Poachers and Snobs: Demand for Rarity and the Effects of Antipoaching Policies

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Abstract
Habitat loss, climate change, poaching, and illegal wildlife trafficking are threatening a large number of animal populations. Recent research suggests that people place higher value on wildlife or wildlife-derived goods when they are considered rare or uncommon. Although supply-side antipoaching policies—such as strengthening the enforcement of regulations against illegal hunting—decrease people’s incentives to engage in poaching, one significant consequence of the demand for rarity is that it weakens the impact of these policies. While the demand for rarity cannot completely offset the effects of supply-side antipoaching policies, the reduction in the amount of poaching that can be achieved using these policies may not be large when people are willing to pay more for rare wildlife goods. This calls into question whether actions targeting the supply side of the market for poaching are the most effective ones for protecting endangered or threatened species affected by poaching.

Introduction
Habitat loss, climate change, and overexploitation are threatening a large number of animal populations and driving the dramatic loss of biodiversity around the world (Dirzo et al. 2014). In addition, poaching and illegal trading of wildlife are further contributing to the decline of many threatened or endangered species. To compound matters, growing demand for wildlife-derived products such as ivory and rhino horns in Asia has fueled a rise in poaching (Biggs et al. 2013; Wittemyer et al. 2014), thus exacerbating the population pressures on elephants, rhinoceroses, and other wildlife that yield commercially valuable goods that can be bought and sold.

In response to the high levels of poaching and the dwindling populations of numerous protected species, many conservationists and policy makers have—not surprisingly—proposed strengthening antipoaching regulations and their enforcement, and increasing investment in the monitoring of illegal hunting and trading of wildlife (Ivory and Insecurity: The Global 2012; Cressey 2013; Executive Order No. 13648 2013). There are also those who argue that providing local communities who live in close proximity to high-value species incentives to conserve by, for instance, giving people more secure rights over their land and resources or paying them for conservation practices would encourage these communities to protect wildlife rather than engage in poaching to support their livelihood (Challender & MacMillan 2014).

Although these two approaches for combating the rise in poaching of protected species and illegal wildlife trafficking—stepping up regulations and monitoring, incentivizing local communities to conserve—may differ in terms of where resources should be prioritized—for example, under the first approach, more resources would go to law enforcement agencies such as park rangers; under the second proposal, resources would be allocated to local communities—they are similar in that they both affect the incentive to poach wildlife and thus operate on the supply side of the market for wildlife goods. In economic terms, stronger antipoaching laws and their
enforcement increase the cost of poaching, which—all else equal—reduces the supply of poaching. On the other hand, incentivizing local communities to conserve wildlife decreases the benefit of poaching relative to its alternatives, which—all else being equal—also reduces the supply of poaching.

Since both approaches serve to reduce the incentive to poach, it seems logical to conclude that either one would be effective in decreasing the amount of poaching. Whether this conclusion is correct or not, however, ultimately depends on the interactions of all the forces in play in the market for wildlife goods, including those on the demand side.

**Bandwagons and snobs**

At least as far back as the late 19th century, economists have noted that people’s demand for a good can depend on how many other people are consuming that same good (Veblen 1899). For certain products, some people’s valuation of them increases the more popular these goods are; this is known as the bandwagon effect (Leibenstein 1950). On the other hand, there are goods for which people’s liking depends inversely on how many other people own them—i.e., for these goods, the rarer they are, the more people value them; economists call this the snob effect (Leibenstein 1950).

Recent research suggests that people may place higher value on wildlife or wildlife-derived goods when they are considered rare or uncommon (Gault et al. 2008; Angulo et al. 2009; Johnson et al. 2010; Lyons & Natusch 2013). Hence, the demand for many wildlife goods may be subject to the snob effect—the less common these goods are, the more people want them and the more people are willing to pay to obtain them. One significant consequence of this is that this effect ultimately weakens any supply-side antipoaching policies. While the demand for rarity cannot completely offset the effects of supply-side antipoaching policies, the reduction in the amount of poaching that can be achieved using these policies may not be large when people are willing to pay more for rare wildlife goods. This calls into question whether actions directly targeting the supply side of the market for poaching—such as the two approaches described previously—would be the most effective ones for protecting many endangered or threatened species affected by poaching and illegal trading.

**The market for poaching: an economic analysis**

In order to understand how the snob effect would work in the market for poaching, let us first consider the effects of supply-side antipoaching policies when the snob effect is absent.

**The market without the snob effect**

Assuming that the market for wildlife goods is fairly competitive, we can use the supply-and-demand model from economics to illustrate how the amount of poaching is determined in this market (Figure 1). The demand curve tells us how the amount of wildlife goods people want to buy changes as their price changes, all else being fixed. Similarly, the supply curve shows how the amount of goods poachers want to sell changes when the price is varied, everything else being equal. The market is in equilibrium when the price of wildlife goods equates what the sellers want to supply to the amount consumers want to buy; this gives us the amount of poaching in the market.

Now, suppose more stringent antipoaching regulations are implemented or governments decide to invest more heavily in the enforcement of these regulations. These actions increase the cost of engaging in poaching so that at any given price of wildlife goods, there is less supply in the marketplace. In terms of our supply and demand curves, these policies shift the supply curve of wildlife goods to the left, thus resulting in a new market equilibrium with less poaching (Figure 2). Note that in the new equilibrium, the price of wildlife goods is higher because these antipoaching measures restrict supply, and—in a market without any price controls—the price has to rise to bring down demand to the lower level of supply.

The same conclusion is obtained if, instead of implementing policies that raise the cost of poaching, local communities that live close to wildlife are compensated for conservation practices. Giving people in these communities more incentive to conserve wildlife makes poaching less attractive, which also shifts the supply curve of wildlife goods inward. Similarly, policies that raise the standard of living in these communities, or provide local people with better and more employment opportunities so that they would be less inclined to poach endangered wildlife to make ends meet, would move the supply curve of wildlife-derived goods to the left, thus reducing the amount of poaching.

**The market with the snob effect**

The analysis is not as straightforward, however, when people’s preferences for wildlife-derived goods exhibit the snob effect. First, let us see how we can depict the snob effect graphically. Suppose people’s liking of a wildlife good, given some level of popularity of it, is represented by the market demand curve $D_1$ in Figure 3. If people’s valuation of the good does not depend on its popularity or how many people own it—i.e., if there is no bandwagon or snob effect—then changing the good’s popularity will not affect its demand curve.
Demand for rarity and antipoaching policies

The market for wildlife goods is in equilibrium when the price of goods equates the amount sellers want to sell to the amount consumers want to buy. The equilibrium quantity of wildlife goods, \( Q^* \), reflects the level of poaching.

Figure 2: Policies that increase the cost of poaching or the benefit of conserving wildlife shift the supply curve of wildlife goods inward from \( S_1 \) to \( S_2 \), which reduces the equilibrium level of poaching from \( Q_1 \) to \( Q_2 \). The equilibrium price of wildlife goods rises from \( P_1 \) to \( P_2 \).

However, if buyers are willing to pay more for the good when fewer people own it (the snob effect), then its market demand curve will shift up (to \( D_2 \) in Figure 3, for example) when the good is less common (Leibenstein 1950).

Now, suppose some policy—for example, more stringent enforcement of antipoaching regulations—is implemented that shifts the supply curve of wildlife-derived goods inward. As we saw above, without the snob effect, this shift of the supply curve would be the end of the story—there would be less poaching in the new equilibrium of the market. When the snob effect is present, however, the story does not end there. Notice that because of the policy implementation, fewer wildlife goods would be sold in the market (as seen in Figure 2, \( Q_2 \) after the policy compared to \( Q_1 \) before the policy), which means that these goods would be less common. But if consumers’ desire for these goods becomes stronger once the policy in question has reduced the amount of poaching and hence made these wildlife goods scarcer, the demand curve would shift outward (from \( D_1 \) to \( D_2 \) in Figure 3). This would result in a new market equilibrium in which the price of the goods is even higher. Moreover, consumers’ higher willingness to pay for the wildlife goods would induce suppliers to bring more of the goods to the market; thus, the reduction in poaching that
Demand for rarity and antipoaching policies

F. Chen

Figure 3 Without the snob effect, an antipoaching policy that shifts the supply curve of a wildlife good from $S_1$ to $S_2$ will reduce the equilibrium amount of the good to $Q_2$. With the snob effect, however, the antipoaching policy and the resulting reduction in the availability of the good will shift the demand curve out, leading to an equilibrium in which the amount of the good sold is $Q_3$.

would be brought about by a supply-side policy would be partially offset by the snob effect.

Just how much of the effect on poaching of a supply-side policy would be negated by the snob effect depends on consumers’ preferences, specifically on how much people’s valuation of wildlife goods depends on their popularity or scarcity (see Supplementary Material for a mathematical treatment of this issue; how the impact of a supply-side policy depends on the elasticities of the supply and demand curves is also shown in Supplementary Material). In particular, if the snob effect is strong or if many people’s preferences for wildlife goods are subject to this effect, then the impact of a supply-side antipoaching policy would be significantly reduced by it (see Figure 3 for an illustration).

Is it possible for the snob effect to be so strong—and move the demand curve out so much in response to a supply-side policy—that the market ends up in a new equilibrium in which there is more poaching than the outcome we have before the policy is implemented? In other words, can implementing a supply-side antipoaching policy, through the snob effect, lead to a perverse outcome in which the level of poaching and wildlife trafficking actually rises instead? In short, the answer is no. If the demand curve shifted out so much that more wildlife goods were bought and sold in the market compared to the situation before the policy implementation, people’s valuation of them would decline—the more popular the goods become, the less people would be willing to pay for them. The market would adjust until it reaches a point where there are fewer wildlife goods sold compared to the prepolicy situation. In other words, no matter how strong or pervasive the snob effect is, the supply-and-demand model tells us that supply-side antipoaching policies would reduce the amount of poaching (see Supplementary Material for a mathematical proof). But when the snob effect is operating, this reduction may not be very large.

Conclusion

To protect animal populations threatened by poaching and illegal trading, there are fundamentally two approaches that we can take: implementing policies that affect the supply side of the market for wildlife goods, or taking actions that impact the demand side of the market. While conservationists and policy makers have long advocated for supply-side interventions and recognize that curbing demand for wildlife goods is vital for combatting the growth in poaching and wildlife trafficking, little attention has been focused on how the outcome in the market for wildlife goods can depend on the interplay between forces on both the demand and supply sides of the market.

As economists have long known, social factors such as the popularity of a good can affect—positively or negatively—the value that consumers place on it. In the wildlife context, studies have shown that people are willing to pay more for a good when it is rarer. It has been hypothesized that this preference for rarity, by giving people even more incentive to exploit rare species—thereby making them even more desirable—could give rise to a self-reinforcing feedback loop that makes extinction far more likely—an effect dubbed the anthropogenic
Demand for rarity and antipoaching policies

F. Chen

Allee effect (Courchamp et al. 2006). In this article, we have shown another consequence of the demand for rarity: when people's liking of wildlife goods is influenced by how exotic—i.e., how uncommon—they are, the impact of supply-side antipoaching policies could be greatly diminished.

Beyond explicating the efficacy of supply-side antipoaching measures when snob effects are present, this article makes clear that in order to more accurately analyze and assess the effectiveness of conservation policies, it is critical that we account for factors on both sides of the market for wildlife goods and how they interact with one another. The tools and theories of economists allow us to do that, and the field of economics gives us an analytical framework with which to examine conservation issues with a broader scope.

The rapidly growing economies in Asia have been a major driver of elephant poaching and the illicit ivory trade (UNEP, CITES, IUCN, TRAFFIC 2013). Continued growth in the Asian countries will, in the absence of any intervention or changes, surely lead to greater demand for wildlife goods in the near future. This force alone could totally negate the effects of supply-side antipoaching policies. Even if we assume optimistically that rising income levels in Asia will not raise demand for wildlife goods any further in the future, the snob effect alone—as we have seen here—can almost fully offset the impact of a supply-side policy. These two observations—the rapid economic growth in Asia, and the existence of the snob effect—should spur us to evaluate the true cost-effectiveness of supply-side antipoaching measures and to think harder about how to deal with demand-side factors in the market for wildlife goods.

Conservationists and policy makers, when proposing solutions to the poaching and illicit wildlife trafficking problem, tend to advocate a two-pronged approach that consists of supply-side policies on the one side and recommendations to reduce consumer demand on the other side (Ivory and Insecurity: The Global 2012; Executive Order No. 13648, 2013). Such proposals, however, rarely, if ever, touch on the cost or the effectiveness of the recommended measures. If we care about allocating our scare resources efficiently, then our discussion above implies that our money, time, effort, and resources may be better invested in finding ways to curb consumer demand for wildlife goods, rather than in supply-side policies that can be diluted or negated by demand-side factors.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher’s web site:

Poachers and Snobs: Demand for Rarity and the Effects of Antipoaching Policies (Supplementary Material)

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