Harvey (2015) argues that the money from selling ivory stockpiles only appears to be a massive sum to fund conservation efforts. It has been found that the value of an alive elephant over its lifespan is much greater than selling the ivory of a dead elephant (Minerva and Woomer, 2013). Minerva and Woomer (2013) calculated that on average the tusks from an illegally killed elephant are worth US $21,000. Moreover, they argue an elephant is worth more alive than dead. They estimated the tourism value of a single elephant to be $1,607,624.83 over its lifetime or as valuable as 76 dead elephants (Minerva & Woomer, 2013). Tourism revenue from an elephant across its lifespan significantly scales the sum from its ivory tusks thus potentially offering much greater funds for elephant conservation and other development efforts if kept alive (Harvey, 2015). Similarly, Wasser et al. (2010) estimated the:

proceeds of a sale of Tanzania’s 90 tons and Zambia’s 22 tons of ivory are likely to be on the order of $14 million and $3.5 million, respectively, depending on ivory price at auction [~$150/kg at average values achieved in 2008 sales]. This represents less than 1% of annual tourism revenues for Tanzania. (p. 1332).

They also argue that ivory stockpile sale could jeopardize tourism revenue. For example, sale could increase demand for ivory and, thereby, increase poaching. African elephant poaching poses a threat to the tourism industry.

Second, the literature presented the counterargument that ivory stockpile sale does not eliminate the illegal ivory trade. Opponents of ivory stockpile sale argue that in reality “legal sales (one-off or otherwise) facilitate the marketing of illegal ivory, thereby promoting demand
and encouraging poaching” (Bulte, Damania, & van Kooten, 2007, p. 613). Harvey (2015) presents the following two counterarguments against the legalization of the ivory trade, in general, as well as against authorized one-off sale of ivory stockpiles. Harvey (2015) argues that increased supply of legal ivory would not necessarily decrease price. It could actually increase demand from new consumers previously deterred from purchasing illicit ivory. This increased demand could raise the price of ivory. This reasoning is supported by the Environmental Investigation Agency’s study and findings that showed the 2008 one-off ivory stockpile sales failed to reduce demand or the price of ivory (EIA, 2012). Alternatively, the price of ivory was shown to have increased in China, implying greater demand. The EIA argues this was a direct result of the 2008 stockpile sales. Also, these new consumers may demand a supply unable to be met by the legal trade and thus fueling the illegal ivory trade. Harvey (2015) argues, “the conjecture that supply would easily match demand under free market conditions ignores the slow rate at which tusks grow, and that they are not regenerative” (p. 13).

Furthermore, Harvey (2015) argues that ivory is a durable substance with a price-elastic value. It has been shown to maintain its high value regardless of reduction in market demand (Harvey, 2015). This poses a greater threat to the argument that legalization of the trade will decrease the price of ivory. Furthermore, he argues that unregulated domestic trade and one-off sale of ivory stockpiles undermines demand reduction campaigns (Harvey, 2015). Consumers are not going to follow the instructive of a demand reduction campaign to not buy ivory while simultaneously legal ivory is being sold. This counters the argument by proponents of ivory stockpile sale that sale reduces consumer demand for ivory. Rather, he argues ivory stockpile sales cause confusion in the marketplace (Harvey, 2015; Wasser et al., 2010).
Finally, Bennett (2014) argues, “in theory, such robust, transparent, well-governed management systems and enforcement could allow for a legal trade of high-value ivory. At present, that is not feasible due to one major factor: corruption” (p. 56). Corruption is a major development challenge faced by all African elephant range states, some worse than others (WWF & Dalberg, 2012). It is impossible to transparently and fully regulate a legalized trade of a durable, highly valuable substance like ivory because corruption will always enable illegal ivory to enter the legal market (Bennett, 2014, p. 56). Corruption may occur by the government officials responsible for implementing wildlife legislation, by the rangers meant to protect species on reserves, and by the organized criminal syndicates along the entire illegal ivory trade chain (Bennett, 2014). Similarly, EIA argues “that allowing any legal sale of ivory simply provides a means to launder illicit ivory and stimulates the market, resulting in an increase in the poaching of elephants” (EIA, 2012, p. 3).

Overall, the arguments and counterarguments presented for and against both ivory stockpile destruction and ivory stockpile sale are highly contentious. This debate has and continues to facilitate the use of dichotomous ivory stockpile management strategies by African elephant range states. This is because both strategies are argued and at times shown to be effective means to combat the illegal ivory trade and conserve the African elephant population. However, I identified a gap in the literature and research. This became the catalyst for developing the research question of my master thesis.

**Gap in the Literature**

My literature review showed a widely debated discussion on the effectiveness of the two ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale. However, there were no research studies directly comparing these strategies against each
other to determine which was more effective. A study would focus on measuring the effectiveness (defined in variety of ways) of only one particular strategy to combat the illegal ivory trade. Thus, the impact of each strategy was individually evaluated on a variety of relevant variables, such as its association with poaching, price of ivory, consumer demand, or elephant mortality.

The results of the existing studies are contradictory. For example, CITES’ (2008) analysis of seizure data showed that ivory stockpile sale correlated with decreased illegal ivory trade activity. Whereas, the EIA’s (2012) study showed that ivory stockpile sale increased demand and the price of ivory, which would imply increased illicit ivory trade activity. Overall, the literature, although thoroughly debating and arguing for use of these two strategies, has inconclusively shown which strategy is more effective at combatting the illegal ivory trade. This is complicated by the fact that no research studies have directly compared the two strategies to determine which has a greater effect. The gap in the literature has left a need to explore which ivory stockpile management strategy is more effective by directly comparing the two strategies.
Summary

In summary, this chapter reviewed the history of the illegal wildlife trade in general as well as focused on the illicit trade of ivory. It is apparent that the illegal wildlife trade, particularly the illicit trade of ivory, has devastating global implications. Therefore, the international community must collectively act through united, cooperative strategies to most effectively combat the illegal trade of ivory and other wildlife products. The 2014 London Declaration [London Declaration] on the Illegal Wildlife Trade is the leading current collective action by the international community.

Specifically, one of the actions outlined by the London Declaration called for the international community to collectively manage their ivory stockpiles by using a strategy of ivory stockpile destruction. However, the international community contradicts itself. The international community’s Convention on the International Trade in Endangered Species of Wild Fauna and Flora [CITES] continues to allow use of an alternative ivory stockpile management strategy of ivory stockpile sale by certain African elephant range states. The resulting use of dichotomous ivory stockpile management strategies by African elephant range states became the focus of my master thesis.

Additionally, this chapter presented a thorough review of the literature on this dichotomy. It is accepted by the international community that united, cooperative strategies are the most effective way to combat the illegal wildlife trade. The use of dichotomous ivory stockpile management strategies by African elephant range states thus threatens the collective action needed to most effectively combat the illegal ivory trade. Additionally, the effectiveness of these two strategies is widely debated within the literature. Proponents of ivory stockpile destruction argue that it: (a) creates a zero-tolerance message against poaching and the illicit trade of ivory;
(b) prevents stockpiled ivory from entering the illicit trade; and (c) shows a consistent, collective effort to combat the illegal ivory trade. Whereas, proponents of ivory stockpile sale argue that it: (a) funds conservation efforts and (b) eliminates the illegal trade through its legal, regulated trade of ivory. Overall, my review of the literature found that it is inconclusive whether ivory stockpile destruction or ivory stockpile sale is more effective at combatting the illegal ivory trade. Also, my review of the literature showed a gap in the research. There were no direct comparisons of the two ivory stockpile management strategies, which is necessary to determine whether ivory stockpile destruction or ivory stockpile sale is more effective at combatting the illegal ivory trade.

Therefore, my research study seeks to bridge this gap. I will do so by inductively exploring and answering the following research question: which elephant ivory stockpile management strategy used by African elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with more effective combatting of the illegal ivory trade?
CHAPTER 3: METHODOLOGY

Rationale for Chosen Research Design and Methods

A comprehensive review of the available literature (see Chapter 2) demonstrated that an important question had been left unanswered: which strategy for the management of elephant ivory stockpiles (used by African elephant range states) is more effective at combatting the illegal trade of ivory? To explore this question, I had to operationalize the construct, effective combatting of the illegal ivory trade. As such, the research question for my master thesis became: *which elephant ivory stockpile management strategy used by African elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with decreased behavioral intention to poach as well as decreased poaching behavior?*

Before describing the exact design and methods of my research study in this chapter, an overview of the influences and theoretical framework that guided the development of my research question and methodology to answer it will be presented. In this section of the chapter, I will, first, describe the challenges of researching the illicit ivory trade. Secondly, I will explain the theoretical framework I used and the assumptions I made when designing my research study. Finally, I will summarize my rational for the chosen design and methods used.

Challenges of Researching the Illicit Ivory Trade

Any illegal activity, by nature, is intended to avoid detection and quantitative assessment. Therefore, it is extremely difficult to directly and accurately measure the illegal ivory trade as well as the effectiveness of the efforts combatting it. For example, a direct measure of the illegal ivory trade requires measurement of all illicit ivory sales and amounts overtime. A perfect direct measure is not possible as the illicit ivory trade, by nature, is a black market that occurs in unknown locations with undocumented sales. Even a scaled-down direct measure within a
specific area is difficult to conduct, such as counting illegal sales or the number of products illegally available for sale overtime in one or more local markets or online auction websites (Gao & Clark, 2014; Hastie & McCrea-Steele, 2014). The challenges include feasibility, costs, time, and gaining the trust of vendors to report illicit activity or show the researcher the illicit products. Additionally, a scaled-down direct measure does not necessarily accurately reflect nor generalize to the total illicit ivory trade. The illicit ivory trade varies greatly across variables of time, location, ivory type (raw or worked), and ivory amount (many tons of ivory tusks to a single pair of ivory chopsticks).

Therefore, past research studies have primarily indirectly measured the illegal ivory trade and the effectiveness of the efforts combatting it. They have used variables including: (a) the portion of illegally killed elephants from CITES’ Monitoring the Illegal Killing of Elephants [MIKE] Program (Bulte, Damania, & van Kooten, 2007; Wittemyer et al., 2014); (b) elephant population counts from the IUCN’s African and Asian Elephant Databases (de Boer et al., 2013; van Kooten, 2008); (c) illegal ivory confiscations reports and their amounts by organizations from CITES’ Elephant Trade Information System or TRAFFIC, the Wildlife Trade Monitoring Network (Milliken, 2014; Underwood, Burn, & Milliken, 2013); and (d) media or news stories reporting illegal wildlife seizures (Patel et al., 2015; Sonricker Hansen, Li, Joly, Mekaru, & Brownstein, 2012). These variables are correlated with the illicit ivory trade and, therefore, indirectly capture a measurement of the illegal ivory trade. For example, if there is a decrease in the poaching of African elephants for their ivory, there would be a decrease in the portion of illegally killed elephants. A decreased portion of illegally killed elephants indirectly shows a decrease in the illegal ivory trade. However, it should be noted that all of these variables are compounded by other influences and are not perfectly causal relationships.
Overall, the challenges of studying the illicit ivory trade had to be considered and overcome in order for me to design my research study. Additionally before discussing how these challenges were overcome, an overview of my theoretical framework and assumptions for my research study will be explained.

**Theoretical Framework and Assumptions**

Next, Ajzen’s (1991) theory of planned behavior, while assuming of the construct of deterrence, provided the theoretical framework for my research methods. I chose my theoretical framework after reading the master thesis of Tournier (2015). He related the construct of deterrence and applied Ajzen’s theory to his study of the illegal wildlife trade and deterring criminal behavior in Southeast Asia. In agreement with Tournier’s assumption of deterrence and the applicability of the theory of planned behavior to the illegal wildlife trade, I also chose to develop my research methods from the same theoretical framework. The similarity of our theses ended here.

It is necessary to overview Ajzen’s (1991) theory of planned behavior and my assumption of the impact of deterrence on criminal behavior to fully understand the application of my theoretical framework when operationalizing the variables within my study. Ajzen (1991) published *The Theory of Planned Behavior* as a way to understand and predict the decisional process of human behavior. His theory of planned behavior explains behavior as well as the intentions that increase the likelihood of acting upon that said behavior. The theory of planned behavior argues that human behavior is primarily a result of intention (behavioral intention). A high level of behavioral intention, or intent to perform a behavior, is required before an individual will actually perform the behavior (Ajzen, 1991; Tournier, 2015).
Further, the theory argues that there are three independent determinants of behavioral intention (Ajzen, 1991). The determinants of behavioral intention are: (a) attitude; (b) subjective norm; and (c) perceived behavioral control. Defined by Ajzen (1991), “the attitude toward the behavior refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (p. 188). For example, an impoverished individual with no alternative livelihood and limited education may have a positive attitude towards poaching as it is a successful way to support his or her family.

The second determinant of behavioral intention is subjective norm. It is a social factor referring “to the perceived social pressure to perform or not to perform the behavior” (Ajzen, 1991, p. 188). For example, prioritization of African elephant conservation and management, such as development of safari tourism to protect African elephants and to fund local community development, create a social norm against illegal poaching. If the subjective norm is to conserve elephants because they are a necessary economic resource for the community through tourism, then perceived social pressure would be against poaching because it economically robs the community.

The third determinant of behavioral intention is perceived behavioral control. It is defined as the “perceived ease or difficulty of performing the behavior. [It] is assumed to reflect past experience as well as anticipated impediments and obstacles” (Ajzen, 1991, p. 188). For example, a high corruption index and weak rule of law would imply ease in poaching as there is less risk of getting caught, weak punitive action, and higher ability to pay off officials that may otherwise prevent the illicit trade of ivory. The three determinants of behavioral intention are generally related such that a favorable attitude and positive subjective norm towards the behavior combined with easily perceived behavioral control would result in greater intention to exhibit the
behavior as well as greater likelihood for exhibiting the behavior (Ajzen, 1991; Tournier, 2015).

Figure 10 provides a visualization of the theory of planned behavior.

![Behavioral Intention](attachment://behavioral_intention.png)

Figure 10. Theory of planned behavior. The decisional process of human behavior from the three determinants of behavioral intention (right) to the intent to act to the physical action (left). (Sources: Ajzen, 1991; Tournier, 2015, p. 15).

Furthermore, my master thesis assumes that criminal behavior can be deterred. Nagin (2012) explains the construct of deterrence as “the notion that people consciously try to avoid pain and seek pleasure. It follows that by making a choice painful enough—such as the choice of crime—individuals will choose not to engage in the act” (p. 67). Therefore, it is assumed that greater enforcement and harsher punishment will deter criminal behavior. Nagin (2012) elaborates that to deter crime there must be “certainty of punishment [defined as] the probability that a criminal act will be followed by punishment” and “severity of punishment, [which] involves the level of punishment that is meted out” (2012, p. 71; Tournier, 2015). Although both elements deter criminal behavior, certainty of punishment has a greater impact (Tournier, 2015). With no certainty of punishment (a perceived low chance of being caught), criminals will not be significantly deterred by increased severity of punishment. Related to my research study, Tournier (2015) applied the construct of deterrence specifically to the illegal wildlife trade in Southeast Asia. He argued for stronger regulations and penalties for perpetrators of illegal wildlife crime because currently the illicit trade of wildlife in Southeast Asia offers minimal risk.
with high profit for perpetrators. Therefore, he argues that stronger laws and enforcement are necessary to deter perpetrators of wildlife crimes.

Although there are criticisms of the effectiveness of deterrence on criminal behavior especially related to recidivism, I have chosen to assume deterrence and its ability to decrease criminal behavior within my master thesis (Nagin, 2012; Tournier, 2015). The decision to make this assumption was supported by my findings during my review of the literature (see Chapter 2). Weak governance, high corruption, and lax law enforcement are correlated with increased elephant poaching and the illegal ivory trade activity (Bennett, 2014; UNEP et al., 2013). Whereas, stronger governance, low corruption, and strong law enforcement are correlated with decreased poaching and illicit ivory trade activity (Bennett, 2014; UNEP et al., 2013). In other words, these factors deterred perpetrators from illegal poaching and the illegal ivory trade. With the necessary explanation of this theory and my assumptions, it is possible to understand my rationale and application of my theoretical framework.

**Summary of Rationale**

In summary, my theoretical framework and methodology was rationally chosen in order to best answer my research question. The question unanswered within the current literature was: which elephant ivory stockpile management strategy used by African elephant range states is more effective at combatting the illegal trade of ivory? When considering this question, my chosen theoretical framework provided a way to operationalize the construct of “effective combatting of the illegal trade of ivory.” My theoretical framework and assumptions allowed me to define this construct as decreasing both the illicit activity (behavior) as well as decreasing the indirect factors that influence a criminal’s likelihood to participate in that illicit activity (behavioral intention).
Additionally, my review of the literature showed that the illicit ivory trade is largely supplied by African elephant poaching, which is rapidly decreasing the total African elephant population (Gao & Clark, 2014; Milliken, 2015; Patel et al., 2015; Ratchford, Allgood, & Todd, 2013; UNEP et al., 2013). Therefore, my study accepted reduction of poaching behavior and reduction of an individual’s behavioral intention to poach as being most indicative of effective combatting of the illegal ivory trade. As such, the construct of effective combatting of the illegal ivory trade was operationalized within my study as decreased behavioral intention to poach and decreased poaching behavior.

Next, I chose a very specific design and methodology that allowed me to overcome the challenges of researching an illicit trade and answer my research question. Related to the researcher’s location in the United States, the collection and quantitative secondary analysis of public online archival data sets was necessarily chosen as my method for researching the illicit ivory trade. However, through use of archival datasets and information from a variety of sources, my research study intended to capture a more expansive perspective rather than relying on a single archival dataset.

Furthermore, when considering how to best explore and answer my research question, I chose an inductive non-experimental research design. As the literature was inconclusive and divided as to which strategy is more effective, I chose to inductively explore my research question rather than deductively test a hypothesis or experimentally determine causal relationships. This design allows me to explore how the two different ivory stockpile management strategies used by African elephant range states comparatively correlated with decreased poaching behavior and decreased behavioral intention to poach. My necessary use of a secondary analysis of archival data was also supported by my inductive, non-experimental
methodology.

Due to the non-experimental design of my study, I recognized that my study is unable to show any causal relationships. However, the analysis and identified trends from my inductive approach will provide valuable insights that can foundationally support and direct future research. It is recognized that a number of limitations exist due to the nature of studying an illicit trade, use of archival data, and using non-random methods of my study. These limitations will be discussed in greater detail in Chapter 5 of my master thesis. After full recognition and discussion of its limitations, the research design chosen for my master thesis, in my opinion, offered the best method for identifying correlations necessary to bridge the gap in the existing research. Additionally, this foundational research will support future research and statistical evidence necessary for the development of a united, collaborative approach of ivory stockpile management by African elephant range states to most effectively combat the illegal ivory trade. By initially reviewing my chosen theoretical framework and rationale for my choices, it provides a richer understanding of my research design and methods, which will be discussed next.
Research Design and Methods

The following is a description of the design and methods of the research study for my master thesis. This description includes: (a) the design of my research study; (b) operationalization of the variables within my study; (c) the population and sampling method of my study; (d) the data collection procedures of the archival data used within my study; and (e) the data processing and analysis procedures of my study.

Design

Using an inductive approach, my exploratory research study conducted a quantitative, non-experimental secondary analysis of free, public online archival datasets and statistics from a variety of sources to answer my research question. My master thesis explores and seeks to answer its research question: which elephant ivory stockpile management strategy used by African elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with more effective combatting of the illegal ivory trade, operationalized as decreased behavioral intention to poach as well as decreased poaching behavior? Using this approach, I made no hypotheses. Instead, I will use the findings from my study to identify correlations and answer my research question.

My research study used a non-probability sampling method to collect my sample from the population. My sample included all occurrences of ivory stockpile destruction or ivory stockpile sale by African elephant range states from 2008 through 2012. Six occurrences during this time frame, two destructions and four sales by African elephant range states, were identified and included in the sample of my research study. To compare the two strategies, the findings from my study were analyzed and compared the combined results from occurrences of ivory stockpile destruction to the combined results from the occurrences of ivory stockpile sale. The
methodology of my study measured archival data sets (referred to my study as indicators) which indicated whether each occurrence of ivory stockpile destruction or ivory stockpile sale was associated with: (a) decreased or increased poaching behavior during a five-year period and (b) decreased or increased behavioral intention to poach during a five-year period. The five-year period included one year before the implemented strategy through three years after the implemented strategy. For example, if an occurrence of ivory stockpile destruction or sale occurred in 2008, the five-year period was 2007, 2008, 2009, 2010, and 2011. For both strategies, I calculated the frequency of indications (increased or decreased) from the occurrences in my sample for both variables: (a) poaching behavior and (b) behavioral intention to poach. Using cross-tabulation analyses of my variables, I statistically analyzed for correlations between both: (a) strategy and poaching behavior and (b) strategy and behavioral intention to poach. The strategy found to be correlated better with decreased poaching behavior and behavioral intention to poach would be identified as the more effective strategy for African elephant range states to use.

To measure my variables of behavioral intention to poach and poaching behavior, I operationalized six indicators (archival data sets) of behavioral intention to poach and two indicators (archival data sets) of poaching behavior per my theoretical framework. Each indicator was selected based on the findings in my literature review or the archival data sets used in previous studies. For each indicator per its unique operationalization (see sections, Behavioral Intention to Poach Indicators and Poaching Behavior Indicators), I collected, measured, graphed, and coded the data from an online, public archival dataset source. The data was specific to the African elephant range state that had used the ivory stockpile destruction or ivory stockpile sale occurrence included in the sample of my study. The findings from each indicator were coded to
indicate the directional change (increased or decreased) of either poaching behavior or behavioral intention to poach for every occurrence in the sample study over its applicable five-year period. The indication (increased or decreased) findings from each indicator for every occurrence of destruction or sale within my study will be summarized and entered into my summary table (see Table 2).

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*Table 2. My research study design. The table shows each indicator (left column) which will be measured and coded to indicate either increased or decreased behavioral intention to poach or poaching behavior for each occurrence of either ivory stockpile destruction or sale within the sample of my study (top row).*
Operationalization

The operationalization of each variable is described next. Each variable was thoroughly defined as well as its precise measurement for specific use within my research study.

Ivory stockpile. To operationalize ivory stockpile, my research study defines it as a collection of elephant ivory, raw or worked, owned by and managed by an African elephant range state.

Ivory stockpile destruction occurrence. Ivory stockpile destruction occurrence is operationalized as a use of an ivory stockpile destruction strategy from 2008 through 2012 by an African elephant range state to manage its elephant ivory stockpile and results in a publicized event where the country destroys all or a portion of its ivory stockpile through burning or crushing the illicit ivory.

Ivory stockpile sale occurrence. Ivory stockpile sale occurrence is operationalized as a use of an ivory stockpile management sale strategy from 2008 through 2012 by an African elephant range state to manage its elephant ivory stockpile and results in CITES listing the country’s African elephant population as Appendix II and then the country sells a portion of its ivory stockpile in a CITES-authorized one-off sale.

Effective combatting of the illegal ivory trade. Effective combatting of the illegal ivory trade was operationalized as indication of decreased behavioral intention to poach and decreased poaching behavior of African elephants during a five-year period. The five-year period was determined by the year of the occurrence of either an ivory stockpile destruction or sale. The five-year period included collected data from the year before the elephant ivory stockpile management strategy was implemented, from the year the strategy was implemented, and from the three years after the strategy was implemented. As previously noted, effective combatting of
the illegal ivory trade was operationalized based on Ajzen’s (1991) theory of planned behavior.

**Indicator.** An indicator is an online, public archival data set. Its measurement during a five-year period indicates the directional change (increase or decrease) of either behavioral intention to poach or poaching behavior during that period for each occurrence in the sample of my population. Each indicator is precisely operationalized (see sections, Behavioral Intention to Poach Indicators and Poaching Behavior Indicators). The selected indicators were chosen due to their use in previous research studies or from the findings of my review of the literature.

Considering the difficulty of measuring illicit activity, I chose to not measure the changed amount of behavioral intention to poach or poaching behavior. Rather, I chose to measure directional change, whether behavioral intention to poach or poaching behavior had increased or decreased, during the evaluated five-year period for each occurrence. Also, the countries that have elephant populations ranked as Appendix II by CITES inherently have less poaching, or, otherwise, their elephant populations would not have been downlisted. By not measuring the amount of change and only measuring the direction of change, I was able to equally compare all occurrences within the sample of my study. As a caveat, this study makes the assumption that any amount of decreased or increased poaching behavior and behavioral intention to poach is important because it is indicative of trends. As such, this study equally values similar directional change regardless of the amount of those changes.

**Behavioral intention to poach indicators.** The behavioral intention to poach indicators measured archival data sets that influence an individual’s perceived likelihood or intent to engage in African elephant poaching. Each indicator was operationalized, such that its collected archival data set could be measured and its measurement would indicate either increased or decreased behavioral intention to poach during the applicable five-year period for every
occurrence within the sample of my study. As outlined by the theory of planned behavior, the determinants of behavioral intention are attitude, subjective norm, and perceived behavioral control (Ajzen, 1991). Six indicators were chosen and each one is associated with one of the determinants of behavioral intention. Each of the behavioral intention to poach indicators, their indication, and source are listed in Table 3.

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<td></td>
<td>Per Capita Gross Domestic Product</td>
<td></td>
<td>Increased pc GDP = Decreased Behavioral Intention to Poach</td>
<td>IMF</td>
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<td>National Legislation Meeting Requirements for Implementation of CITES</td>
<td>Perceived Behavioral Control</td>
<td>Had Legislation Meeting Requirements for Implementation of CITES = Decreased Behavioral Intention to Poach</td>
<td>CITES</td>
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<td>Control of Corruption Index</td>
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<td>Increased Control of Corruption Index = Decreased Behavioral Intention to Poach</td>
<td>World Bank</td>
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<td>Rule of Law Index</td>
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<td>Increased Rule of Law Index = Decreased Behavioral Intention to Poach</td>
<td>World Bank</td>
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Table 3. Indicators of behavioral intention to poach. This table lists each indicator of behavioral intention to poach, its associated determinant, its indication, and its source.

Next, the six indicators of behavioral intention are summarized. The summary describes its archival data source, its operationalization, and the rationale for its use by my study. The first two indicators of behavioral intention to poach correspond to the determinant of attitude and are factors that influence an individual’s favorable or unfavorable evaluation of poaching behavior (Ajzen, 1991). Applying the theory of planned behavior, the more favorable the evaluation of poaching behavior the more likely an individual is to behave in that way, and, therefore, their
behavioral intention to poach is increased. The two behavioral intention to poach indicators associated with the determinant of attitude are adult literacy rate and per capita gross domestic product.

**Adult literacy rate indicator.** The adult literacy rate indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in the sample of my study to indicate behavioral intention to poach. The collected archival data set was the reported percentage of literate adults (aged 15 years or older, including both sexes within the total country’s population) in each applicable year for the African elephant range state that had used each occurred strategy.

**Source and operationalization.** The archival data source used for this indicator was the United Nations Educational, Scientific, and Cultural Organization’s [UNESCO] Institute for Statistics from their online website, http://data.uis.unesco.org/. The data was collected using their “create a dataset” tool. The data was generated through selection of their variable of “adult literacy rate, population 15+ years, both sexes (percent)” and the African elephant range states that had used each occurred strategy within my sample for their applicable years.

Due to sporadic data reported to UNESCO from many countries, I opted to collect the data uniquely for this indicator instead of only during the five-year period. I collected any available annual percentage of literature adults from 2007 through 2015 for each African elephant range state that had used each occurred strategy. Due to missing data, this allowed me to better measure the change in literacy rate from prior to the occurrences of sale or destruction of the ivory stockpiles through the years following. I then plotted all data points (year, percentage of literature adults) for each country on an Excel line graph with each line representing a different occurrence within my sample. A linear trend line and its equation were
assigned to the data of each occurrence. Using the findings from the indicator, behavioral
intention to poach was coded as increased or decreased for each occurrence. If the linear trend
line and its equation were an increasing line, it indicated an increase in adult literacy rate and
behavioral intention to poach was coded as decreased for that occurrence. If the linear trend line
and its equation were a decreasing or no change line, it indicated a decrease in adult literacy rate
and behavioral intention to poach was coded as increased. An asterisk next to the findings would
indicate that there was missing data points from the archival data source. Two asterisks next to
the findings would indicate that archival data was not yet available for 2015.

*Rationale.* A research study by Boer et al. (2013) found that increased adult literacy rate
was positively correlated with higher elephant densities. Prior research by Vanclary (2001) and
Kideghesho et al. (2007) showed “a population’s educational background is positively correlated
with attitudes towards conservation” (as cited in Boer et al., 2013, p. 470). This is important for
my study as it suggests that areas with higher literacy rates would also have a more unfavorable
attitude towards elephant poaching. Thus, increased literacy rates cause an unfavorable attitude
towards poaching (individuals would be less likely to poach), which indicates decreased
behavioral intention to poach. Therefore, I chose to use adult literacy rate as an indicator of
behavioral intention to poach associated with its determinant of attitude, despite the weaker
nature of its data. In 2015, all countries had a reported percentage of adult literacy. Therefore, it
was chosen to create a trend line, including any available data from 2007 through 2015, to better
capture the change that occurred from prior to sale or destruction occurrences through the years
following them. By collecting more data over a longer period, it strengthened the limited data
available and indication provided by this indicator.
**Per capita gross domestic product indicator.** The per capita gross domestic product [GDP] indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in the sample of my study to indicate behavioral intention to poach. The collected archival data set was the reported per capita GDP (in current US dollars) in each applicable year for the African elephant range state that had used each occurred strategy.

**Source and operationalization.** The archival data source used for this indicator was the International Monetary Fund’s [IMF] World Economic Outlook Database from their online website, http://www.imf.org/external/pubs/ft/weo/2015/02/weodata/index.aspx. The data was collected using their “World Economic Outlook Database” tool. The data was generated through the selection of their variable of “gross domestic product per capita, current prices (U.S. dollars)” and the African elephant range states that had used each occurred strategy within my sample for their applicable years.

I collected the available per capita GDP amounts for the applicable five-year period for each African elephant range state that had used an occurred strategy. It was collected between the years of 2007 through 2011 for an occurrence of ivory stockpile destruction or sale in 2008, between 2010 through 2014 for an occurrence in 2011, and between 2011 through 2015 for an occurrence in 2012. I then plotted all data points (year, per capita GDP) for each country on an Excel line graph with each line representing a different occurrence in my sample. A linear trend line and its equation were assigned to the data of each occurrence. Using the findings from the indicator, behavioral intention to poach was coded as increased or decreased for each occurrence. If the linear trend line and its equation were an increasing line, it indicated an increase in per capita GDP and behavioral intention to poach was coded as decreased for that occurrence. If the linear trend line and its equation were a decreasing or no change line, it indicated a decrease in
per capita GDP and behavioral intention to poach was coded as increased. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

*Rationale.* A research study by Boer et al. (2013) found that increased per capita gross domestic product was positively correlated with higher elephant densities. They chose to study per capita GDP because Teel et al. (2007) and Burn et al. (2011) had found that “differences between countries in human welfare, such as reflected in differences in GDP/cap or life expectancy (LEI), are known positively to influence attitudes towards conservation” (as cited in Boer et al., 2013, p. 470). This is relevant to my research study as it suggests that in areas with increased per capita GDP there would also be a more unfavorable attitude towards elephant poaching. Thus, increased per capita GDP causes an unfavorable attitude of poaching (individuals are less likely to poach), which indicates decreased behavioral intention to poach. Therefore, I chose per capita GDP as an indicator of behavioral intention to poach associated with its determinant of attitude. It is additionally important to note that the per capita GDP data sets from International Monetary Fund were chosen over the datasets from the World Bank (http://data.worldbank.org/) because IMF had more complete data.

The third behavioral intention to poach indicator corresponds to the determinant, subjective norm. Considering the theory of planned behavior, this indicator is defined as a factor influencing an individual’s perceived social pressure to either poach or not poach African elephants. A greater social pressure to not poach (individuals are less likely to poach) indicates decreased behavioral intention to poach (Ajzen, 1991). The behavioral intention to poach indicator chosen to measure the determinant of subjective norm was the national African elephant management and planning strategy.
National African elephant management and planning strategy indicator. The national African elephant management and planning strategy indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in my sample to indicate behavioral intention to poach. The collected archival data set determined for each African elephant range state, which had used each occurred strategy in my sample, whether or not it had a country specific National African Elephant Management and Planning Strategy updated in or after 2007.

Source and operationalization. The African Elephant Specialist Group, an entity of the International Union for Conservation of Nature, encourages and assists African elephant range states to develop national, subregional, and continental strategies and plans to conserve and protect African elephants (IUCN/AfESG, 2016). One of the national strategies encouraged for all African elephant range states to create is a national African elephant management and planning strategy to prioritize and outline steps to conserve the African elephants within their state (IUCN/AfESG, 2016). The archival data source used for this indicator was the International Union for Conservation of Nature from their online website, https://www.iucn.org/about/work/programmes/species/who_we_are/ssc_specialist_groups_and_red_list_authorities_directory/mammals/african_elephant/strategies_plans/. The website and its linked pages were last updated in 2015. The data was collected by selecting a webpage link for each geographical region of Africa. On each linked webpage, there was the list of the African countries in that region who had a strategy, the year it was updated, and, if available, a pdf copy of the strategy. For every African elephant range state that had used each occurred strategy in my sample, I recorded if the country had a national African elephant management and planning strategy as well as the year the strategy was last updated.
This indicator, due to the type of data collected, was another exception to the five-year period. For this indicator, I conducted a single evaluation of the recorded data to code behavioral intention to poach as increased or decreased for each occurrence. To capture the directional change of behavioral intention to poach, I determined if the African elephant range state had a national strategy, updated in or after 2007. If so, it indicated a subjective norm of protecting and conserving African elephants and, as such, a social pressure to not poach African elephants. Therefore, the behavioral intention to poach was coded as decreased for that occurrence. However, if the African elephant range state had an outdated national strategy (not updated since 2007) or did not have a national strategy, it indicated a lacking subjective norm of protecting and conserving African elephants and, therefore, a lacking social pressure to not poach. In this case, the behavioral intention to poach for that occurrence was coded as increased. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

**Rationale.** The review of the literature did not show an association between any particular variable and social pressure deterring poaching. IUCN’s African Elephant Specialist Group argue that a national African elephant management and planning strategy is an important tool for effective elephant conservation (IUCN/AfESG, 2016). Thus, in my opinion, presence of a national strategy causes a greater national priority of African elephant conservation. If the subjective norm is to conserve and protect African elephants (individuals are less likely to poach), then it indicates decreased behavioral intention to poach. Therefore, I chose presence of an updated national African elephant management and planning strategy as an indicator of behavioral intention to poach associated with its determinant of subjective norm.
Similarly, some African elephant range states have national ivory action plans that are strongly encouraged by CITES to address the illegal trade of ivory directly (CITES, n.d.). However, I chose not to use this as an indicator because only countries most heavily implicated in the illegal ivory trade are strongly encouraged to have an ivory action plan. Therefore, not all African elephant range states have this plan. Alternatively, a national African elephant management and planning strategy focuses on preserving and conserving African elephants. Therefore, it is an encouraged priority for all African elephant range states to implement such a strategy and was chosen as my indicator.

The final three indicators of behavioral intention to poach correspond to the determinant of perceived behavioral control. Applying the theory of planned behavior, an indicator of behavioral intention associated with perceived behavioral control was defined as a factor that influences an individual’s perception of the ease or difficulty to poach African elephants. A more difficult perception of poaching (individuals are less likely to poach) indicates decreased behavioral intention to poach (Ajzen, 1991). When considering the determinant of perceived behavioral control on the behavioral intention to poach, the following three indicators were chosen: (a) national legislation meeting requirements for implementation of CITES; (b) control of corruption index; and (c) rule of law index. Each indicator will now be discussed.

*National legislation meeting requirements for implementation of CITES indicator.* The national legislation meeting requirements for implementation of CITES indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in my sample to indicate behavioral intention to poach. The collected archival data set determined whether or not the African elephant range state, which had used an occurred strategy within my sample, had national legislation meeting the requirements for the Convention on International
Trade of Endangered Species of Fauna and Flora [CITES] to be implemented as of 2014.

Source and operationalization. The CITES National Legislation Project conducted and published a report in 2014. The report evaluated each country’s national legislation to determine if it met the requirements for implementation of the Convention on International Trade of Endangered Species of Fauna and Flora. Upon evaluation, each country was ranked by the report into one of three designated categories. The categories are as follows: (a) Category 1: legislation that is believed generally to meet the requirements for implementation of CITES; (b) Category 2: legislation that is believed generally not to meet all of the requirements for the implementation of CITES; and (c) Category 3: legislation that is believed generally not to meet the requirements for the implementation of CITES (CITES, n.d.). The archival data source used for this indicator thus was this 2014 report from the CITES National Legislation Project, which is available on their online website, https://cites.org/eng/legislation. The data was collected from pdf links on their webpage. Each pdf link was a list of all the countries within a particular category. Using each of the pdf links, I recorded the ranked category of each African elephant range state that had used each occurred strategy within my sample.

This indicator, due to the type of data collected, was another exception to the five-year period. For this indicator, I conducted a single evaluation of the recorded data to code behavioral intention to poach as increased or decreased for each occurrence in my sample. If the African elephant range state had a category 1 ranking, it indicated its national legislation met the requirements for implementation of CITES and poaching would be perceived as more difficult. For example, with CITES fully implemented into national legislation, the country does not have an unregulated, legal domestic ivory trade. This means that criminals do not have a legal conduit for which illegal ivory could be traded and causes poaching to be perceived as more difficult.
Therefore, the behavioral intention to poach was coded as decreased for that occurrence. However, if the African elephant range state had a category 2 or category 3 ranking, it indicated that the national legislation failed to fully meet the requirements for implementation of CITES. Therefore, poaching would be perceived as comparatively easier. In this case, the behavioral intention to poach was coded as increased for that occurrence. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

Rationale. CITES uses this report to determine the compliance of a country’s national legislation with its regulation of the trade of endangered species, including banning the commercial trade of ivory (CITES, n.d.). Additionally, it was found that African elephant range states with unregulated illegal or legal domestic trades of ivory had more rapidly declining elephant populations than those without, indicating more poaching to supply these domestic trades (Lemieux & Clarke, 2009). This suggests that poor implementation of CITES into national legislation, such as the failure to ban legal domestic trade of ivory, is indicative of increased poaching and illegal ivory trade. Also, my master thesis assumes that criminals can be deterred from illicit activity, specifically illegal poaching of African elephants. Therefore, I assume that national legislation meeting the requirements for implementation of CITES would deter criminals from poaching because its presence causes poaching to be perceived as more difficult (individuals are less likely to poach) and this then would indicate a decrease in behavioral intention to poach. Therefore, I chose national legislation meeting the requirements for implementation of CITES as an indicator of behavioral intention to poach associated with the determinant of perceived behavioral control.
Additionally, it should be expected that all four countries with Appendix II elephant populations should be ranked as category one and indicated as having decreased behavioral intention to poach. In order for them to be authorized by CITES to downlist their elephant population and sell their ivory stockpiles, it would be assumed that their elephant populations are less endangered, properly managed, and protective national legislation is in place, including meeting the requirements for implementation of CITES.

**Control of corruption index indicator.** The control of corruption index indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in the sample of my study to indicate behavioral intention to poach. The collected archival data set was the control of corruption index score in each applicable year for the African elephant range state that had used each occurred strategy.

**Source and operationalization.** The control of corruption index scores range from -2.5 weak control of corruption (or highly corrupt country) to 2.5 strong control of corruption (or highly uncorrupt country) with each country receiving a single score per year. The archival data source used for this indicator was the World Bank using their online website, http://info.worldbank.org/governance/wgi/index.aspx#reports. Data was collected using their “Worldwide Governance Indicators” tool. The tool generated the data through the selection of their variable of “Control of Corruption” and the African elephant range states that had used each occurred strategy within my sample for their applicable years.

I collected the available control of corruption index scores for the applicable five-year period for each African elephant range state that had used each occurred strategy. It was collected between the years of 2007 through 2011 for an occurrence of ivory stockpile destruction or sale in 2008, between 2010 through 2014 for an occurrence in 2011, and between
2011 through 2015 for an occurrence in 2012. I then plotted all data points (year, control of corruption index score) for each country on an Excel line graph with each line representing a different occurrence within my sample. A linear trend line and its equation were assigned to the data of each occurrence. Using the findings from the indicator, behavioral intention to poach was coded as increased or decreased for each occurrence. If the linear trend line and its equation were an increasing line, it indicated an increase in control of corruption (decreased corruption) and behavioral intention to poach was coded as decreased for that occurrence. If the linear trend line and its equation were a decreasing or no change line, it indicated a decrease in control of corruption (increased corruption) and behavioral intention to poach was coded as increased for that occurrence. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

*Rationale.* My literature review showed a consensus within the research that corruption and African elephant poaching are positively correlated and are threatening African elephant populations (Bennett, 2014; UNEP et al., 2013). Corruption makes poaching of African elephants and the illegal ivory trade easier. For example, corruption allows poachers to be able to pay-off wildlife protection officers and officials (Bennett, 2014). Additionally, it has been shown through analyses by Monitoring the Illegal Killing of Elephants Program [MIKE] that indicators of corruption and weak governance are more strongly correlated with poaching levels than any other national-level indicator (UNEP et al., 2013). Thus, increased control of corruption index scores (less corruption) causes poaching to be perceived as more difficult (individuals are less likely to poach), which indicates decreased behavioral intention to poach. Therefore, I chose control of corruption index as an indicator of behavioral intention to poach associated with the
determinant of perceived behavioral control.

Additionally, the control of corruption index from World Bank was chosen over Transparency International’s Corruption Perceptions Index (http://www.transparency.org/research/cpi/overview). I made this choice because the corruption perceptions index, as explained by Transparency International, cannot be compared across time prior to 2012. Before then, Transparency International ranked countries and scores against other countries in each of their annual reports. This means that Country A’s ranking could decrease from one year to the next but not because Country A became more corrupt. Instead, Country B decreased its corruption and moved higher on the scale than Country A, causing Country A to be ranked lower the following year. For my study it was necessary to compare indexes across time with data prior to 2012. This resulted in my choice to use the archival data from World Bank.

*Rule of law index indicator.* The rule of law index indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in the sample of my study to indicate behavioral intention to poach. The collected archival data set was the rule of law index score in each applicable year for the African elephant range state that had used each occurred strategy within the sample of my study.

*Source and operationalization.* The rule of law index scores range from -2.5 weak rule of law (or poor law enforcement) to strong 2.5 rule of law (or strong law enforcement) with each country receiving a single score per year. The archival data source used for this indicator was the World Bank using their website, http://info.worldbank.org/governance/wgi/index.aspx#reports. Data was collected using their “Worldwide Governance Indicators” tool. The tool generated the data through the selection of their variable of “Rule of Law” and the African elephant range states that had used each occurred strategy within my sample for their applicable years.
I collected the available rule of law index scores for the applicable five-year period for each African elephant range state that had used each occurred strategy. It was collected between the years of 2007 through 2011 for an occurrence of ivory stockpile destruction or sale in 2008, between 2010 through 2014 for an occurrence in 2011, and between 2011 through 2015 for an occurrence in 2012. I then plotted all data points (year, rule of law index score) for each country on an Excel line graph with each line representing a different occurrence within my sample. A linear trend line and its equation were assigned to the data of each occurrence. Using the findings from the indicator, behavioral intention to poach was coded as increased or decreased for each occurrence. If the linear trend line and its equation were an increasing line, it indicated an increase in rule of law (increased law enforcement) and behavioral intention to poach was coded as decreased for that occurrence. If the linear trend line and its equation were a decreasing or no change line, it indicated a decrease in rule of law (decreased law enforcement) and behavioral intention to poach was coded as increased for that occurrence. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

Rationale. Wyler and Sheikh (2013) reported that weak governance facilitates the illegal wildlife trade. A research study by Underwood, Burn, and Milliken (2013) found that increased rule of law index is positively correlated with the seizure rate of illicitly traded ivory. Stronger governance and rule of law indicate greater enforcement of the illegal ivory trade. These research findings suggest that weak rule of law makes poaching of African elephants and the illegal ivory trade easier for criminals because there is low risk of getting caught and minimal punitive action. Thus, increased rule of law index scores causes poaching to be perceived as more difficult (individuals are less likely to poach), which indicates decreased behavioral intention to poach.
Therefore, I chose rule of law index as an indicator of behavioral intention to poach associated with the determinant of perceived behavioral control. Although there may be other variables for measurement of governance and enforcement, my study chose to use the rule of law index because it was a previously used statistically significant measurement. Analyses by the Monitoring the Illegal Killing of Elephants Program [MIKE] have consistently shown that indicators of corruption and poor governance, such as the World Bank’s Worldwide Governance indicators including control of corruption and rule of law indexes, are more strongly correlated with poaching levels than any other national-level indicator (UNEP et al., 2013).

**Poaching behavior indicators.** The poaching behavior indicators measured archival data sets that indirectly indicate African elephant poaching. Each indicator was operationalized, such that its collected archival data set could be measured and its measurement would indicate either increased or decreased poaching behavior during the applicable five-year period for every occurrence of ivory stockpile destruction or sale within the sample of my study. Percentage of illegally killed African elephants and the total African elephant population were chosen as the two indicators of poaching behavior. The poaching behavior indicators, their indication of poaching behavior, and source are listed in Table 4.

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<thead>
<tr>
<th>Indicator</th>
<th>Indication</th>
<th>Source</th>
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<td>Decreased Percentage of Illegally Killed African Elephants = Decreased Poaching Behavior</td>
<td>CITES’ MIKE</td>
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<td>African Elephant Population</td>
<td>Increased or Conserved Elephant Population = Decreased Poaching Behavior</td>
<td>African Elephant Database</td>
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*Table 4. Indicators of poaching behavior. The table lists each indicator of poaching behavior, its indication, and its source.*
Next, the two poaching behavior indicators are summarized describing their operationalization, their archival data source, and the rationale for their use.

**Percentage of illegally killed African elephants indicator.** The percentage of illegally killed African elephants indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in the sample of my study to indicate poaching behavior. The collected archival data set was the total percentage of illegally killed African elephants (out of the total deceased elephants in monitored African elephant populations) in the applicable years for the African elephant range state that had used each occurred strategy.

**Source and operationalization.** The archival data source used for this indicator was the Monitoring the Illegal Killing of Elephants [MIKE], an operation of the Convention on International Trade in Endangered Species of Fauna and Flora (UNEP et al., 2013). Established in 1997, MIKE is a standardized monitoring system that collects data from one or more monitoring sites, which are primarily protected elephant ranges, in most African and Asian elephant range states. Its monitoring sites collect and report the number of elephant carcasses found during the year as well as their assessed cause of death (illegal or natural). This allows for an annual calculation of the portion of illegally killed elephants. The MIKE’s findings identify trends of illegally killed elephants to help to inform decisions regarding elephant populations and their protection.

The archival data was collected from their online website, https://www.google.com/fusiontables/DataSource?docid=1juiqNCOU_wqperYcoq_uCWAZ5Ies8t09hfrRry_137. Their data set can be sorted by country code, which then lists the annual report from each monitoring site of total elephant carcasses and total illegally killed elephant carcasses. For each African elephant range state that had used each occurred strategy, I collected in the applicable five year
period both: (a) the total number of carcasses, including illegally and non-illegally killed elephant carcasses, from all reporting sites within that African elephant range state; and (b) the number of illegally killed elephant carcasses found from all reporting sites within that African elephant range state. Furthermore, this indicator was operationalized as the percentage of illegally killed African elephants. I had to calculate the annual percentage of illegally killed elephants. To do so, I divided the (sum of the total number of illegally killed elephant carcasses from every reporting site located in an African elephant range state for a chosen year) by the (sum of the total number of illegally and non-illegally killed elephant carcasses from every reporting site located in an African elephant range state for that chosen year) which equaled the percentage of illegally killed African elephants for that African elephant range state in that chosen year.

I used the collected data to calculate the percentages of illegally killed African elephants for the applicable five-year period for each African elephant range state that had used each occurred strategy within the sample of my study. For example, a percent was calculated for each of the years from 2007 through 2011 for an occurrence of ivory stockpile destruction or sale in 2008, for each of the years from 2010 through 2014 for an occurrence in 2011, and for each of the years from 2011 through 2015 for an occurrence in 2012. I then plotted all data points (year, percent of illegally killed African elephants) for each country on an Excel line graph with each line representing a different occurrence within my sample. A linear trend line and its equation were assigned to the data of each occurrence of ivory stockpile destruction or sale within the sample of my study. Using the findings from the indicator, poaching behavior was coded as increased or decreased for each occurrence. If the linear trend line and its equation were a decreasing or no change line, it indicated a decreased percentage of illegally killed African
elephants and poaching behavior was coded as decreased for that occurrence. If the linear trend line and its equation were an increasing line, it indicated an increased percentage of illegally killed African elephants and poaching behavior was coded as increased for that occurrence. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

*Rationale.* As previously discussed, there are multiple variables to indirectly measure the illegal ivory trade and the efforts to combat it. I chose the percentage of illegally killed African elephants as my indirect indicator of poaching behavior similar to the studies by Bulte, Damania, and van Kooten (2007) and Wittemyer et al. (2014). However, this percentage is skewed by the fact that it is limited to reports from selective African elephant populations that are closely monitored. Therefore, I chose my second indicator of poaching behavior to strengthen my findings by measuring the African elephant population. My two chosen indicators of poaching behavior are complementary. For example, if there is a decrease in the percentage of illegally killed African elephants within monitored areas of a country as well as an increase in the total elephant population of that country, it would be much more likely that poaching has decreased within that entire African elephant range state. Therefore, my research study chose to use the percentage of illegally killed elephants as well as the African elephant population as the indicators of poaching behavior.

*African elephant population indicator.* The African elephant population indicator collected and measured an archival data set for each occurrence of ivory stockpile destruction or sale in the sample of my study to indicate poaching behavior. The collected archival data set was the total African elephant population (including definite and probable numbers, excluding
possible and speculative numbers) in 2007 and 2013 for the African elephant range state that had used each occurred strategy in my sample.

Source and operationalization. The archival data source used for this indicator was the African Elephant Database, an operation of the International Union for Conservation of Nature’s [IUCN] African Elephant Specialist Group. The group reports the total estimated number and location of the African elephant population every three to five years on its African Elephant Database (IUCN/AfESG, 2016; UNEP, CITES, IUCN, & TRAFFIC, 2013). It collects data on the elephant population from a variety of conservation agencies and researchers across many of the African elephant range states (IUCN/AfESG, 2016). Further, the African elephant population estimate is a sum total of: (a) the definite number of elephants within the population (physically counted animals during aerial surveys); (b) the probable number of elephants within the population (animals counted by dung or other samples), and (c) the possible and speculative numbers of elephants within the population (two calculated estimations with the possible number being more assured). The archival data sets used were from the two most recent African elephant population estimates in 2007 and 2013. Their data sets are available on their online website, http://www.elephantdatabase.org/preview_report/2013_africa_final/Loxodonta_africana/2013/Africa. The data is organized by year and region of Africa. It required accessing additional linked pages to collect the African elephant population numbers and breakdown for each country. For my study, I chose to operationalize the African elephant population as the sum of the definite number and the probable number of elephants.

This indicator, due to the type of data collected, was another exception to the five-year period. For every African elephant range state that had used each occurred strategy in my sample, I calculated their total African elephant population (using definite and probable counts,
excluding possible and speculative counts) for the years of 2007 and 2013. I then plotted the set of data points (year, total number of African elephants) for each country on an Excel line graph with each line representing a different occurrence within my sample. Using the linear line and its equation, poaching behavior was coded as increased or decreased for each occurrence of ivory stockpile destruction or sale within the sample of my study and reflected the directional change during the applicable five-year period. If the linear line and its equation were an increasing or no change line, it indicated an increased or conserved African elephant population (implying decreased poaching) and the indicator was coded as decreased poaching behavior for that occurrence. However, if the linear line and its equation were a decreasing line, it indicated a decreased African elephant population (implying increased poaching) and the indicator was coded as increased poaching for that occurrence. An asterisk next to the findings would indicate that there was missing data points from the archival data source. Two asterisks next to the findings would indicate that archival data was not yet available for 2015.

**Rationale.** Refer to the rationale explained under the indicator, percentage of illegally killed African elephants. The rational for use of my African elephant population indicator is described there as the two indicators are complementary and used together to provide the best indication of poaching behavior.

**Population and Sampling Method**

The sample of my study was collected using non-probability purposive sampling. The population for my study was all occurrences of ivory stockpile destruction or ivory stockpile sale from 1989 (ban on transnational commercial trade of ivory) through 2015 by African elephant range states. I found 17 total occurrences using a list of all ivory stockpile destructions from
Welch (2015) and a list of all ivory stockpile sales reported by CITES (CITES, n.d.; CITES, 2007; CITES, 2008).

The design of my study required being able to evaluate each occurrence in my sample for a five-year period meaning I needed there to be archival data sets available during that period. Therefore, I used purposive sampling to take a sample from my total population that met this criterion. For my population, I found 17 total occurrences including: 6 occurrences that transpired from 1989 through 1992; 0 occurrences that transpired from 1993 through 2007; 6 occurrences that transpired from 2008 through 2012 and 5 occurrences that transpired from 2014 through 2015. I was unable to include the occurrences from 1989 through 1992 because the archival datasets used for my indicators had insufficient data or were not collected then. Additionally, I was unable to include the occurrences from 2014 through 2015. To be able to evaluate the occurrence for a five-year period, it had to have occurred in 2012 or before. For example, an occurrence in 2012 had data collected from one year before the occurrence, 2011, through three years after the occurrence, 2015. As no archival data would be available for 2016 until the year is over, I could not use any occurrences in or after 2013. Furthermore, there was unreported archival data for 2015 for some of my indicators. However, I chose to include 2012 occurrences and evaluate any available archival data. I made a notation if there was missing data. In my opinion, it was better to expand my already limited sample to include any 2012 occurrences rather than exclude it due to a few missing data points.

Therefore, my research study used purposive sampling from the total population of all occurrences of ivory stockpile destruction or ivory stockpile sale by African elephant range states to select any occurrences from 2008 through 2012. Using my sampling method, the sample of my research study became:
1. An Ivory Stockpile Destruction by Kenya in 2011
2. An Ivory Stockpile Destruction by Gabon in 2012
3. An Ivory Stockpile Sale by Botswana in 2008
4. An Ivory Stockpile Sale by Namibia in 2008
5. An Ivory Stockpile Sale by South Africa in 2008
6. An Ivory Stockpile Sale by Zimbabwe in 2008

Data Collection Procedures

After using my sampling method to determine the sample of my research study, I used the following data collection procedures. First, I collected the archival data for each of the eight indicators from their online sources per its operationalization (see section, Operationalization). Each indicator had six collected data sets, one for each of the six occurrences within the sample of my study. Second, per the directive of each indicator’s operationalization, I created any necessary graphs. Third, I measured and coded the findings of each indicator (per its operationalization) for each occurrence in my study. This resulted in each occurrence having six indications (either increased or decreased) of behavioral intention to poach and two indications (either increased or decreased) of poaching behavior for its applicable five-year period. I, then, created a summary table (see Table 2 on page 120). All the occurrences in my sample were placed along the top of the table and each indicator was listed along the left side of the table. For each indicator, its found indications for all occurrences in my sample were recorded within the summary table.

Data Processing and Analysis Procedures

Before discussing my data processing and analysis procedures, it is necessary to recall my research question: which elephant ivory stockpile management strategy used by African
elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with decreased behavioral intention to poach as well as decreased poaching behavior?

In order to explore and answer my research question, I analyzed the correlation between my nominal variables. I analyzed if ivory stockpile destruction or ivory stockpile sale correlated better with decreased or increased behavioral intention to poach. I also analyzed if ivory stockpile destruction or ivory stockpile sale is correlated better with decreased or increased poaching behavior.

Specifically in order to process my data and analyze it, I chose to do two cross-tabulation analyses of the found frequencies for my nominal variables. First, I conducted a cross-tabulation analysis to determine the correlation between ivory stockpile management strategies (ivory stockpile destruction or ivory stockpile sale) and behavioral intention to poach indications (increased or decreased). The method for setting up the analysis is shown in Table 5.

<table>
<thead>
<tr>
<th>Ivory Stockpile Management Strategy</th>
<th>Behavioral Intention to Poach Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increased</td>
</tr>
<tr>
<td>Destruction</td>
<td>For occurrences of destruction, the frequency of “increased” indications</td>
</tr>
<tr>
<td>Sale</td>
<td>For occurrences of sale, the frequency of “increased” indications</td>
</tr>
<tr>
<td>(Total # of frequencies in this column)</td>
<td>(Total # of frequencies in this column)</td>
</tr>
</tbody>
</table>

*Table 5. Method for cross-tabulation analysis of strategy and behavioral intention to poach. The table shows the method for conducting the cross-tabulation analysis of the correlation between ivory stockpile management strategies and the indications of behavioral intention to poach.*

Second, I conducted a cross-tabulation analysis to determine the correlation between ivory stockpile management strategies (ivory stockpile destruction or ivory stockpile sale) and
poaching behavior indications (increased or decreased). The method for setting up the analysis is shown in Table 6.

<table>
<thead>
<tr>
<th>Ivory Stockpile Management Strategy</th>
<th>Poaching Behavior Indications</th>
<th>Number of Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destruction</td>
<td>For occurrences of destruction, the frequency of &quot;increased&quot; indications</td>
<td>(Total # of frequencies in this row)</td>
</tr>
<tr>
<td>Sale</td>
<td>For occurrences of sale, the frequency of &quot;increased&quot; indications</td>
<td>(Total # of frequencies in this column)</td>
</tr>
<tr>
<td></td>
<td>(Total #)</td>
<td></td>
</tr>
</tbody>
</table>

*Table 6. Method for cross-tabulation analysis of strategy and poaching behavior. The table shows the method for conducting the cross-tabulation analysis of the correlation between ivory stockpile management strategies and the indications of poaching behavior.*

To analyze the findings of my cross tabulation analyses, I used a Fisher’s exact test statistic to determine the Fisher’s exact probability score (or p score) for each analysis. It assumes a null hypothesis that there is no correlation between the two variables rather the frequencies occurred by chance, unless the results are shown to be statistically significant (Babbie, 2010). I chose not to analyze my frequency tables using the more common and similar chi-squared statistical test because it is not as accurate for a 2x2 analysis (GraphPad, 2015). Fisher’s exact test statistic was designed for a 2x2 analysis of nominal variables with small populations (GraphPad, 2015). Therefore, I chose this statistical test as the best fit for analyzing my findings.

Using a free online statistical calculator at www.graphpad.com, I calculated the Fisher’s exact probability score for each of my two cross tabulation analyses. The frequencies of my nominal variables in each analysis will be analyzed to determine the Fisher’s exact probability score. If the p score has a value of p < 0.05, the correlation will be determined statistically.
significant. Therefore, I can accept a correlation does exist between the two variables. Also, I can with statistical certainty answer my research question of which strategy is correlated better with decreased behavioral intention to poach and decreased poaching behavior. However, if the p score value is p > 0.05, then my results will be determined statistically non-significant. Without statistical certainty, I cannot assume a correlation between the two variables because it is too probable that the found frequencies may have occurred simply by chance.

In summary, this chapter has thoroughly described the methodology of my research study. Furthermore, this chapter has explained the theoretical framework and rationale for my chosen methodology. The results of my research study will be discussed in the next chapter.
CHAPTER 4: RESULTS

The results of my conducted research study are overviewed in this chapter. First, I present my results. Secondly, I analyze my findings. Finally, I summarize the results of my research study. Although relevant to this chapter, I will discuss the importance of my research study and my results as well as its limitations in the next chapter of my master thesis.
Presentation of Results

In order to compare the two ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale – used by African elephant range states, my findings will determine which strategy is correlated better with decreased behavioral intention to poach and decreased poaching behavior. The sample of my study had two occurrences of ivory stockpile destruction and four occurrences of ivory stockpile sale. I compared the combined findings from occurrences of ivory stockpile destruction to the combined findings from occurrences of ivory stockpile sale (accounting for the increased amount of ivory stockpile sale occurrences) to answer my research question.

Before discussing the comparison of the two strategies, I will present the findings of each indicator. I selected six indicators of behavioral intention to poach and two indicators of poaching behavior within my study. The indication (either increased or decreased behavioral intention to poach or poaching behavior) by each indicator, per its operationalization, during the applicable five-year period for every sampled occurrence of either an ivory stockpile destruction or sale is presented. Each indicator’s findings are graphically presented and summarized in this section of the chapter. Then, a summary table of all found indications will be presented.

First, the six graphs of the collected data for each of the six indicators of behavioral intention to poach as well as a summary of my results for each of these indicators is presented.
Results of Adult Literacy Rate Indicator

For this indicator, the collected data and their trend lines were graphed (see Figure 11).

![Graph showing adult literacy rate](image)

*Figure 11. Adult literacy rate. For this indicator, the figure shows the data collected, graphed, and coded to indicate behavioral intention to poach for each occurrence.*

For this indicator, an increasing linear trend line (positive value before the “x” in the equation) of adult literacy rate indicated decreased behavioral intention to poach. Whereas, a decreasing linear trend line (negative value before the “x” in the equation) of adult literacy rate indicated increased behavioral intention to poach. Using the data collected and presented in the graph (see Figure 11), I found that adult literacy rate indicated decreased behavioral intention to poach for all six occurrences, regardless of the type of ivory stockpile management strategy used.
Results of Per Capita Gross Domestic Product Indicator

For this indicator, the collected data and their trend lines were graphed (see Figure 12).

For this indicator, an increasing linear trend line (positive value before the “x” in the equation) of per capita gross domestic product indicated decreased behavioral intention to poach. Whereas, a decreasing linear trend line (negative value before the “x” in the equation) of per capita gross domestic product indicated increased behavioral intention to poach. Using the data collected and presented in the graph (see Figure 12), I found that per capita gross domestic product indicated decreased behavioral intention to poach for one occurrence of ivory stockpile destruction and for all four occurrences of ivory stockpile sale. Additionally, I found that it indicated increased behavioral intention to poach for one occurrence of ivory stockpile destruction.
Results of National African Elephant Management and Planning Strategy Indicator

The collected data for this indicator was graphed, as shown in Figure 13.

For this indicator, a “yes” (meaning the African elephant range state had a national African elephant management and planning strategy updated in or after 2007) indicated decreased behavioral intention to poach. Whereas, a “no” (meaning the African elephant range state did not have a national African elephant management and planning strategy or that it was last updated prior to 2007) indicated increased behavioral intention to poach. Using the data collected and presented in the graph (see Figure 13) for this indicator, I found that it indicated decreased behavioral intention to poach for one occurrence of ivory stockpile destruction and for one occurrence of ivory stockpile sale. Additionally, I found that it indicated increased behavioral intention to poach for one occurrence of ivory stockpile destruction and three occurrences of ivory stockpile sale.
Results of National Legislation Meeting Requirements for Implementation of CITES Indicator

The collected data for this indicator was graphed, as shown in Figure 14.

For this indicator, a “yes” (meaning the African elephant range state has national legislation meeting requirements for implementation of CITES) indicated decreased behavioral intention to poach. Whereas, a “no” (meaning the African elephant range state does not have national legislation meeting requirements for implementation of CITES) indicated increased behavioral intention to poach. Using the data collected and presented in the graph (see Figure 14) for this indicator, I found that it indicated decreased behavioral intention to poach for three occurrences of ivory stockpile sale. Additionally, I found that it indicated increased behavioral intention to poach for both occurrences of ivory stockpile destruction and one occurrence of ivory stockpile sale.
Results of Control of Corruption Index Indicator

For this indicator, the collected data and their trend lines were graphed (see Figure 15).

For this indicator, an increasing linear trend line (positive value before the “x” in the equation) of control of corruption index scores indicated decreased behavioral intention to poach. Whereas, a decreasing linear trend line (negative value before the “x” in the equation) of control of corruption index scores indicated increased behavioral intention to poach. Using the data collected and presented in the graph (see Figure 15), I found that it indicated decreased behavioral intention to poach for one destruction occurrence and one sale occurrence. Additionally, I found that it indicated increased behavioral intention to poach for one destruction occurrence and three sale occurrences.
Results of Rule of Law Index Indicator

For this indicator, the collected data and their trend lines were graphed (see Figure 16).

![Rule of Law Index Indicator](image)

*Figure 16. Rule of law index. For this indicator, the figure shows the data collected, graphed, and coded to indicate behavioral intention to poach for each occurrence.*

For this indicator, an increasing linear trend line (positive value before the “x” in the equation) of rule of law index scores indicated decreased behavioral intention to poach. Whereas, a decreasing linear trend line (negative value before the “x” in the equation) of rule of law index scores indicated increased behavioral intention to poach. Using the data collected and presented in the graph (see Figure 16), I found that rule of law index indicated decreased behavioral intention to poach for one destruction occurrence and two sale occurrences. Additionally, I found that it indicated increased behavioral intention to poach for one destruction occurrence and two sale occurrences.
Second, the two graphs of the poaching behavior indicators as well as a summary of my results for each of these indicators are presented.

**Results of Percentage of Illegally Killed African Elephants Indicator**

For this indicator, the collected data and their trend lines were graphed (see Figure 17).

*Figure 17. Percentage of illegally killed African elephants. For this indicator, the figure shows the data collected, graphed, and coded to indicate poaching behavior for each occurrence in the sample of my study.*
For this indicator, a decreasing linear trend line (negative value before the “x” in the equation) of the percentage of illegally killed African elephants indicated decreased poaching behavior. Whereas, an increasing linear trend line (positive value before the “x” in the equation) of the percentage of illegally killed African elephants indicated increased poaching behavior. Using the data collected and presented in the graph (see Figure 17 on previous page), I found that the percentage of illegally killed African elephants indicated decreased poaching behavior for both occurrences of ivory stockpile destruction and for one occurrence of ivory stockpile sale. Additionally, I found that it indicated increased poaching behavior for three occurrences of ivory stockpile sale.

**Results of African Elephant Population Indicator**

For this indicator, the collected data and their trend lines were graphed (see Figure 18 on next page). An increasing linear trend line (positive value before the “x” in the equation) of the African elephant population indicated decreased poaching behavior. Whereas, a decreasing linear trend line (negative value before the “x” in the equation) of the African elephant population indicated increased poaching behavior. Using the data collected and presented in the graph (see Figure 18 on next page), I found that the African elephant population indicated decreased poaching behavior for one occurrence of ivory stockpile destruction and two occurrences of ivory stockpile sale. Additionally, I found that it indicated increased poaching behavior for one occurrence of ivory stockpile destruction and two occurrences of ivory stockpile sale.
Figure 18. African elephant population. For this indicator, the figure shows the data collected, graphed, and coded to indicate poaching behavior for each occurrence.
Third, I created a summary table (see Table 7) of all found indications from each indicator for each occurrence in the sample of my study. Each behavioral intention to poach indicator and its indication of either increased or decreased behavioral intention to poach for each occurrence of ivory stockpile destruction or sale is included in the table. Similarly, each poaching behavior indicator and its indication for each ivory stockpile destruction or sale occurrence is, also, listed in the table.

<table>
<thead>
<tr>
<th>Elephant Ivory Stockpile Management Strategies Used by African Elephant Range States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivory Stockpile Destruction</td>
</tr>
<tr>
<td>*Missing data points due to an incomplete archival data set.</td>
</tr>
<tr>
<td>** Missing 2015 data point due to an unavailable archival data set.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Intention to Poach Indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Literacy Rate</td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Decreased*</td>
</tr>
<tr>
<td>Per Capita Gross Domestic Product</td>
<td>Decreased</td>
<td>Increased</td>
<td>Decreased</td>
<td>Decreased</td>
<td>Decreased</td>
<td>Decreased</td>
</tr>
<tr>
<td>National African Elephant Management and Planning Strategy</td>
<td>Decreased</td>
<td>Increased</td>
<td>Increased</td>
<td>Decreased</td>
<td>Increased</td>
<td>Increased</td>
</tr>
<tr>
<td>National Legislation Meeting Requirements for Implementation of CITES</td>
<td>Increased</td>
<td>Increased</td>
<td>Increased</td>
<td>Decreased</td>
<td>Decreased</td>
<td>Decreased</td>
</tr>
<tr>
<td>Control of Corruption Index</td>
<td>Increased</td>
<td>Decreased**</td>
<td>Decreased</td>
<td>Increased</td>
<td>Increased</td>
<td>Increased</td>
</tr>
<tr>
<td>Rule of Law Index</td>
<td>Decreased</td>
<td>Increased**</td>
<td>Decreased</td>
<td>Increased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poaching Behavior Indicators</th>
<th>The Indicator Indicated Poaching Behavior had:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Illegally Killed African Elephants</td>
<td>Decreased</td>
</tr>
<tr>
<td>African Elephant Population</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

*Table 7. Results of my research study. The table shows the indication (either increased or decreased behavioral intention to poach or poaching behavior) from each indicator for each occurrence in the sample of my study is shown.*
Analysis of Results

This section of the chapter summarizes the analysis of my findings and my discovered results. First, I conducted a cross-tabulation analysis of the correlation between ivory stockpile management strategies (ivory stockpile destruction or ivory stockpile sale) and behavioral intention to poach indications (increased or decreased) (see Table 8). It analyzed the frequencies of increased and decreased behavioral intention to poach indications for the occurrences of both ivory stockpile destruction and ivory stockpile sale. Significant results from the analysis would determine which stockpile management strategy correlated better with decreased behavioral intention to poach.

<table>
<thead>
<tr>
<th>Behavioral Intention to Poach Indications</th>
<th>Increased</th>
<th>Decreased</th>
<th>Number of Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivory Stockpile Management Strategy</td>
<td>Destruction</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Sale</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>15 (Total)</td>
<td>21 (Total)</td>
<td>36 (Total)</td>
</tr>
</tbody>
</table>

*Table 8. Completed cross-tabulation analysis of strategy and behavioral intention to poach. This table is the 2x2 analysis of my measured frequencies for each combination of the variables.*

Similarly, I conducted a cross-tabulation analysis of the correlation between ivory stockpile management strategies (ivory stockpile destruction or ivory stockpile sale) and poaching behavior indications (increased or decreased) (see Table 9 on next page). It analyzed the frequencies of increased and decreased poaching behavior indications for the occurrences of both ivory stockpile destruction and ivory stockpile sale. Significant results from the analysis would determine which stockpile management strategy correlated better with decreased poaching behavior.
Poaching Behavior Indications

<table>
<thead>
<tr>
<th>Ivory Stockpile Management Strategy</th>
<th>Increased</th>
<th>Decreased</th>
<th>Number of Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destruction</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Sale</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>6 (Total)</td>
<td>6 (Total)</td>
<td>12 (Total)</td>
<td></td>
</tr>
</tbody>
</table>

Table 9. Completed cross-tabulation analysis of strategy and poaching behavior. This table is the 2x2 analysis of my measured frequencies for each combination of the variables.

For each cross-tabulation analysis, I calculated the Fisher’s exact test statistic to determine if the found correlations were significant. The Fisher’s exact probability score for the cross-tabulation analysis of behavioral intention to poach and ivory stockpile management strategies was $p = 0.49911$, meaning it was statistically non-significant because it was not $p < 0.05$. The Fisher’s exact probability for the cross-tabulation analysis of poaching behavior and ivory stockpile management strategies was $p = 0.545455$, meaning this, too, was statistically non-significant because it was not $p < 0.05$.

A cross-tabulation analysis assumes the null hypothesis of no correlation existing between the two variables (Babbie, 2010). In general, to reject the null hypothesis, the p value must be statistically significant at $p < 0.05$ meaning it is 95% certain that the findings were not due to chance (Babbie, 2010). The Fisher’s exact probability score values for both of my cross-tabulation analyses were approximately 0.5. This means that I cannot reject the null hypothesis because there is an approximately 50% possibility in both cases that the frequencies in my tables occurred by chance. I could not find with statistical certainty which or, if at all, ivory stockpile management strategy – (a) ivory stockpile destruction or (b) ivory stockpile sale – is correlated better with decreased behavioral intention to poach and decreased poaching behavior. Therefore, I am unable to answer my research question with statistical certainty.
Summary of Results

Overall, the findings of my study were inconclusive and statistically non-significant. I am unable to directly answer my research question: which elephant ivory stockpile management strategy used by African elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with decreased behavioral intention to poach as well as decreased poaching behavior? However, this does not nullify the value of my research study, its methods, and its findings. My research study is able to still contribute to the research field on this topic. This will be further discussed in the next chapter.
CHAPTER 5: DISCUSSION

This chapter discusses the importance of my research study and its results. My research study sought to explore and answer my research question: which elephant ivory stockpile management strategy used by African elephant range states correlates better with more effective combatting of the illegal ivory trade, operationalized as decreased behavioral intention to poach as well as decreased poaching behavior? The analysis of my findings revealed that my results were statistically non-significant and inconclusive. I was unable to answer my research question with statistical certainty. However, my study still valuably contributed to the research on this topic.

First, the major contributions of my research study and its results will be discussed within this chapter. My research study offers a way to bridge the current gap in the literature while my results direct the focus of future research within this field. Also, my study and its results provide foundational research supporting the use of a united, cooperative ivory stockpile management strategy by all African elephant range states. Secondly, the limitations of my research study are overviewed in this chapter. I was willing to recognize and accept these limitations because, despite the risks of conducting my research study, it offered important contributions to the current research within this field.
Discussion of Results

My research study and its results offer three major contributions to the literature within this field. The first contribution is that I designed a new research methodology providing results able to bridge the current gap (no direct comparison of the strategies determining which is more effective) in the literature on ivory stockpile management strategies. The second contribution is that my results direct the focus of future research on this topic. Although I found non-significant results, I observed important trends requiring further research by future studies. The third contribution is that my methodology and results provide foundational research for future studies to provide statistical evidence of the most effective ivory stockpile management strategy. This evidence is crucial in order for African elephant range states to change their governmental policies to the use of a united, cooperative ivory stockpile management strategy. This collective action is necessary in order to most effectively combat the illegal ivory trade and eradicate its devastating implications. Next, each of these contributions will be discussed in detail.

Designed a New Methodology to Bridge the Gap in the Literature

The first major contribution of my study is its uniquely designed methodology. My methods were designed to provide results able to bridge the current gap in the literature. After reviewing the literature, I found that most studies had independently researched ivory stockpile strategies. Research studies either evaluated the impact of ivory stockpile sales or evaluated the impact of ivory stockpile destructions. Direct comparisons of the two strategies in order to determine which is more effective had not been made leaving a gap in the current literature. Harvey (2015) was the only potential exception to this as he used a game theory model to determine the best way for African elephant range states to combat the illegal ivory trade. One of the many issues addressed within his model was ivory stockpile management by African
elephant range states. His model determined that they should collectively use an ivory stockpile
destruction strategy instead of ivory stockpile sale. However, his determination was based on a
model and ideal reality. Therefore, my research study contributes to the literature by providing a
new methodology to make actual direct comparisons of the two ivory stockpile management
strategies and determine which strategy is more effective.

In order to make this comparison and determination, my methodology was uniquely
designed. Although my methodology is unable to show causal relationships, it determines which
strategy is correlated better with effective combatting of the illegal ivory trade. To ensure my
new methodology accurately determines which strategy is more effective, my design provided an
exhaustive operationalization and thorough measurement of my construct – effective combatting
of the illegal ivory trade. My application of Ajzen’s (1991) theory of planned behavior allowed
me to create an exhaustive operationalization of this construct. The most effective strategy was
determined by my study to be the one correlated better with addressing the root causes of
poaching thereby preventing future poachers from poaching (decreased behavioral intention to
poach) as well as addressing the immediate need to stop the illicit activities of current poachers
(decreased poaching behavior).

Additionally, my methodology used a thorough measurement of this construct – effective
combatting of the illegal ivory trade – which was operationalized by my study as decreased
behavioral intention to poach and decreased poaching behavior. My methodology measured
multiple indicators (archival data sets from various sources) to determine the directional change
(increased or decreased) of behavioral intention to poach and poaching behavior correlated with
each occurrence of either ivory stockpile destruction or ivory stockpile sale in the sample of my
study over a five-year period. Then, my methodology used the combined indications (either
increased or decreased behavioral intention to poach or poaching behavior) from all occurrences of ivory stockpile destruction compared to the combined indications from all occurrences of ivory stockpile sale (accounting for the increased number of sale occurrences in my sample) to determine which strategy was correlated better with more effective combatting of the illegal ivory trade.

My new methodology captures a more accurate measurement of the directional change of my variables (behavioral intention to poach and poaching behavior) during the applicable five-year period for each occurrence of an ivory stockpile management strategy in my sample by having multiple indicators from various archival data sets sources collectively indicate the change in my variables. Alternatively, I found that many studies during my review of the literature had previously evaluated only a single indicator to determine the correlation or relationship between a specific ivory stockpile management strategy and effective combatting of the illegal ivory trade. For example, EIA (2012) evaluated only the price of ivory in Chinese markets to indicate the impact of ivory stockpile sale as either increasing or decreasing demand for ivory. Thus, price of ivory was used to indirectly show the impact of ivory stockpile sale on the illegal ivory trade. Also, CITES (2008) analyzed only the ivory seizure data reported by ETIS to determine the impact of its ivory stockpile sales on illegal ivory trade activity.

Overall, my methodology valuably allows direct comparison of the two ivory stockpile management strategies to determine which strategy is correlated better with my exhaustively defined and thoroughly measured construct – effective combatting of the illegal ivory trade. Related to the next contribution, the design and methods of my research study is available for future researchers to use and improve. Therefore, my contribution of a new methodology is greater than simply producing valuable results within my study.
Directs the Focus of Future Research

The second major contribution is that my results direct the focus of future research within this field. The trends (statistically non-significant correlations between my studied variables) I observed within my results contribute to the literature by identifying specific areas that require further research. I was unable to show if these trends were statistically significant due to my small sample size. Therefore, I was unable to reject the null hypothesis or, in other words, I was unable to rule out with significant certainty that my results did not simply occur by chance. Therefore, further research of these observed trends is important.

Although I was limited to a small sample size, it will be possible for a research study in the near future to repeat my methodology with a larger sample. For example, in the near future the sample size of my study could be nearly doubled. There are five occurrences of ivory stockpile destruction by African elephant range states that occurred in 2014 and 2015. The archival data necessary for them to be evaluated by my study’s methodology will be available in the near future. A research study repeating my methodology with a larger sample size will provide better statistical determination of my results and be able to show if any of the trends I observed are, in fact, statistically significant correlations between my variables. Additionally, future research should not be limited to using only my methodology to further explore these observed trends. To best explore these trends, researchers should also develop alternative ways to evaluate them and determine whether they are statistically significant correlations and causal relationships of importance. Therefore, my study and its results positively direct future research to focus on specific areas of interest I observed.

Each of the trends I observed will now be discussed. To reiterate, these trends are statistically non-significant correlations between my studied variables. My study’s results were
inconclusive and could not determine whether ivory stockpile destruction, ivory stockpile sale, or neither is correlated better with more effective combatting of the illegal ivory trade, operationalized as decreased behavioral intention to poach and poaching behavior. These observed trends could be from randomly occurred results. However, I strongly recommend further research be conducted to study the trends I observed because it appears important correlations may exist and need understood.

**Potentially neither strategy is correlated with decrease behavioral intention to poach.** The first trend I observed was that potentially neither ivory stockpile destruction nor ivory stockpile sale correlates with decreased behavioral intention to poach. For my cross-tabulation analysis of the correlation between ivory stockpile management strategies (destruction or sale) and intentional behavior to poach indications (increased or decreased) (see Table 8 in Chapter 4 on page 160), I did not observe any apparent trend when visually comparing the results. This could be due to another limitation of my study, which will be discussed later in this chapter, of my indicators not accurately measuring the variable.

Alternatively, this observed trend could suggest that neither strategy is associated with decreased behavioral intention to poach. This is concerning because it is important for an effective strategy to be not only associated with decreasing poaching behavior but, also, be associated with decreasing the factors that encourage or facilitate poaching behavior (behavioral intention to poach). These factors include poverty, weak governance, corruption, poor implementation of CITES into national legislation, and subjective norms competing with elephant conservation. It is important for implementation of an ivory stockpile management strategy to correlate with reduction of these root issues that are facilitating poaching of African elephants (the main supply of ivory within the illicit ivory trade). It would be beneficial for
future research to further explore the construct of behavioral intention, effective measurement of it, and its correlation with ivory stockpile management strategies.

Potentially ivory stockpile destruction is correlated better with decreased poaching behavior. The second trend I observed was that ivory stockpile destruction is potentially correlated better with decreased poaching behavior than ivory stockpile sale. This trend was observed in multiple ways throughout the results of my study. For example, my other cross-tabulation analysis was of the correlation between ivory stockpile management strategies (destruction or sale) and poaching behavior indications (increased or decreased) (see Table 9 in Chapter 4 on page 161). When visually analyzing the frequency table for this analysis, I observed a potential trend of occurrences of ivory stockpile destruction correlated better with decreased poaching behavior than occurrences of ivory stockpile sale. For occurrences of ivory stockpile destruction, 75% of the indications found by my two poaching behavior indicators were “decreased poaching behavior” (see Table 10 on next page). Alternatively, for occurrences of ivory stockpile sale, 37.5% of the indications found by my two poaching behavior indicators were “decreased poaching behavior” (see Table 10 on next page).

Additionally, this trend was observed when visually comparing all occurrences within in my sample and my found indications for them by my indicators (see Table 7 in Chapter 4 on page 159). In my opinion, one occurrence stood out compared to the rest. This occurrence was the only one to have decreased indicated by both of my poaching behavior indicators as well as to have decreased indicated by four out of my six behavioral intention to poach indicators. The other occurrences, including the other destruction occurrence, had one or no indication of decreased poaching behavior and had three or less indications of decreased of behavioral intention to poach. The occurrence of interest was the 2011 ivory stockpile destruction by Kenya.
Poaching Behavior Indications

<table>
<thead>
<tr>
<th>ivory stockpile management strategy</th>
<th>increased (percentage of indications)</th>
<th>decreased (percentage of indications)</th>
<th>number of indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>destruction</td>
<td>1 (25% of indications were increased for destruction occurrences)</td>
<td>3 (75% of indications were decreased for destruction occurrences)</td>
<td>4</td>
</tr>
<tr>
<td>sale</td>
<td>5 (62.5% of indications were increased for sale occurrences)</td>
<td>3 (37.5% of indications were decreased for sale occurrences)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>6 (total)</td>
<td>6 (total)</td>
<td>12 (total)</td>
</tr>
</tbody>
</table>

Table 10. Percentage of indications found comparing strategy and poaching behavior. The table shows the frequency as well as the percentage of the indications found for each combination of the variables, strategy and poaching behavior.

Related to this observed trend, Harvey’s (2015) game theory model determined the most effective ivory stockpile management strategy to combat the illegal ivory trade for African elephant range states is collective action to destroy their ivory stockpiles or at least put their stockpiles beyond commercial use. Yet as shown by my literature review, there are many opponents of ivory stockpile destruction arguing it is an ineffective strategy while there are many proponents of ivory stockpile sale arguing it is the most effective strategy. Thus, it is important to reiterate that this observed trend is based on statistically non-significant and inconclusive results. Also, there may be other confounding variables that influenced this observed trend instead of an existing correlation between my measured variables. Considering the research findings of Harvey’s (2015) study, I strongly advise further research to determine which ivory stockpile management strategy is correlated better with decreased poaching behavior. That is the only way to determine if the observed trend of ivory stockpile destruction correlated better with decreased poaching behavior is or is not a significant correlation. Thus, future research is
necessary and very important, specifically a study repeating my methodology with a larger available sample size to better determine if my observed trend is statistically significant or not.

**Potentially the Appendix II listings for African elephant populations are outdated.** The third trend I observed was that the Appendix II listing of the four African elephant populations is potentially outdated. Four occurrences of ivory stockpile sale were included in the sample of my study. These sales were authorized by CITES because the elephant populations of these African elephant range states are listed as Appendix II. However, the downlisting of these elephant populations to Appendix II was based on assessments by CITES made nearly two decades ago in either 1997 or 2000. At that time, it was determined that these countries had well managed and protected elephant populations. I believe that the findings from some of my indicators for these four occurrences of ivory stockpile sales in 2008 suggest that this assessment, and thereby the appendix listing, is outdated. If so, a reassessment of the status of these populations should be conducted to ensure that the Appendix II listing by CITES is sufficiently protecting all four of these African elephant populations.

For example, two of my indicators measured the directional change of poaching behavior during the five-year period for each occurrence in my sample. My results for none of the four occurrences of ivory stockpile sale had both poaching behavior indicators find decreased directional change during their applicable five-year periods (see Table 7 in Chapter 4 on page 159). Each occurrence of ivory stockpile sale was found by an indicator to have either: (a) increased percentage of illegally killed African elephants (indicated by my findings showing an increasing trend line of the percentage of illegally killed African elephants in their county over the five-year period) or (b) decreased elephant population (indicated by my findings showing a decreasing trend line from the 2007 African elephant population count in their country to their
2013 count). Most alarmingly, the occurrence of the 2008 ivory stockpile sale by Botswana was found to have increased percentage of illegally killed elephants (see Figure 17 in Chapter 4 on page 156) and a decreased elephant population (see Figure 18 in Chapter 4 on page 158).

Additionally, another one of my indicators (national legislation meeting the requirements for implementation of CITES) found that Botswana did not, as of 2014, meet the requirements for full implementation of CITES into their national legislation (see Figure 14 in Chapter 4 on page 153). In my opinion, this observed trend suggests that Botswana’s African elephant population is no longer securely protected, and, therefore, the Appendix II listing of Botswana’s African elephant population by CITES should be reevaluated. Positively, Botswana may be addressing this concern. The country recently agreed to the 2014 Elephant Protection Initiative meaning it has stated it will not sell its stockpiled ivory for ten years (Harvey, 2015). I recognize that my findings are inconclusive, and, therefore, these trends may be based on frequencies collected by chance or influenced by confounding variables. However, I strongly encourage further research on the status of Appendix II African elephant populations. If this trend I observed is accurate, then these elephants populations are no longer well protected and that must be addressed.

Furthermore, the trend I observed suggesting that the Appendix II listings of African elephant populations needs to be reassessed is supported by current concerns and actions expressed in the literature, specifically by Harvey (2015) and the African Elephant Coalition (2015). Harvey (2015) argued that the elephant population in Zimbabwe is no longer as well managed and protected as it was in 1997, when the population was downlisted to Appendix II. He also calls for a reassessment of the statuses of all four Appendix II elephant populations.
Similarly, this trend has been expressed as a concern of the African Elephant Coalition [AEC] (2015). This coalition works to protect African elephants through the collective action of its member and observer states, which are twenty-five African elephant range states (African Elephant Coalition [AEC], 2015). None of the four countries with elephant populations listed as Appendix II are member or observer states. In November 2015, the twenty-five African elephant range states of the AEC met and agreed to the Cotonou Declaration (AEC, 2015). A main agreement of the Cotonou Declaration was support for a submitted proposal to CITES for the return of all African elephants to Appendix I status because the current poaching crisis is now threatening all populations of African elephants regardless of whether the population was previously secured and well-managed (AEC, 2015). The next meeting of CITES, where such a proposal for amendment of appendices would be considered, is in September of 2016 (CITES, n.d.).

Conclusively, my results valuably contributed by directing future research to focus on areas of particular interest within the field to determine if they are or are not significant correlations. I observed the following trends requiring further research: (a) potentially neither strategy is correlated with decreased behavioral intention to poach; (b) potentially ivory stockpile destruction is correlated better with decreased poaching behavior; and (c) potentially the Appendix II listing of some African elephant populations is outdated. Related to the next contribution of my study, my methodology and its results most importantly direct future research to focus on identifying the most effective ivory stockpile management strategy for combatting the illegal ivory trade.
Foundational Research Supporting the Use of a United, Cooperative Ivory Stockpile Management Strategy

The third major contribution is that my methodology and results provide foundational research for future studies to provide statistical evidence of the most effective ivory stockpile management strategy. My review of the literature clearly shows the effectiveness of these two different ivory stockpile management strategies is widely contested within the literature. This has resulted in the use of dichotomous strategies by African elephant range states. This is a problem as it is widely accepted that the most effective way to combat the illegal ivory and other wildlife trades is through united, cooperative approaches (Duffy & Humphreys, 2014; Harvey, 2015; Lawson & Vines, 2014; London Conference, 2014). Therefore, more research with conclusive results is necessary to end this long-held debate and move towards necessary collective action. My methodology and its results, with a greater sample size, will be able to concretely show which strategy is correlated with more effective combatting of the illegal ivory trade. By doing this, it directs future research efforts to explore my found correlations and further advance the research within this field.

The ultimate goal is through further research to provide statistical evidence for unanimous use of a united, collaborative strategy of ivory stockpile management by African elephant range states. There must be evidence showing which strategy is most effective at combatting the illegal ivory trade. Additionally, my review of the literature identified other areas that were beyond the scope of my research study but required further research. Specifically, future research needs to identify with statistical evidence how to incentivize collective action and have African elephant range states successfully implement a unanimous strategy to manage their ivory stockpiles. Only through further research and substantial evidence will African elephant
range states change their governmental policies dictating the management of their ivory stockpiles to a policy of united, cooperative ivory stockpile management. Most importantly, it is through this necessary collective action that the illegal ivory trade and its devastating global implications will then be most effectively combated (Duffy & Humphreys, 2014; Harvey, 2015; Lawson & Vines, 2014; London Conference, 2014). In summary, my study and its results valuably contributed to advancing the research within this field while fully recognizing and accepting it had limitations.
Limitations

I conducted an inductive, exploratory research study on the management of ivory stockpiles owned by African elephant range states used to combat the illegal ivory trade. I used a non-experimental design with a purposive sampling method. Therefore, I accepted numerous risks associated with my chosen design, particularly in regards to internal validity. While recognizing and accepting these limitations, I still chose to conduct my research study because it valuably offered foundational results that direct and support future research. The risks I accepted included: (a) measuring an illicit trade; (b) non-probability sampling method; and (c) my chosen indicators being unproven to indicate my intended constructs. Following is a discussion of each of these limitations and the steps I took to safeguard my study from these risks.

Measuring an Illicit Trade

First, I accepted the limitation of measuring an illicit trade. An illicit trade, including the illegal ivory trade, is by nature intended to avoid detection and quantitative assessment. My research study therefore accepts that it is extremely difficult to directly and accurately measure the illegal ivory trade. Furthermore, it is also difficult to indirectly measure the illegal ivory trade, such as measuring the percentage of illegally killed African elephants. It is difficult to accurately measure because it is: measuring an intangible construct; based on sparsely available data; requires the necessary use of extrapolation; and complicated by many confounding variables (Underwood, Burn, & Milliken, 2013; Wittemyer et al., 2014). However, the free, public online archival data sets that have measured the illicit trade directly and indirectly are the best estimations available.

As it is not possible for me to directly collect data for each of the indicators in my study, I chose to necessarily rely on these available archival data sets. As such, the internal validity of my
study is susceptible to the accuracy of each archival data set. In order to safeguard my study from this unavoidable risk, I measured at least two archival data sets (indicators) from various sources to indicate my variables: (a) behavioral intention to poach and (b) poaching behavior. As poaching behavior is more straightforward, I chose two indicators of it. Each indicator measured and coded a unique archival data set to indicate the directional change of poaching behavior (increased or decreased) for each occurrence in my sample over its applicable five-year period. Alternatively, behavioral intention to poach is less straightforward and more complex with three determinants that influence an individual’s intent to poach. Therefore, I chose six indicators of behavioral intention to poach. Each indicator corresponded to one of the three determinants of behavioral intention to poach. Also, each indicator measured and coded a unique archival data set to indicate the directional change of behavioral intention to poach (increased or decreased) for each occurrence in my sample over its applicable five-year period. Related to the reliability of my study, each of my indicators measured a free, public online archival data set. Since these data sets are freely available and each of my indicators is thoroughly operationalized, another researcher could accurately replicate and feasibly repeat my methodology in a future research study.

Non-Probability Sampling Method and Small Sample

Second, I accepted the limitation of using non-probability sampling method and studying a small sample. Specifically, my study committed selection bias by using a non-probability sampling method. This risk was outweighed by the benefits of studying a certain and small sample from my population. My study used purposive sampling to select six occurrences from a small population of seventeen ivory stockpile destructions and sales that had occurred since the ivory trade ban of 1989 through 2015. Also, I recognized that a small sample threatens the
external validity of my research study because my findings are less likely to generalize to the whole population. However, my purposive sampling provided a sample that guaranteed each occurrence had sufficiently available archival data necessary to conduct my analysis. By being able to thoroughly analyze the findings for my sample, I was able to explore and identify important correlations. Since I was conducting an inductive, non-experimental study, I was not interested in identifying causal relationships. The purpose of my research study was to use observed trends, ideally statistically significant, to provide a foundation for and direct future research.

**Untested Indicators**

Third, I accepted the limitation of my indicators being untested. Since it is unproven whether my indicators accurately indicate either behavioral intention to poach or poaching behavior, this limitation threatens the internal validity of my study. I did not statistically test each of my indicators to determine their ability to accurately indicate the construct I intended. Recognizing this as a potential limitation is important, but it does not mean that my study should not have used these indicators. Rather, by understanding the threat of this uncertainty, I actively sought to safeguard my study from this risk.

All of my indicators and the source of their archival data sets were chosen by me after thoroughly reviewing the literature on this topic. The literature suggested and, often, showed the archival data sets (measured by my indicators) were indicative of my operationalized variables of behavioral intention to poach and poaching behavior. The rationale of my choice for each indicator and the relevant literature supporting my choice are outlined in each indicator’s operationalization (see Chapter 3).
Also, my study recognizes the internal validity risk from possible confounding variables and extraneous factors that may have influenced my indicators and their findings. Although it is important to recognize all these limitations, which were often unavoidable, it was still valuable to conduct my study and explore my research question. As my non-experimental study was exploratory in nature, it is less concerned with these risks as it is not seeking to find causal relationships. Instead, its purpose is to explore for correlations and, therefore, direct future research efforts to experimentally determine relationships and control for extraneous factors.

Overall, my research study faced multiple risks. However, the substantial benefits provided by conducting it made recognizing and accepting these risks worthwhile. My study and its results positively contributed to the literature on this topic by offering a methodology to bridge the gap in the literature. My research also foundationally directs and supports the future research necessary to provide statistical evidence for African elephant range states to change their governmental policies on management of ivory stockpiles towards collective action. Only after substantial research and evidence will African elephant range states shift from their current use of dichotomous ivory stockpile management strategies to a united and cooperative ivory stockpile management strategy. Yet, this collective action is necessary to most effectively combat the illegal ivory trade and to eradicate its devastating implications. Next, my final chapter will present a summary of both my conclusions and my recommendations for future research.
CHAPTER 6: CONCLUSION

In this chapter, I present my conclusions and recommendations for future research. These serve to encourage and direct future research towards providing the necessary substantial findings and concrete evidence for the development of a united, collaborative approach of ivory stockpile management unanimously used by African elephant range states. Through their collective management of ivory stockpiles, they will be more effective at combatting the illegal ivory trade and eradicating its devastating global implications.
Conclusions

After thoroughly reviewing the literature and analyzing the results of my research study, I have concluded:

- The illegal wildlife trade is a growing transnational illicit trade. Comparable to illicit drug trafficking and human trafficking, the illegal wildlife trade is a serious crime with global implications. Its devastating social, economic, national and international security, and health implications threaten human security and international development around the world in addition to its well-known threat to the survival of wildlife species. One of the most illicitly traded products within the illegal wildlife trade is elephant ivory.

- The illegal ivory trade is fueled primarily by a high demand for ivory in China and supplied primarily by unsustainable poaching of African elephants. Yet, ivory from unsecure, poorly managed ivory stockpiles, also, supplies the illicit ivory trade. Stockpiled ivory owned by African elephant range states frequently enters or renters the illicit trade after being robbed from unsecure stockpiles or misappropriated by corrupt officials.

- African elephant poaching and the illicit ivory trade have dramatically increased since 2007. As of 2011, poaching was unsustainable with the total poaching rate in Africa exceeding the growth rate of the total African elephant population.

- The devastating impact of the illegal ivory trade goes beyond threatening the African elephant population. The illicit trade is associated with corruption, weak law enforcement, poor governance, poverty, violence, and large organized criminal syndicates, including terrorists groups. Thus, the illicit ivory trade undermines and threatens the social, economic, and national security of African elephant range states as
well as poses an international security threat. It is necessary to effectively combat the illegal trade of ivory.

- Recently recognizing the full implications of the illegal wildlife trade, the international community has called for collective action to combat the illegal trade of wildlife and their products, specifically the illicit trade of ivory. This culminated in the 2014 London Declaration on the Illegal Wildlife Trade [London Declaration]. The declaration outlines united, cooperative strategies to be collectively carried out by the international community in order to eradicate the illegal wildlife trade. It is accepted that the most effective way to combat the illegal wildlife and ivory trades is through united, cooperative actions. However, it is not an easy feat as there are many barriers to effectively combatting the illegal wildlife and ivory trades.

- One of the many necessary collective actions to combat the illegal ivory trade is proper management of legal government-owned ivory stockpiles, especially stockpiles owned by African elephant range states. These states are not collectively using one ivory stockpile management strategy; instead, African elephant range states are using two different ivory stockpile management strategies – (a) ivory stockpile destruction and (b) ivory stockpile sale. This dichotomy threatens effective combatting of the illegal ivory trade as it goes against the necessary use of a united, cooperative approach.

- My review of the literature found that the effectiveness of these two ivory stockpile strategies is widely debated and inconclusive. Furthermore, the international community contradicts itself by, on one hand, calling for one strategy – ivory stockpile destruction – in the London Declaration while, on the other hand, allowing use of the other strategy – ivory stockpile sale – through CITES-authorized one-off ivory stockpile sales. This
contradiction further threatens effective combatting of the illegal ivory trade.

- Only through substantial research and evidence can the international community and African elephant range states shift from their current dichotomies and build agreement for unanimous use of a united, cooperative ivory stockpile management strategy, which is necessary to most effectively combat the illegal ivory trade.

- My master thesis explored the use of dichotomous ivory stockpile management strategies by African elephant range states. My research study sought to answer the following question: which elephant ivory stockpile management strategy used by African elephant range states – (a) ivory stockpile destruction or (b) ivory stockpile sale – correlates better with more effective combatting of the illegal ivory trade, operationalized as decreased behavioral intention to poach as well as decreased poaching behavior? Although I was unable to directly answer my research question with statistical certainty, my research study still positively contributes to the current literature and research.

- My research study contributed by designing a new research methodology able to bridge the current gap in the literature while the trends I observed within my statistically non-significant results contributed by requiring further research thus directing the focus of future research within the field. Additionally, my study and its results provided foundational research for future studies to provide statistical evidence of the most effective ivory stockpile management strategy. This evidence is crucial in order for African elephant range states to change their governmental policies and use a united, cooperative ivory stockpile management strategy. Yet, this collective action is necessary in order to most effectively combat the illegal ivory trade and eradicate its devastating implications.
Recommendations for Future Research

After conducting a thorough review of the literature as well as conducting my research study and evaluating its results, I make the following major recommendations for future research.

Recommendation 1: Determine the Most Effective Ivory Stockpile Management Strategy

I recommend that future research determine which ivory stockpile management strategy is the most effective at combatting the illegal ivory trade to bridge the current gap in the literature. I specifically recommend that a future research study repeat my methodology when a greater sample size of ivory stockpile destruction and sale occurrences is available. Using a greater sample size will allow for better determination of whether statistically significant correlations may exist. Also, I recommend that the trends I observed within my statistically non-significant results be further researched (see Chapter 5). However, I do not recommend that future research be limited to only using my methodology. I encourage exploration of other methods as well as other related topics, particularly those that were beyond the scope of my study. For example, further research is necessary to understand the economic and political factors that influenced and continue to influence African elephant range states’ use of dichotomous ivory stockpile management strategies. Overall, future research to compare and determine the most effective ivory stockpile management strategy is important because it will: (a) bridge a gap in the literature; (b) conclusively end the long-held debate over which strategy is more effective; and (c) provide substantial findings and evidence in support of the unanimous use of a united, cooperative ivory stockpile strategy by all African elephant range states, which is necessary to most effectively combat the illegal ivory trade.
Recommendation 2: Reassess the Appendix II Status of African Elephants

I recommend future research accurately reassess the status of the four African elephant populations listed by CITES as Appendix II. This reassessment is important because the trends I observed within my results as well as other researchers suggest that some of these African elephant populations may no longer be well protected from the impacts of the illegal ivory trade (AEC, 2015; Harvey, 2015). If any of the four Appendix II African elephant populations are shown through concrete evidence to no longer be well protected, it will be possible to successfully petition CITES to reassess their status and, as necessary, return any threatened populations to the protection of an Appendix I listing. My findings were not statistically proven, and, therefore, they may not be accurate but regardless further research is important to ensure the protection of this species. Additionally, this observed trend is not necessarily suggestive of the effectiveness of the ivory stockpile sale strategy. Instead, it simply suggests a country should maybe no longer be authorized to sell their ivory stockpiles because the authorization was determined based on an outdated status of their African elephant population.

Recommendation 3: Greater Collective Action to Combat the Illegal Ivory Trade

I recommend, in general, for future research to continue to educate and encourage the international community, governments, intergovernmental organizations, non-governmental organizations, and local grassroots efforts to collectively work together using united, cooperative strategies to combat the illegal ivory and other wildlife trades. Thereby, it ensures the survival of these vital species as well as prevents these illicit trades from continuing to threaten human security and international development.
ACKNOWLEDGMENTS

I would like to express my sincerest gratitude to Dr. Mihail Iordanov from Concordia University for his excellent supervision and insights. Additionally, I would like to thank all of my professors, family, and friends that endlessly supported me throughout the completion of my master program and master thesis. I especially want to thank my parents, Timothy and Donna Brecht, as well as Mark Brecht, Analise Zocher, and Holly Brecht.
REFERENCES


Messone, N.N., & Wittig, P. (2013, October 28). Outcome of the high-level discussion on:


Rosen, G. E., & Smith, K. F. (2010). Summarizing the evidence on the international trade in


APPENDIX A

IRB Proposal

Concordia University–Portland IRB

**Step 1. Research Description Form**

The purpose of this form is for you to describe your potential research project to determine if you need to have institutional review board (IRB) review. Within one week after you submit this completed form, you will either receive a letter stating your research is "exempt" from review (Letter of Exemption) or you will receive instructions on how to proceed with your CU-p IRB review (IRB Review Required). Click on a grey box; type your answer (the example text will be replaced with your typing), then email completed form to the CU-p IRB at irb@cu-portland.edu.

<table>
<thead>
<tr>
<th>Researcher, called principal investigator</th>
<th>Brecht, Heather</th>
<th>Date submitting this form</th>
<th>09/14/2015</th>
</tr>
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<tbody>
<tr>
<td>e-mail</td>
<td><a href="mailto:heatherbrecht@gmail.com">heatherbrecht@gmail.com</a></td>
<td>Institution if not CU-Portland</td>
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<tr>
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<td>Another key researcher, if applicable</td>
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<tr>
<td>Faculty Advisor</td>
<td>Iordanov, Dr. Mihail</td>
<td>CU-Portland Department</td>
<td>MAIDS</td>
</tr>
<tr>
<td>Proposed Study Title</td>
<td>Combatting the Illegal Wildlife Trade</td>
<td></td>
<td></td>
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</table>

1. **In few sentences, describe your proposed research purpose and geographic location.**

Purpose and/or problem to be investigated: This proposed research seeks to evaluate the illegal wildlife trade. This study will look at trends related to the illegal trade of elephant ivory and shark fin/meat overtime as well as the projects and their strategies used to combat these illegal trades.

Geographic location and/or target population group and/or recruitment organization: This proposed research will collect and analyze archival data, such as news sources or public website information.

2. **Describe how you intend/hope to use the data/results.**

Type or write "X" on all and any that apply.

- x Dissertation or Thesis
- Journal or Article
- Conference or Seminar
- Grant Application
- News story, historical book, biography, or personal-opinion piece (not generalizable knowledge)
- None of these

3. **Which describes the research data/sample collection type(s).**

You can answer "True" to more than one. If you are not certain, you can write "don’t know." If not applicable, write "N/A."

<table>
<thead>
<tr>
<th>Question</th>
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<tr>
<td>D2</td>
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</table>

Answer Questions 4–7 by writing “Yes,” “No,” “N/A,” or “don’t know.” (It is okay to write “don’t know” at this stage of your research development. If the CU-p IRB requires more information, the CU-p IRB will contact you.)
4. Does the research require secret or misleading/deceptive data collection?

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<th>Question</th>
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<tr>
<td>4.1</td>
<td>If you are collecting private (non-public) information, even if collecting in a non-person-specific manner, will the individuals know that you are collecting data and would you be able to answer a reasonable question from a participant regarding what or why his/her data is being collected?</td>
<td>N/A</td>
</tr>
<tr>
<td>4.2</td>
<td>Does the study include (require) some deception or deceit in the recruitment or participation? Answer this even if the data collected is non-person-specific and/or considered public behavior. E.g.: a study of how bystanders respond to a car accident (which is staged/fake).</td>
<td>FALSE</td>
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5. Is there only a minimum risk to the participant in recruitment and/or study procedures?

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<tr>
<td>5.1</td>
<td>Is the study a minimal psychological and social risk? &quot;Yes&quot; would mean that the procedures/questions are NOT of a sensitive nature and you do not expect risks to personal self-image, social standing or bias, employment options, and/or legal liabilities.</td>
<td>YES</td>
</tr>
<tr>
<td>5.2</td>
<td>Is the study a minimal physical risk? &quot;Yes&quot; would mean that the procedures/questions are NO more painful, stressful, embarrassing and/or time consuming than a physical exam. E.g., a tube of blood, a stress test, and/or questions that many doctors would ask in that culture.</td>
<td>YES</td>
</tr>
<tr>
<td>5.3</td>
<td>Is there a minimal recruitment and enrollment risk? &quot;Yes&quot; would mean that people who might benefit from the outcomes of the research are involved in an equitable way that is voluntary and free of coercion. Equitable means that the risks and benefits are shared, and this is difficult for/in vulnerable populations. For this reason, you must answer &quot;No&quot; if your study includes vulnerable populations, such as prisoners, workers/students feeling coercion to participate, pregnant women, fetuses, and/or children.</td>
<td>YES</td>
</tr>
<tr>
<td>5.4</td>
<td>Is the study embarking into new and unprecedented “territory” because of novel and unprecedented procedures and research topics or new uses of a test, device, food, or drug? If there is no precedent, the study is NOT a minimal risk, and you must mark your answer “No.”</td>
<td>NO</td>
</tr>
</tbody>
</table>

6. Is it reasonable to expect that the investigator might be compelled/forced/required to disclose a participant’s identity?

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Answer</th>
</tr>
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<tbody>
<tr>
<td>6.1</td>
<td>Is there a significant chance, either because of the population being recruited or the questions being asked, that the investigator will learn that a participant is in serious immediate danger of abuse or neglect, of harming him/herself, or of harming someone else?</td>
<td>N/A</td>
</tr>
<tr>
<td>6.2</td>
<td>Is there a significant chance that the investigator will hear (learn of, observe) a participant (describe (report) or engage in (display) criminal behavior or extreme social or employment rule-breaking in which the investigator could be summoned in a criminal or civil legal investigation?</td>
<td>N/A</td>
</tr>
</tbody>
</table>

7. If this is educational research (classroom research) answer the following questions?

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
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<tbody>
<tr>
<td>7.1</td>
<td>Will your study be conducted using standard and conventional educational tests that are in a simple “question-answer” form? If the study includes open-ended questions that occur in interviews or group interactions, then mark this as “No” and answer the next question “Yes.”</td>
<td>NO</td>
</tr>
<tr>
<td>7.2</td>
<td>Will your study include open-ended questions/interviews (investigator-participant) or group (participant-participant) interactions?</td>
<td>NO</td>
</tr>
<tr>
<td>7.3</td>
<td>Is there a significant chance that interactions could reveal abuse, bullying or neglect? This could occur if the study includes students considered in social-economic-performance at-risk groups. This is similar to and overlaps with issues described in question 6, above.</td>
<td>NO</td>
</tr>
<tr>
<td>7.4</td>
<td>Is the person undergoing the study procedures a child? The procedures might include accessing or collecting their records and/or taking tests, answering questions, and/or interacting with an investigator in an interview. A child is usually defined as a minor &lt; 18 years old.</td>
<td>NO</td>
</tr>
<tr>
<td>7.5</td>
<td>Will your study be conducted within a Federally funded K-12 school educational setting? An example is any US Department of Education primary or secondary school.</td>
<td>NO</td>
</tr>
<tr>
<td>7.6</td>
<td>If your study will be conducted in a Federally funded K-12 school, can you reasonably expect and document the parents/guardians’ permission (consent) to adding this assessment/evaluation to the child’s school work/activities?</td>
<td>NO</td>
</tr>
</tbody>
</table>
DATE: *October 14, 2015
TO: Heather Brecht
FROM: Concordia University – Portland IRB (CU-p IRB)
PROJECT TITLE: *Combating the Illegal Wildlife Trade

REFERENCE #: RDF-20150915 Brecht, complete submission on 20151014
ACTION: DETERMINATION OF EXEMPT STATUS: Letter of Exemption
DECISION DATE: October 14, 2015
REVIEW CATEGORY: Exemption category # 4 (see below)

Thank you for your submission of RDF materials for this project. The CU-p IRB has determined this project is EXEMPT from the rules and regulations that are described in the Federal Regulations 45 CFR 46 (http://www.hhs.gov/ohrp/policy/ohrpregulations.pdf).

Your research has been approved by the CU-p IRB as Exemption category #4 research. The researcher is responsible to conduct research, even if it is exempt, with integrity and care. You are encouraged to continue to work with the CU-p IRB Office and involve others at Concordia University as necessary and prudent in your research.

If you have any questions, please contact Dr. OraLee Branch at obranch@cu-portland.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed, on October 14, 2015, in accordance with all applicable regulations, and a copy is retained within Concordia University’s records.

Exemption Category #4:
The research is limited to the collection or study of existing data, documents that are publicly available and/or pre-existing specimens where the subjects have not, cannot and will not be identified, directly or through identifiers linked to the subjects. The research is not involving prisoners, deceptive practices, coercion, FDA matters, medical records, or embryonic cell lines.

*This is an update of this letter, with update being March 17, 2016. The title has been corrected to Combatting the Illegal Wildlife Trade. This was the title and researcher in the original decision. The same exemption continues.

This letter has been electronically signed, on March 17, 2016 in accordance with all applicable regulations.
APPENDIX C

List of Figures and Tables

Chapter 2: Literature Review

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Chapter 4: Results

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<td>Adult literacy rate.</td>
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<td>African elephant population.</td>
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<td>Results of my research study.</td>
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<tr>
<td>160</td>
<td>8</td>
<td>Completed cross-tabulation analysis of strategy and behavioral intention to poach.</td>
</tr>
<tr>
<td>161</td>
<td>9</td>
<td>Completed cross-tabulation analysis of strategy and poaching behavior.</td>
</tr>
<tr>
<td>170</td>
<td>10</td>
<td>Percentage of indications found comparing strategy and poaching behavior.</td>
</tr>
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