Corruption in the Ivory Trade:
Optimal Ranger Compensation Policies

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Abstract: Despite the 1989 CITES ban on international ivory trade, the poaching industry has continued to thrive, to the extent that African elephant populations are threatened of fric5e1-c 9tin elephant popu

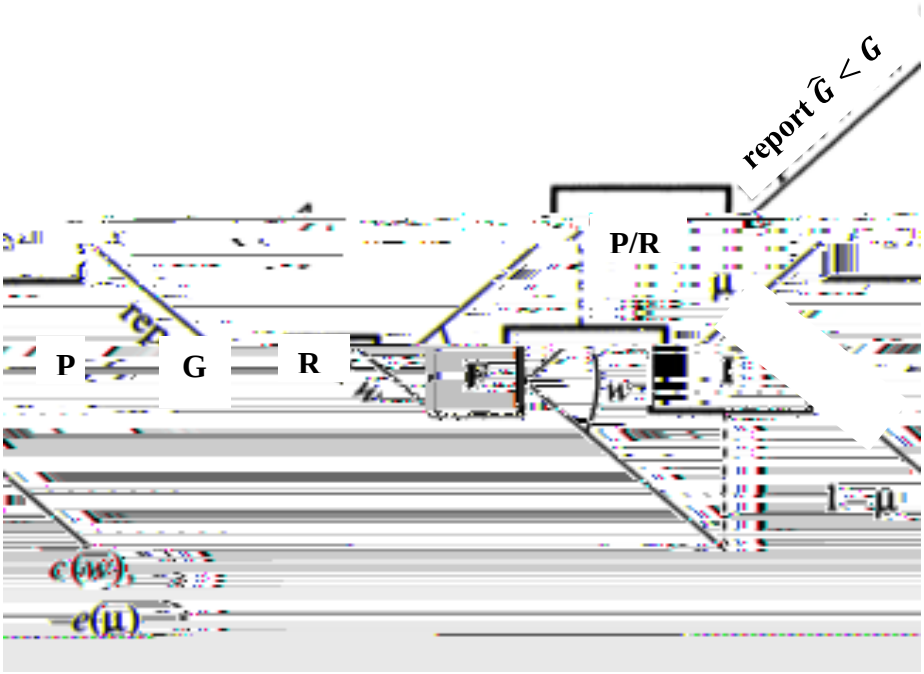
These assumptions are justified as follows:

(1) —— ; The penalty assessed to the poacher increases with the severity of the crime.

(2) —— ; The penalty assessed to the poacher decreases as the size of the bribe increases.

(3) ; The penalty assessed to the poacher will be zero if both the severity of the crime and bribe are zero.

The poacher seeks to maximize his profit and thus faces the classic optimization problem: . This is given by:



Corrupt Interaction

Let us suppose that the poacher has chosen his level of poaching at level *G*, and the ranger has discovered this criminal action. This situation allows us to examine both the conditions under which the poacher and ranger will engage in corruption and the size of the bribe, *B*.

If the poacher does not bribe the ranger, he must pay the penalty equivalent to the fine of for poaching. If he does pay *B* and causes the ranger to decide to report some level , he will pay a reduced fine level . Thus, the poacher expects to gain from the bribe. If the ranger decides to not engage in corruption, he will receive a reward from the government. If the ranger decides to take a bribe *B* and reduce her report of , his reward will be smaller, i.e. . Therefore, his expected gain from accepting a bribe is .

In the event that the ranger has discovered the poacherôs crime, a bribe will only be exchanged if both the poacher and ranger can benefit. Therefore, there exists a necessary and sufficient condition for bribery:

The ranger and poacher are both corruptible, but whether bribery takes place depends on if this condition is met. When it is, meaning that bribery is profitable, we will assume that

poacher and ranger maximize their joint gains and split the amount equally[3]. This means that the ranger and poacherôs respective benefits from bribery are equivalent:

From this, we may find the optimal size of the bribe:

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The above equation shows that when the poacher and ranger act optimally, they decide on a level of to report so that they maximize and balance their joint profits:

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The game decision tree shown in Figure 1 illustrates that the poacher and ranger act independently and simultaneously; no cooperation in decision-making is available, until the opportunity for bribery arises. The poacher decides on her own how much ivory he would prefer to poach, and the ranger determines her level of monitoring effort.

III. Results

Now that we have derived this equation for the optimal size of the bribe, we can examine

Therefore, we find that the two aspects of a rangerôs compensation have opposite correlations with amounts of bribery, and hence opposite correlations with the amount of ivory poached. Increasing a rangerôs salary only serves to decrease the bribe and incentivize the poacher to increase activity. On the other hand, increasing the reward rate for a ranger increases the bribe, making poaching more expensive for the poacher. Based on this theory, we suggest that in order to induce a decrease in poaching incentives, compensation policies should focus on reward rates instead of salaries. These policies, in effect, focus on rewarding rangers for their performance and effort, not their participation[4].

IV. Conclusions

Many efforts have been made to slow the poaching industry for African elephant ivory. However, no policy has made much impact, resulting in a near extinction of the African elephant population. The extremely high value of an elephant tusk on the black market provides great incentives for poachers to harvest ivory. For relatively poor citizens (including the rangers charged with conservation of the species), high-value elephant tusks offer a quick, easy opportunities for wealth. The interaction between poachers and rangers offers an opportunity for corruption where both parties could cooperate and share wealth. As mentioned before, LAGA (2013) has found that corruption does exist, and in at least 85% of conservation enforcement

References

Becker, G. & Stigler, G. (1974). Law enforcement, malfeasance, and compensation of enforcers.