HIGH SCHOOL EDITION
Journal of Student Research
Volume 11 Issue 4 (2022)

# Analysis of the Ivory Trade in Southern Africa: Animal Populations, Economics, and Government

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## ABSTRACT

The current nature of the ivory trade and elephant conservation within Southern Africa is unsteady and affected by fluctuating political and economical instability. The goal of this work is to conduct an unbiased investigation of how the ivory trade impacts animal populations, economies, and governments in Southern Africa. The ivory trade stems from a variety of factors, including governmental negligence, high demand for ivory in Asian markets, and the lack of alternative earnings for low-income communities. Besides, this research also considers global legislation to combat the current illicit African ivory trade and the effect of these mandates on animal populations, economies, and governments of African countries. Through such examination, this report aims to propose a concept for new mandates based on general findings, and observe general government influence on the ivory trade in Southern Africa.

## Introduction

The African ivory trade is the source of one of the world's largest black markets, and it is valued at tens of billions of dollars annually. It is directly linked to black markets in Asia, and fluctuations in the ivory economy negatively affect animal populations and can lead to governmental instability. Terrorist groups such as the Lord's Resistance Army depend on the ivory trade to fund their operations, which create political instability, harm communities, and topple governments such as the Central African Republic. Moreover, as the animals grow more scarce, the threat of extinction looms and poachers will go to greater lengths to fulfill demand. Factors that heavily influence the sale of ivory are governmental negligence, high demand for ivory in Asian markets, and a lack of alternative earnings for low-income communities. Lawmaking bodies such as CITIES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) have the power to pass international mandates, often undermining the positive effects that the sale of ivory has on the economy of source countries. CITIES placed a 9-year moratorium on the sale of legal ivory in 1989, which could have minimized the illicit market globally. In response, governments of Southern African countries such as Tanzania and Zambia forged carcass report data as poaching benefited the economy (Wasser et al. 2010). However, governments of nations such as Kenya are passing strict anti-poaching laws and are burning their ivory stockpiles. Southern African countries have varying viewpoints on the illicit and legal ivory trades, often due to internal corruption and possible profit.

This analysis can fill in a gap in the current research by combining many viewpoints and forming a diverse perspective on the ivory trade. It is crucial to balance the needs of African countries and the instability that the ivory trade creates in the global economy. This research paper will investigate the effects of the ivory trade on rhino and elephant populations in Southern Africa, and how poaching affects the economies and governments of these countries. Finally, this study will analyze the steps that governments and global agencies are taking to prevent the illicit ivory trade, and a concept for a new series of mandates bridging the gap between the interests of CITIES and African governments will be proposed.

## Methods

Research regarding the ivory trade was conducted using secondary data from online research reports and academic journals. The objective of the analysis was to observe how poaching and anti-poaching regulation affected animal populations, economies, and governments in Southern Africa. Data were evaluated using factors such as randomness, take levels from populations, and fluctuations in breeding. Regarding the subcategories of economics and government; variables of political instability, community involvement, the effectiveness of CITIES mandates, and profit were observed. This data originated from empirical research experiments, computer simulations, and statistical information. Other researchers in the field whose work contributed to this report used simulated computer models, conducted live experiments in national parks, and investigated criminal activity on the ground. Their work was completed from the period of 1997-2020.

Academic researchers Lusseau and Lee (2016) used empirical computer-simulated data, in attempts to propose a legal ivory trade. They did not account for external factors and used the factors of population, randomness, and poaching rates. Using elephant populations from Amboseli in Kenya, elephants were split by gender and age, and the model continued for 100 years. This simulation was repeated 1000 times, for each combination of take level and hunting and quota scenarios. Lusseau and Lee used a two sex-stochastic age-structured model and violin plots to illustrate their work. It was revealed that a legal ivory trade was not sustainable, because the probability of extirpation increased exponentially to minimal fluctuations in mortality levels. Conversely, in a live experiment, wildlife officers Bradley Anderson and Johan Jooste (2014) investigated the proportionality of increasing wildlife rangers with decreasing poaching rates in South Africa's Kruger National Park. The dependent variable was the health and number of rhinos in Kruger, depending on fluctuations in poaching rates. Community involvement was a secondary control factor, and an increase in poaching and protection technology. It was found that the pace of poaching at Kruger was 22% less than expected and there was a 200% increase in the annual amount of poachers arrested. Published in *National Geographic*, "How Killing Elephants Finances Terror in Africa" (2015) detailed journalist Bryan Christy's efforts to track counterfeit elephant tusks while documenting the ivory transportation process. Christy followed the tusks to Joseph Kony's Kafia Kingi headquarters, to expose the LRA's trafficking network. He interviewed a defector who demonstrated how the LRA uses ivory to fund its operations and spread political instability. Christy revealed that the LRA had close relations with the group Seleka in Sudan, and potentially has contacts with terrorist groups ISIS and Boko Haram. The integrative thread among these articles is that they involve the variables of the ivory trade and elephant populations, the ivory trade being the control, and elephant populations being the dependent. The authors of these sources come from diverse backgrounds, and they used different research methods to offer unique viewpoints on the ivory trade.

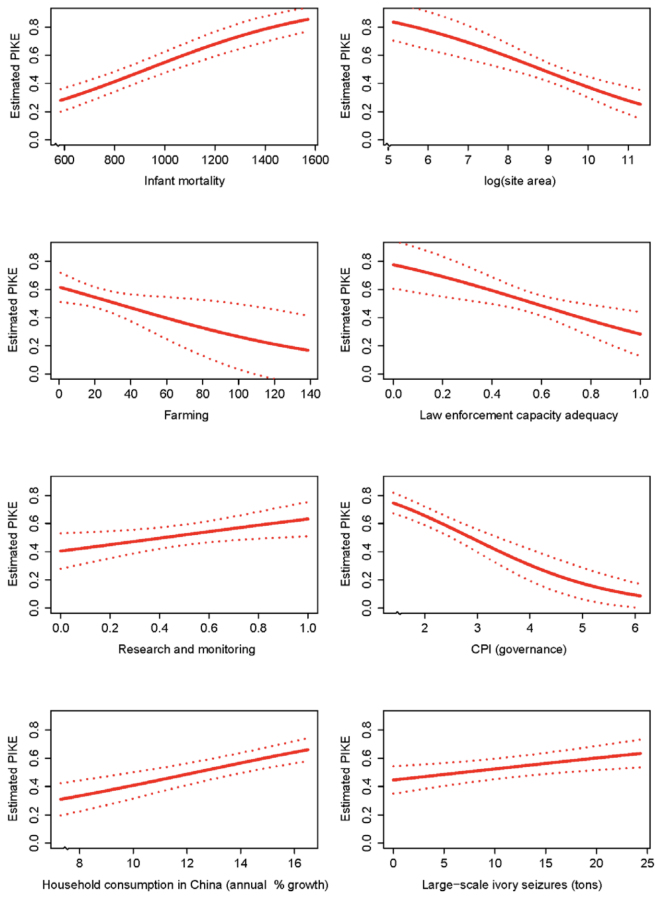
The secondary research process used in this work incorporates data from varied backgrounds, to fulfill the research goal of understanding the ivory trade from multiple perspectives. Empirical and secondary research can provide breakthroughs, or build on prior conclusions. However, the need to abide by ethical boundaries and the usage of original ideas remains constant. Through such examination, this report aims to propose a series of new mandates based on general findings, and observe general government influence on the ivory trade in Southern Africa.

## Findings

This research investigates the effects of the ivory trade on rhino and elephant populations in Southern Africa, and how poaching affects the economies and governments of these countries. Through such examination, this report aims to propose a series of new mandates based on general findings, and observe general government

influence on the ivory trade in Southern Africa. The following seven reports are specific and directly relate to the research question while approaching it from multiple perspectives. They discuss animal population, gov-

Figure 3. Relationships between covariates and PIKE while holding other covariates constant at their means.
Dotted lines represent 95 % confidence bands.

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ernment involvement, and economic effects. The following are the results of each study as presented by the researchers.

## Animal Population Decrease

"Elephant populations do not usually increase at rates much greater than 5% per annum. The upper ranges of the estimated losses exceed this figure, and it is therefore likely that elephant populations across all four African regions are in net decline" (CITIES, 2013).

CITIES Convention on International Trade in Endangered Species of Wild Fauna and Flora. (n.d.). *Monitoring the Illegal Killing of Elephants* (CITIES Secretariat, Author). CITIES. https://www.savetheelephants.org/wp-content/uploads/2014/02/E-CoP16-53-01.pdf

**Figure 1.** This chart shows relationships between covariates while holding other variables constant at their values. These covariates are the elements of the research that were directly impacted by poaching rates, such

as motivating drivers for poaching. The effects of PIKE (Proportion of Illegally Killed Elephants) are tested on each variable while holding all other variables at a constant rate. This demonstrates how the importance of variables fluctuates as the level of elephants poached changes, and that this increases proportionally with negative factors.

## Government Corruption

"Yet, Zambia and Tanzania are among the largest sources of, and transit countries for, Africa's illegal ivory...Zambia and Tanzania were among the most heavily involved in this trade during each peak; they also petitioned CITIES to downlist their elephants in those same years" (Wasser et al., 2010).

"In recent years, Tanzania and Zambia have become less transparent about population sizes and poaching-related mortalities. Three weeks before the CITES decision, information on Tanzanian elephant population trends and mortalities was still unavailable, impeding scientific assessment. Carcass counts, often an important metric of population trends (20), were either not collected or inaccurate in many recent aerial surveys" (Wasser et al., 2010).

## Significance of Poaching Prevention

"Wildlife trafficking is no longer just a conservation problem but has metastasized to a security problem. Together with international governmental and non-governmental partners, African states need to act more urgently to implement a strategy to slow and eventually reverse this fast-moving threat and protect their natural resources for future generations" (Anderson and Jooste, 2017).

## Motivating Factors Towards Poaching

"Furthermore, there are [several] enabling factors that encourage the IWT in Sub Saharan Africa which include: weak governance; corruption; failures in regulation; and failures in enforcement. Impacts on poor countries and people in Sub Saharan Africa from the IWT are not well studied or fully quantified" (Price, 2017).

## Possibility of A Legal Ivory Trade

"For all harvest scenarios, the harvest quickly becomes unsustainable. Increasing the allowed take level decreased the capacity for the harvest to remain stable or increase...The probability that the population trajectory would be significantly altered increased rapidly with take levels. The better outcome emerged when annual quotas were defined and the hunt was selective" (Lusseau and Lee, 2016). The graphs on the next two pages model the relationship between selective levels of poaching, take levels, and mortality rates. Black dots and sharp increases in exponential graphs show that the population of elephants is in net decline as take levels rise, through all types of selective poaching.

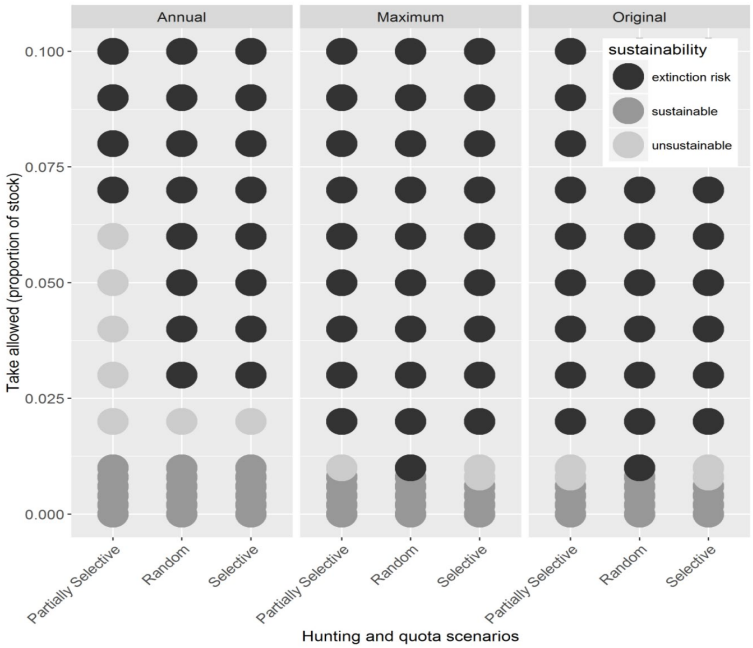


**Figure 2.** This graph demonstrates that harvesting the elephant population for ivory at the shown take levels is unsustainable when combined with random, partially selective, and selective poaching. Populations with an extinction risk are shown in black, sustainable populations are shown in gray, and unsustainable populations are shown in light gray. Lusseau, D., & Lee, P. (2016). Can We Sustainably Harvest Ivory? Current Biology, 26(21), 2951-2956. https://doi.org/10.1016/j.cub.2016.08.060

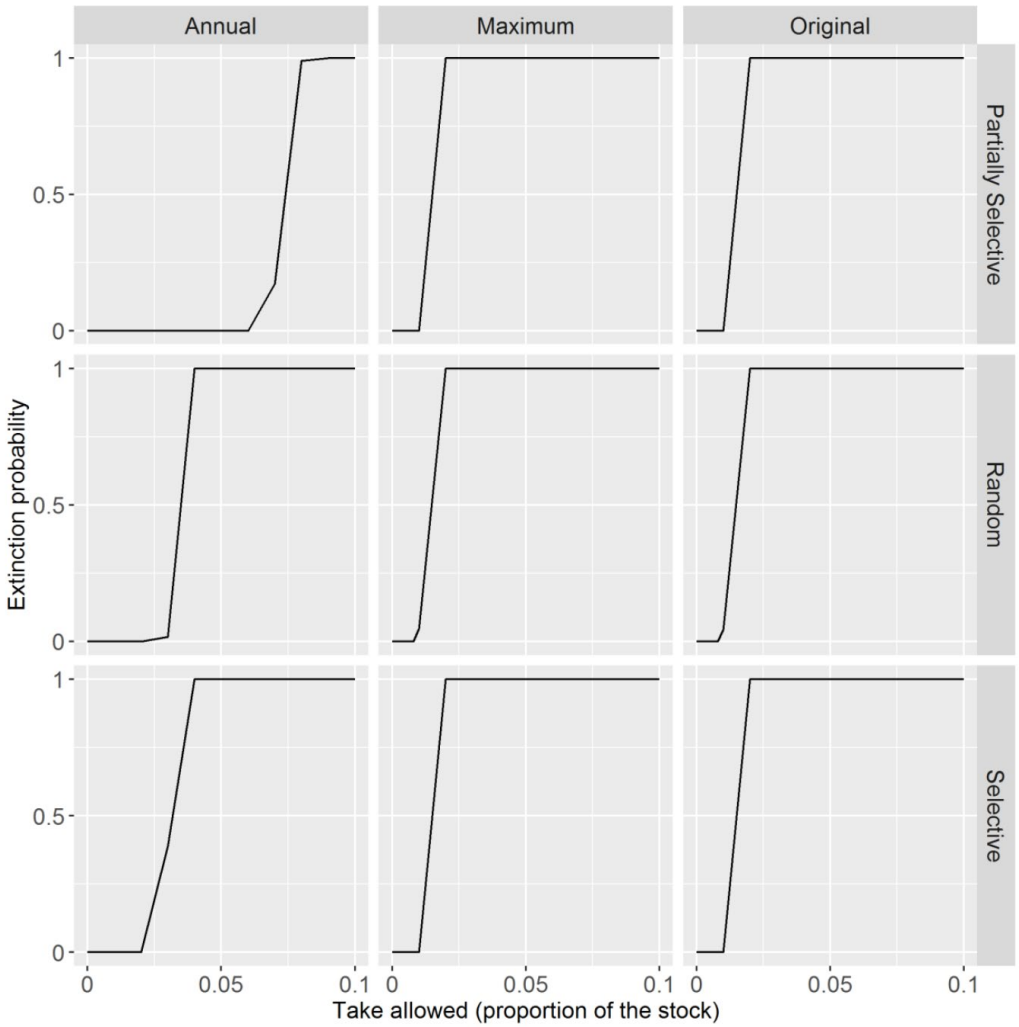


**Figure 3.** These plots demonstrate that harvesting the elephant population for ivory at the shown type of poaching rates and take levels is unsustainable when combined with the probability of extinction. Populations that pass a certain take level see a sharp increase in their mortality rate. Lusseau, D., & Lee, P. (2016). Can We Sustainably Harvest Ivory? *Current Biology*, *26*(21), 2951-2956. https://doi.org/10.1016/j.cub.2016.08.060

## Possibility of A Hybrid Ivory Trade

"With a close eye from CITES and other international groups monitoring Sub-Saharan African governmental actions, this hybrid, legalized trade system could prove to be very effective.
The possibility of ethical sustainable-use ivory trade is very plausible if all parties in the trade work together well and back a zero-tolerance policy for violation of any agreements" (Williams, 2015).

### Gaps in Global Mandates

"In addition to these details about modus operandi, more needs to be known about the conditions that facilitate poaching, including such factors as complicity by local park rangers or officials, support by local populations, [the] inadequacy of resources for enforcement, convenient transportation routes, lack of other means of earning money, etc. Obtaining this information in developing countries that lack trained researchers and administrative and scientific record-keeping systems would be a considerable challenge, but many examples exist (some have been mentioned above) of sophisticated studies of elephants undertaken by those with economic or conservation backgrounds using methods that sometimes differ little from those used in criminology" (Clark and Lemieux, 2009).

### Overall Summary

It has been demonstrated that elephant populations are in a net decline as poaching rates have increased. Governments are heavily corrupted and lie to CITIES governing bodies as the illegal ivory trade benefits their interests. Corruption in government and the wildlife protection sector has let the illegal ivory trade evolve into a global security threat.

## Discussion

### Research Problem and Major Findings

Elephant populations are on the decline as poaching rates have risen. The illicit ivory trade has developed into a global security problem due to corruption in government and the wildlife conservation industry. Failures in regulating illicit ivory trade and implementing prevention mandates, and a shortage of alternatives for developing countries, make it difficult to understand motivating factors.

### Meaning and Significance of Findings

The results of this study agree with previous research in the field. Existing studies corroborate the theory that poaching rates are rising proportionally to the decline in elephant populations. It has made it clear that corruption in government and conservation agencies is a prevalent issue, and must be eliminated to gather unbiased results. These findings confirm the theory that (Williams, 2014) "If conservation were instead focused on a community and nation-based paradigm, it would provide groups with a sense of ownership over elephants, and in turn, a responsibility to conserve the species as well. This community-based conservation approach has already proved to be very effective in post-colonial Namibia, and it has the potential to revolutionize efforts elsewhere in Africa." Centering ivory conservation in the interests of African countries has the potential to create a greater incentive for African governments to cooperate. Communities would have greater motivation to participate in conservation efforts, as they would see the direct effects poaching has on them. Compared to the original thesis statement, this research meets the goals. It analyzes which factors contribute to the African ivory trade in the realms of economics, government, and animal populations. It discusses the effects of these factors, and the causes of these factors. This analysis also considered the effects of CITIES mandates and refocusing them on the interests of African countries, which has proved to be a popular and realistic theory. This

research was able to create a concept of such mandates, and a set of guidelines. However, it was too complicated to create CITIES mandates in detail. Building off these ideas, future researchers could create new CITIES laws.

## Limitations of Study

There were two key limitations to this research due to location and transparency. It is not realistic to travel to Africa to gather empirical evidence, which made secondary research the optimal choice. However, it is hard to root out bias towards a legal/illegal ivory trade or a certain agency/political party when researching such a controversial topic. It can be argued that empirical research would have the same bias issues, but it seems easier to filter opinions out of personal work. Corruption in African governments, wildlife protection agencies, and officials in the wildlife sector made it difficult to find accurate statistical data. MIKE and PIKE values are often left unclear due to governments failing to report correct carcass recovery data. According to Wasser et al. (2010) "Carcass counts, often an important metric of population trends (20), were either not collected or inaccurate in many recent aerial surveys." It is essential to have correct yearly data sets submitted to CITIES to conduct a complete study. Improved replication of this study would involve more comprehensive data regarding governmental involvement per range state. It was not difficult to find statistics regarding animal populations and the economic effect of the ivory trade, but it was difficult to find data in regards to governmental involvement. This can be attributed to the large amounts of corruption in African governments, who are often uncooperative while sharing accurate statistics or following mandates. Ideally, a future researcher would have full access to correct data and would have a greater idea of how to bridge the gap between CITIES mandates and the interests of African countries.

## Alternative Explanations of Findings

Graphs in the form of bar charts could be used to explain these findings. These would be effective when discussing the effect of the illegal ivory trade on animal populations, or the economy. There was a high amount of statistical data collected in these areas, in regards to each study. Each report had a different way of organizing its data, which would make a universal graph difficult to form. There were a great number of external factors that were overlooked. In "Can we sustainably harvest ivory?" by Lusseau and Lee (2016) external factors of weather, famine, and disease were not factored into their experiment. Their elephant population did not survive any of these changes, or any variation in yearly breeding rates. There were also no case studies showing results if predicted take levels or poaching levels changed from norms. The lack of these factors made this experiment unrealistic and caused it to fail. As a whole, it is difficult to find a thorough list of factors for the ivory trade. Clark and Lemieux (2009) argue that "In addition to these details about modus operandi, more needs to be known about the conditions that facilitate poaching, including such factors as complicity by local park rangers or officials, support by local populations, [the] inadequacy of resources for enforcement, convenient transportation routes, lack of other means of earning money, etc." If more was known about these areas, then research would be more complete.

## Social Context of Research

CITIES is the main governing body concerning the illegal ivory trade. It is a worldwide authority with complete control of African governments and has affiliations to the United Nations. They have imposed a total moratorium upon the sale of ivory from 1989, until the present day. This includes stockpiles and carcass ivory. There are conflicts of interests between African countries and CITIES, as African countries see poaching as temporarily beneficial to their economy. The lack of alternatives for poor populations makes poaching a lucrative option, and officials in government can potentially make millions. This research demonstrates that there is a

possibility of the hybrid ivory trade. This means that ivory collected from stockpiles created before the moratorium and newly discovered stockpiles would be sold legally. Ivory collected from dead animals would also be sold legally. Poaching and trafficking of illegal ivory would remain completely banned just as before. This would refocus the interests of CITIES and African countries, and bridge the gap between the two. It would give reason to propose a new set of CITIES mandates that abide by these principles and to give African countries more authority to protect CITIES decisions.

### Impact of Research

These findings fully answered the research question. There was an abundance of information regarding animal populations, the world economy, the economy of specific southern African countries, and governmental corruption. However, there was some disparity regarding motivating factors and covariates. Corruption in the governments of African countries left some questions unanswered, and the full extent of the effect of poverty and Asian markets on the ivory trade is unknown. The overall impact of this study is to conduct an unbiased investigation of how the ivory trade impacts animal populations, economies, and governments in Southern Africa. This research also considers global legislation to combat the current illicit African ivory trade and compares various mandates imposed by governments and conservation agencies such as CITIES. Through such examination, this report aims to propose a concept for new mandates based on general findings, and observe general government influence on the ivory trade in Southern Africa. This report provides an introduction for researchers to the ivory trade and mentions a new idea of a hybrid ivory trade that bridges legal/illegal ivory and the interests of CITIES/African countries. It is ideal for a student who is interested in finding the current state (March 2021) of the ivory trade, without an in-depth exploration. These findings have a strong correlation with international relations, political science, and economics. According to Anderson and Jooste (2014) “This is not just a wildlife poaching problem but part of a global illicit trafficking network that is empowering violent groups and co-opting some elements of Africa’s security sector.” The effects on global and Asian markets can be studied in depth by economics experts, and global security and United Nations activity can be observed by political pundits.

## Conclusion

Through detailed examination, this report proposes a concept for new mandates based on general findings and observes general government influence on the ivory trade in Southern Africa. Findings demonstrate that failures in regulating the illegal ivory trade and enforcing prevention mandates, and a lack of alternatives for poor nations, do not allow motivating drivers to be fully studied.

While a legal ivory trade with controlled breeding and take levels is not possible, a hybrid ivory trade combining existing stockpiles and carcass ivory is possible. As a whole, global mandates need to be more knowledgeable regarding poaching strategies, corruption in the conservation system, and a lack of enforcement and regulation in certain areas. Obtaining this information would prove to be challenging, but it would play a vital role in preventing the sale of illegal ivory. However, governmental corruption makes this process less transparent. A complete and credible data set would allow future researchers to perform more comprehensive research encompassing all factors.

This report serves to provide an introduction to these issues, and a brief overview of the current state of the ivory trade. It exposes conservation advocates and environmental science students to the effects of poaching on animal populations, the economic effects of the illegal ivory trade, and the impact of governmental involvement. It hopes to convey that conservation efforts must be strengthened to ensure the stability of animal populations, which cannot occur when there is corruption in government. A hybrid ivory trade would effectively reduce poaching rates, and reduce motivations for internal corruption.

## Acknowledgments

I would like to thank my advisor for the valuable insight provided to me on this topic.

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