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Legal, Moral and Biological Implications of Poaching and Illegal Animal Trafficking on an International Scale

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Poaching: A Widespread Issue

Poaching is a lucrative and international illegal business. According to some statistics, poaching is nearly a 20 million dollar trade, coming in third in profits after the illegal drug and arms trades. One of the most popular areas for poaching is the rainforest found in Brazil and Latin America, where some of the most varied and colorful fauna are found. (Giovanni, 2006) Other popular areas for poaching include China, India and Africa. Many of the animals that are captured to be sold later are either sold in open air markets such as Chatuchak in Thailand and others in China or are exported to other countries. (CNN) The majority of animals sold through illegal trafficking are bought by buyers in the United States, followed by Japan, Europe and the Middle East. (Dermota, 1995) They are often bought by rich collectors who enjoy "exotic pets". According to Dermota's research, a certain type of macaw can be sold in the United States for up to $10,000, while a certain monkey sells in Japan for over $50,000. With profits such as these, it is no surprise that many people have turned to the illegal animal market to make money.

Certainly animal trafficking is a cruel prospect, even if one does not account for the animals that are killed just for their parts. Animals react poorly when being transported even under the best of circumstances. In a study by Hart et al in 2008 comparing the behavior and physical condition of a group of recently translocated African elephants to a group native to the area, it was found that the translocated elephants had an overall lower condition. As seen in Figure 1., the translocated elephants had a lower body condition than their native counterparts throughout all seasons that the study was

performed. The body condition of the native elephants ranged from approximately 1.4 to 1.8 on a body scale ranging from 0 (poor) to 2 (good). The condition of the translocated elephants ranged from approximately 1.25 to 1.5. All seasons showed a lower value for the translocated elephants as compared to their native counterparts. They also had a higher mortality rate. (Hart et al, 2008) If these animals fared poorly under conditions that were optimized for their travel, it is no surprise that animals did not fare well under the poor conditions that are provided for them by poachers. Charles Bergman, a researcher who personally traveled to research the poaching issue, describes the conditions that these creatures travel under in their article, saying "They are smuggled in thermoses and nylon stockings, stuffed into toilet paper tubes, hair curlers and hubcaps." (Bergman, 2009) With such disregard for the basic needs and comforts of the animal, it can be said that poaching is a cruel and unusual punishment for any animal that has to endure it. Not only that, but most animals either die or become sickly in transit. And the worst is yet to come. The rise of poaching as a global industry is not only a threat to individual animals, but to entire species.

The Threat of Extinction

One of the species most threatened by the actions of poachers and traffickers is the tiger. Tigers are an immensely popular victim for poachers for several reasons. Tiger parts and pelts are very popular and lucrative items on the black market. Used in both traditional Chinese medicine and sometimes even in food, tiger parts are in high demand. (CNN, 2007) Efforts have been made by the Chinese to lessen this illegal tiger poaching, such as the banning of trade of tiger bones in 1993, the attempted establishment of legal, captive bred tiger farms and the establishment of protected environments. (Bennett, 2007) However, poaching is far more valuable to the poachers and far more difficult to prevent. It poses a severe threat to the entire species. Chapron et al use comparative multi-type branching process models and deterministic models to examine the effects of heightened mortality rates

on tiger populations and reveal that the combination of high rates of poaching and the low rates of reproduction in tigers may result in the tiger populations being unable to replace their poached members at an acceptable rate. Because of this, they claim that "Reduction of human-caused mortality is the most essential short-term conservation effort that must be made." (Chapron et al, 2008) Goodrich et al also examined the causes and survival rates for Amur tigers in the area of Sikhote-Alin Biosphere Zapovednik. Figure 2., which describes the cause of death for 53 tigers over a period from 1976 to 2001, shows that poaching was the greatest cause of death for tigers, responsible for 34% of all deaths. The researchers also express concern for the relationship between tiger cub mortality and poaching, usually due to the mother being poached. In their conclusion, they declare the high rates of poaching to be unsustainable by the Amur tiger population. (Goodrich et al, 2008) The loss of the tiger would be a blow to the entire world. It is not only a beautiful and iconic species, but it is a major player in the environment and a keystone predator that cannot be lost.

Another animal that is facing endangerment as a result of poachers is the elephants. Elephants are targeted by poachers due to the valuable ivory that is in their tusks. It is a valuable business and still growing, with prices of ivory quadrupling from $200/kg in 2004 to $850/kg in 2006. (Clark et al, 2008) In a study done by Arctander et al, they reveal that a period of poaching occurring in the 1970s to the 1980s caused immense decreases in population. Their estimates state that over 80% of the population was removed through poaching in less than a decade. If another major poaching even such as this occurred, it could wipe out elephant populations for good. (Arctander et al, 2008) A study done by Gobush et al also proves that poaching endangers elephant populations in other ways. Female elephants in areas that are frequented by poachers show lower reproduction rates than those in relatively unaffected area. The stress and interruption in social relationship that occurs when older matriarchal elephants and others are removed from their group lowers reproductive output. As seen in Figure 3., the

percentage of nonreproductive elephants in a disrupted group is approximately 30% higher than in intact groups and the number of elephants with a baby is approximately 25% lower. In a species that have fewer offspring over longer periods of time, this decrease in reproduction could cause an unrecoverable decrease in the population.

Many more species are endangered by the actions of poachers as well. A survey done of the endangered grey snub-nosed monkey (*Rhinopithecus brelichi*) by Chang et al (2009) in Guizhou, China showed that one of the main threats to the population is accidental injury or death by poachers seeking other species. Based on these results, the researchers suggest that the administration bureau of the area should make an effort to control poachers by increasing law enforcement patrols in the area. In a study of the endangered Scandinavian wolverine (*Gulo gulo*) by Ericsson et al (2009), the most important cause of mortality was poaching, which consisted of 36% of deaths witnessed in the study group. As shown in Table 1., there were a total of 9 deaths from poaching out of a total of 40 known deaths altogether (this is not counting wolverines who were lost and whose deaths cannot be accounted for). As such, the researchers state that poaching is a significant threat to this already endangered population. In a study of the effects of poaching on marine life using an age-structured reserve model Hilborn and Sethi (2008) find that legal fisheries will have to decrease their harvest from their normal stock if poaching continues, in order to preserve the marine life that is left in the area at harvestable levels. In this scenario, both the legal businesses that rely on the ocean and the marine life suffer from poaching. Another study, of the reem gazelle of Oman by Al-Lamki et al (2008) reveals that evidence of poaching events were one of the main causes of the gazelle's population decline. Leatherback turtles (*Dermochelys coriacea*) also suffer from poaching, this time of their eggs. As shown by Figure 4., the turtles show a much greater decline in population with the rate of 90% poaching that was estimated for Las Baulas Marine National Park than with the normal 20% mortality rate. As such, the turtle

population will continue to decrease exponentially unless efforts are made against egg poachers. (Paladino et al, 2008) Dear et al (2009) also did a study examining the nesting sites of the scarlet macaw (*Ara macao*) in the Osa Peninsula Conservation area. Although it was not their intention to discover evidence of poaching, they found that 11 out of 57 sites they studied showed evidence of poaching, and it was probable that there were more that they had not seen. This is just a small fraction of the species that are threatened with extinction by poachers. Even as important as the decline of these species is, there is an even greater issue at stake with the decline and possible extinction of these species.

Ecosystem Impact

As mentioned before, poaching is one of the greatest threats to many species and could eventually result in the extinction of such species if left unchecked. Certainly the extinction of any one species is a loss on its own. However, it is important to realize that the extinction of just one species does not just impact that one animal, but has a larger range of effect. Removing only a single species can have a major impact.

Take, for example, the simplified predator and prey interaction described by Anthony Ives. In this article, Ives describes the population dynamics that occur between species with a predator and prey relationship. As seen in Figure 5., the lynx (a predator) and the snowshoe hare (the prey) undergo a cycle of population increase and decrease. As the population of the snowshoe hare rises, the population of the lynx begins to rise soon afterwards. This brings the overall population of the hare down to much lower levels, which eventually results in the decrease of the lynx population as well. This is a normal dynamic that occurs between a predator and prey species. (Ives, 2009) However, consider what would happen if the lynx were to be removed from the equation. Because the increase in the lynx population is responsible for the decrease in the hare population, the lynx acts as a limiter for that population. The model proposed by Hastings et al in their 2007 study also confirms that predators can act as a limiter for

a prey population, preventing large fluctuations in prey density that might result without predator stress and killings. (Hastings et al, 2007) If the lynx in the above system were removed, the hare population would be allowed to grow unchecked and resulting positive population fluctuation of hares would put severe strain on the ecosystem, causing the resources that the hares could use to diminish rapidly. If other species were dependent on these resources, then the hares would endanger both their own species by overconsumption as well as others. Of course, Ives' model is oversimplified, as it contains only one predator and one prey. In a true ecosystem, there are usually multiple predator and prey animals that interact. However, it does show that the disruption of a dynamic can have severe effects on the surrounding environment.

One of the most famous experiments that illustrates the effects of one species on the dynamics of an ecosystem is the reintroduction of wolves to Yellowstone National Park. The wolves, since their reintroduction, have had a positive impact on the overall ecosystem of the park. One species that has flourished since the reintroduction of wolves to the park is the aspen (*Populus tremuloides*). The reproduction of this species is directly effected by elk, whose browsing prevents the aspen fro reproducing properly. In a study by Ripple and Larson, it was found that the newly reintroduced wolves would have a positive effect on the aspen population by affecting the elk. By acting as a predator towards the elk, the elk population is reduced and their browsing habits are altered, thus protecting the aspen trees and allowing them to flourish. (Larson et al, 2000) Other species have also been influenced positively by the wolves' reintroduction, including willows and scavengers such as insects. (CNN) Because the wolf is a keystone predator, one that affects all species by being present, its reintroduction had such a positive effect on the system. As such, it could also be said that the absence of the wolf had a negative effect on the ecosystem. The success of this reintroduction experiment proves how vital just one species can be to an entire ecosystem and how dangerous the removal of a species through

extinction can be. Unbalancing an ecosystem so that other species engage in the overconsumption of resources or decline from lack of resources is a serious result of extinction, which is a real threat from poaching.

The Moral and Philosophical Issue of Poaching and Animal Rights

Certainly poaching and the illegal trafficking of animals have a great impact on the environment. However, the issue of animal rights as a moral and philosophical issue must also be considered. As responsible citizens, humans must come to define the place of animals in their society before they can begin to protect them. The role of nature and non human in civilization has been discussed throughout history and it has been determined that animals do have their own role in the realm of human morality and judgment.

The idea of humans and animals coexisting in a peaceful manner has been considered since the days of the Greek Empire. In Plato's "The Republic", Socrates discusses the creation of a healthy city in which all men live in a just and noble manner. By his definition, a healthy city is one that does not produce excess and is therefore free of greed, immorality and excess desire. In this idealized city, the human population is expected to live in harmony with nature, bringing no unnecessary harm to it. In one part of the book, Socrates discusses the eating habits of this healthy city. "For food they will prepare barley meal and wheat flower; they will cook it and knead it. Setting out noble loaves of barley and wheat on some reeds or clean leaves, they will stretch out on rushes strewn with yew and myrtle and feast themselves and their children." (372b-c Plato) This simple feast suggests that no animal will even be harmed for food purposes. Later in the book, when he describes an unhealthy city, he revisits this point, saying that there was no need for animal slaughter in the ideal city. Therefore, because the healthy city was the just and noble one, the act of harming animals and nature would be an unjust and ignoble one.

A more modern author who addresses the issue of animal rights is Martha Nussbaum, who uses her book *Frontiers of Justice* to establish a set of principles applying to all sentient creatures. In particular, she states that all sentient beings have a right to the "opportunities for a flourishing life" (384). The first of her principles is that all animals have a right to life, that continues until sickness or old age make death no longer a harmful option. This right may be waived if the killing of an animal occurs for a good reason, such as for needed sustenance or in order to protect the lives of others. The second principle that Nussbaum proposes is the right of all creatures to a healthy life. The next entitlement for animals is the right to senses, imagination and thought, which includes the ability to move freely and have pleasure. The final right addressed is the right to emotion, where animals are "entitled to lives in which it is open for them to have attachments to others, to love and care for others, and to not have those attachments warped by enforced isolation or deliberate infliction of fear." (Nussbaum, 397) These are all simple, basic and reasonable rights for any creature. Most humans would argue that these rights to freedom and happiness should be unalienable to any person, so why should we not also extend them to other sentient beings? After all, animals have proven that they, too can be almost human-like in nature, "capable of intelligence and planning, capable of emotion and responsiveness, capable of awareness of another animal's feelings…capable of joy, humor and delight." (Nussbaum, 2001) All sentient animals are capable of suffering, and preventing this suffering could be done by simply following Nussbaum's rules and making them law. At the end of her book, Nussbaum calls upon the governments of the world to protect these basic rights for all sentient beings.

Religion also addresses the treatment of animals. Because religion is such an important aspect of human life and a major guide for determining morality, it is important to look at the views that religion creates regarding animals' condition and welfare. Christianity is one such religion that addresses the

role of animals in a world of human rule. In particular, Genesis of the Bible brings up the role of animals in human society. In Genesis 1:28 through 1:30, God states,

> "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth." And God said, "Behold, I have given you every plant yielding seed which is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food. And to every beast of the earth, and to every bird of the air, and to everything that creeps on the earth, everything that has the breath of life, I have given every green plant for food." And it was so. And God saw everything that he had made, and behold, it was very good.

In this passage, God gives the responsibility of caring for all living things to humans by giving them "dominion" or leadership over all living creatures of the earth. God also provides humans a means of sustenance, plants, which does not involve the harming or killing of animals in any way. Gold also provides the same means of sustenance for the animals and goes explicitly out of the way in order to state that the plants will provide food for all living creatures. Thus, this entire passage suggests that humans were given a responsibility by God to watch over the animal kingdom without causing them harm.

The Catechism of the Catholic Church also directly addresses the treatment of animals. Paragraphs 2415 through 2418 acknowledge the idea of "Respect for the integrity of creation". In particular, it states that "*Animals* are God's creatures. He surrounds them with his providential care. By their mere existence they bless him and give him glory. Thus men owe them kindness." (2416) It also states that "contrary to human dignity to cause animals to suffer or die needlessly." (2418) Therefore, it is mankind's duty as children of God to prevent the suffering of animals through acts such as poaching and trafficking in order to preserve God's creation.

Other religions also address the treatment of animals as a moral issue. In the Islamic faith, there are several animal related hadith on Muslim ethics and manners by in *Al Adab Al Mufrad* by Bukhari, a Muslim scholar best known for his publication of *Sahih Bukhari* (considered to be one of the most

authoritative books of the religion). One such story, 378, had a man who climbed back down in to a well after drinking from it in order to provide water to a thirsty dog nearby. The Messenger of Allah then states that "There is a reward on account of every living thing." (Sunni Path) Therefore, giving mercy and good treatment to animals is a part of the Islamic faith. The Jewish faith also includes several provisions for the care and rights of animals. Under Jewish laws, animals are given the right to rest on Shabbat (Exodus 20:10), oxen are not allowed to be harnessed so that they cannot eat while in the fields (Deuteronomy 25:4), animals are required to be relieved of burden regardless of ownership (Exodus 23:5, Deuteronomy 22:4), one is not allowed to take the eggs from a nest unless the mother bird is no longer present (Exodus 20:12) and one is not allowed to purchase an animal unless they are able to properly feed it (Deuteronomy 11:15). All of these laws are meant to prevent the needless suffering of animals. Because religion is such an important source of morality, one that people look to in order to guide their actions, it is important to note the rules that religion provides in order to protect animals. The rights of animals are an important enough issue to be addressed in the world's three major religions, showing that it is an issue significant enough to relate to all people.

Poaching and animal trafficking are in contrast to all of these views of nature. Certainly, the violent trapping and killing of animals does not fit into the idea of coexisting with nature that is proposed by Plato in his "Republic". The actions committed by poachers and traffickers also deny every single basic right proposed by Nussbaum. If the animals are not killed outright for parts, they are transported and stored in small and unsanitary cages and containers, depriving them of health, movement and freedom from fear. These actions certainly go against the religious considerations of animal welfare. While God did give humans "dominion" over the animals, God also charges mankind to watch over the earth and provides humanity with a means to sustain itself outside of the harm of animals. There are direct provisions in the Catechism of the Catholic Church that tell people to prevent

the suffering of animals as part of God's creation. The harm caused to animals by poaching and trafficking also is in direct conflict with the Islamic and Jewish views on the care of animals. Islamic religion states that people will be rewarded for giving compassion and mercy to animals, suggesting that the cruel actions of poachers would be punished. Judaism specifically creates laws to prevent the unnecessary suffering of animals. Therefore, poaching and trafficking are in direct conflict with multiple moral codes, both religious and nonreligious, and can be considered to be an important issue for mankind to consider as responsible world citizens.

Efforts Against Poaching

One organization that is helping prevent poaching and animal trafficking is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It is an international effort to prevent the trade of wildlife from endangering the species involved. CITES is legally binding, though voluntary, to all parties (countries) involved and acts as a framework for these countries to create their own legislation. CITES legislation primarily consists of lists of endangered and threatened species for which certain trade regulations are created. These species are listed in three appendices. Appendix I covers species that are threatened by extinction with regulation that trade of these species is only allowed to occur under extraordinary circumstances. Appendix II includes species that may not be in danger of extinction, but need protection and highly controlled trade in order to ensure their survival. Appendix III includes species protected in at least one country in which the members of that country have asked other members of CITES to aid in the protection of that species. These protections to animals and trade rules apply to all countries who have become members of CITES. Currently there are 175 different countries who are members of CITES, including the United States, the United Kingdom and, several countries in Africa, Asia, and South America, among others. (CITES website)

There is also the Coalition Against Wildlife Trafficking (CAWT), an international organization that is dedicated to "focus public and political attention and resources on ending the illegal trade in wildlife and wildlife products". (CAWT website) Their mission is to help and enhance the current efforts to aid in protecting endangered and threatened species by monitoring and regulating the international trade and market. In particular, they aid CITES in implementing their policies, help to reinforce communication among members of the Coalition, and spread the word of their activities to other nations. Currently the countries with governments who are members of the Coalition Against Wildlife Trafficking include the United States, Australia, Canada, Chile, India, and the United Kingdom. They work alongside several other organizations including the World Wildlife Foundation and the Smithsonian.

Australia, with its highly unique flora and fauna, is a growing target for poachers and traffickers. In just a short time, seizures made in illegal wildlife trade jumped from "3902 in 2004–2005" to "7533 seizures in 2006–2007". (Georges, 2008) As seen in Figure 6., the most common punishment for poaching in Australia is a fine, which has been mandated in 70% of case prosecutions between 1994 and 2007. Other punishments are part of a Good Behavior Bond (GBB) where defendants are released under a set of provisions that they must follow or face imprisonment and heavy fines. In general, these punishments are less severe than those meted out in countries such as the United States and United Kingdom. In order to further combat the poaching threat, Australia established the Australian Wildlife Forensic Network (AWFN) which is meant to provide education and evidence for crimes of poaching. They are also investigating further policies that can be implemented in order to combat illegal animal trade. (Georges, 2008)

While these organizations do provide guidelines for the creation of protective legislation and provide laws for animal trading that countries are required to follow, there is the problem of enforcing

these laws. There is a definite need for patrols of affected areas, even a study by Hayward (2009) about bushmeat hunting states that attempting to erect barriers around areas afflicted by illegal poaching will be ineffective without human supervision. However, as shown in documentaries such as the "Planet in Peril" series shown on CNN in 2007, much of the illegal trading of animals occurs in open air market places with little supervision, communication systems between the illegal traders and complicated setup which causes great difficulty for officers of the law to actually reach the illegal shops in question. Therefore, while laws are in place in order to protect the rights of animals, there needs to be a greater effort to aid those who attempt to enforce them. One of the tools that could potentially be used to aid law enforcement is DNA Forensics. A study by Clark et al. (2008) showed the illegal ivory market that threatens elephants can be tracked using forensic information. DNA evidence can be used to discover which crimes are linked, where the products are being shipped and who is receiving them, thus allowing authorities to find out the depth and breadth of poaching syndicates responsible for the illegal ivory trade. (Clark et al. 2008) Another important tool for law enforcement can be cooperation with local populations. One such program has been implemented in Pennsylvania. The "Turn in a Poacher" Program has been moderately successful in protecting the Steelhead salmon population in the area from illegal poachers, allowing concerned anglers and citizens to report any poaching incidents. They are still looking for even more effective methods to deal with the poaching issue, though. (Berg et al, 2006) Undercover operations, such as "Operation Shellshock" which documented over 2400 turtles, snakes and salamanders involved in illegal trafficking, also allowed for the arrest of individuals involved in this illegal business. (New York State Conservationist, 2009) Another tool that might help enforce the protection of species is tourism. A model by Cornelius van Kooten (2008) shows that countries interested in preserving their endangered species for viewing by tourists will have lower chances of

being endangered. However, even with these different efforts, poaching is a large and lucrative business that needs to be combated on an even wider scale.

Figure 1.

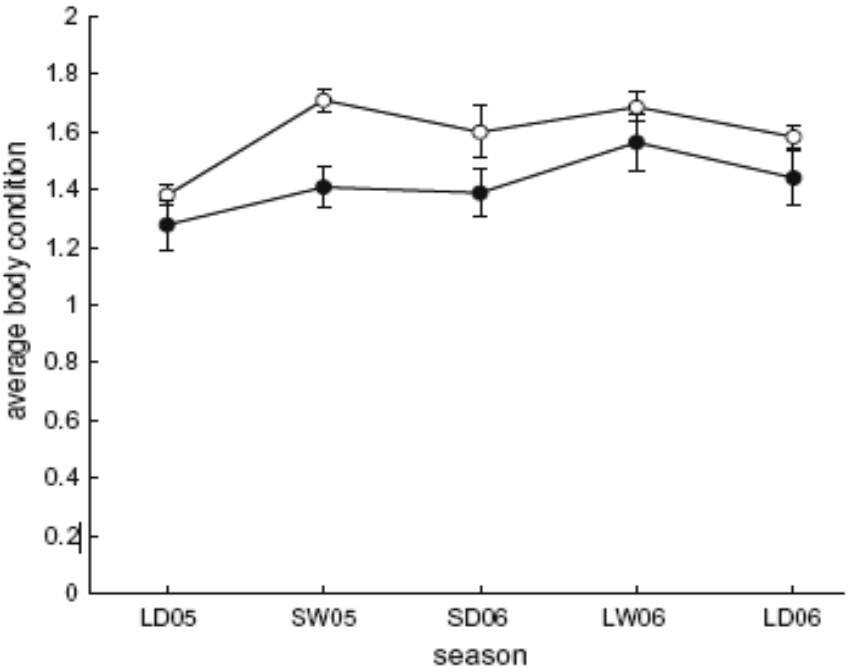

Fig. 1. Translocated and resident elephants' body condition over time: Average (+/- SE) body condition of adult translocated elephants (black circles) and local Tsavo elephants (white circles) throughout the study period, by season. Body condition ranges from 0 (poor) to 2 (good) based on Wemmer et al. (2006) Season notation as follows: LD05 – long dry season in the year 2005; SW05 – short wet season in 2005; SD06 – short dry season in 2006; LW06 – long wet season in 2006; LD06 – long dry season in 2006. Differences between translocated and local elephants were statistically significant for all seasons.

Figure 2.

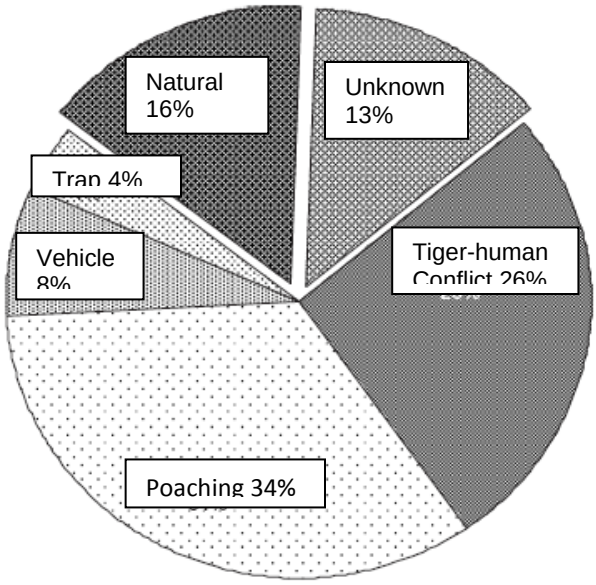

Figure 2. Causes of mortality for 53 tigers on and near the Sikhote-Alin Biosphere Zapovednik, based on confirmed reports from 1976 to 2001.

Figure 3.

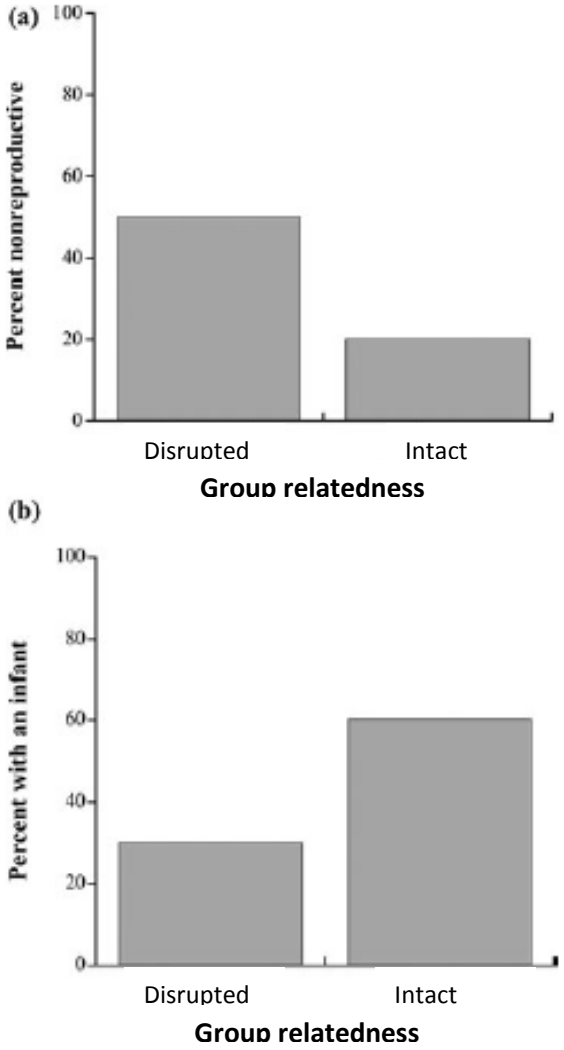

Figure 4. Percentage of female elephants in disrupted and intact groups that (a) were nonreproductive and (b) had an infant < 2 years old.

Figure 4.

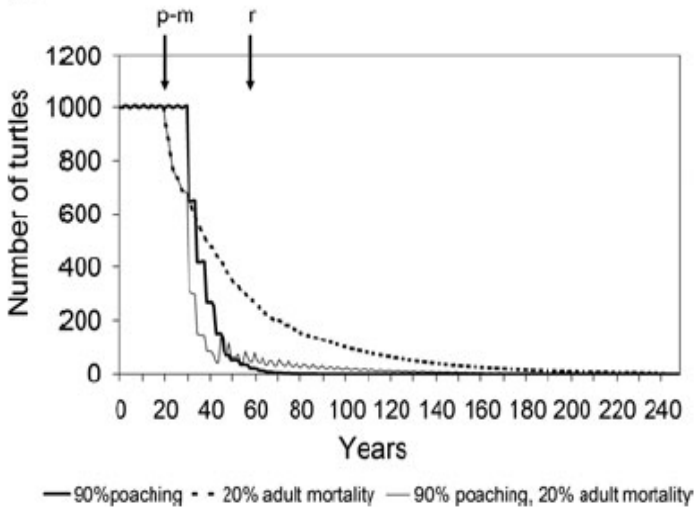

Figure 4. Effects on turtle population of 90% continuous poaching (solid black line), 20% annual adult mortality (dotted black line), and 90% poaching with cessation after the second drop in population with 20% adult mortality (p-m and arrow, time when poaching, adult mortality, or both start; r, time when relocation starts) (grey line).

Figure 5.

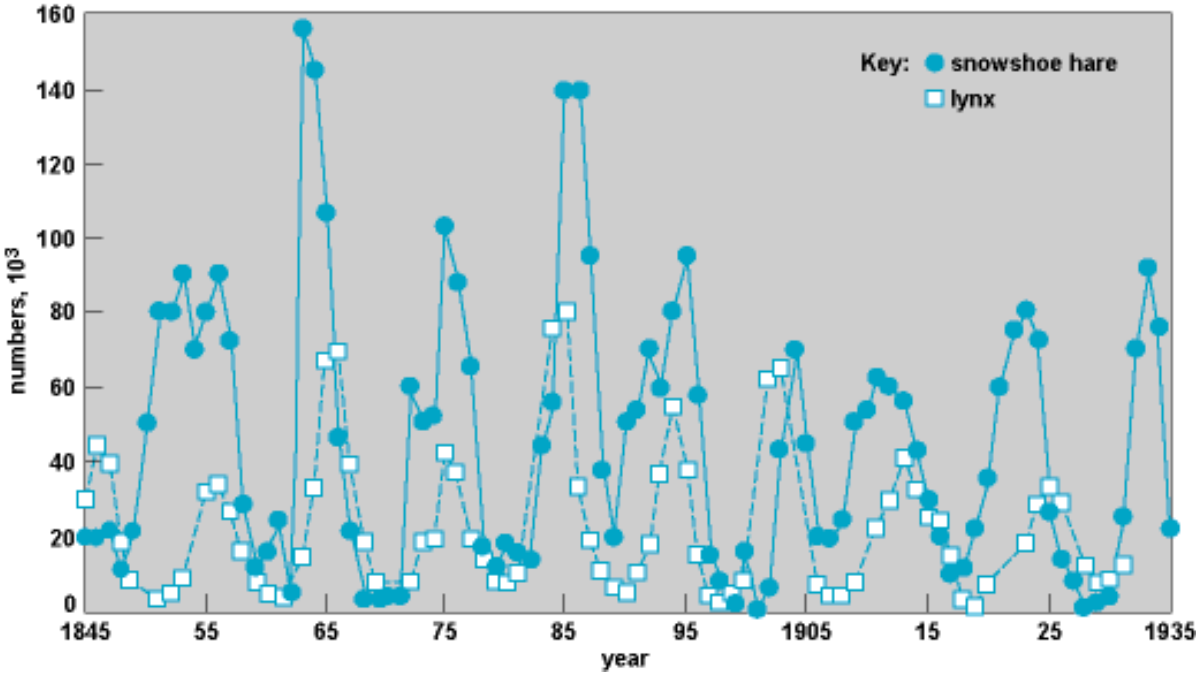

Figure A: Population dynamics of the snowshoe hare and lynx inferred from the numbers of pelts sold to the Hudson's Bay Company. (*After D. A. MacLuclich, 1937*).

Figure 6.

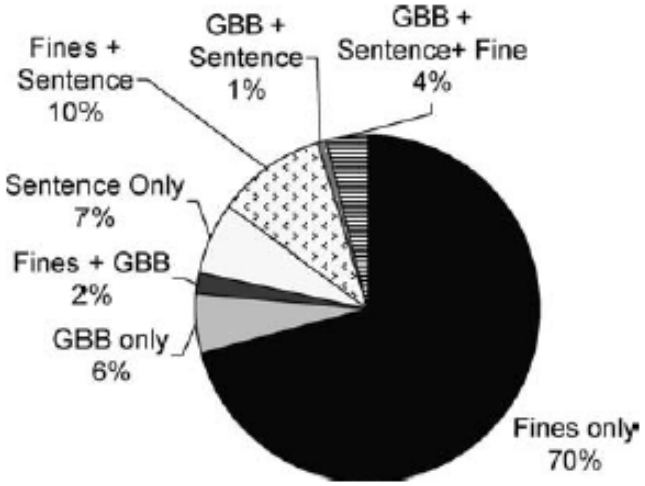

Figure 6. Types of penalties for wildlife case prosecutions from 1994 to 2007 reported by the Australian Customs Service Wildlife Prosecutions Database. GBB refers to a penalty of Good Behavior Bond where the defendant is released under strict conditions and non-compliance will result in imprisonment or a hefty fine.

Table 1.

Age	Capture			Cause of Death				
	Sex	Number		Poaching	Lethal Control	Natural	Unknown	Assumed Mortality
0-1 Years	Male	65		2	2	3	1	0
	Female	79		0	1	13	3	0
	Total	144		2	3	16	4	0
1-2 Years	Male	32		2	0	1	0	1
	Female	45		1	0	0	1	0
	Total	77		3	0	1	1	1
>2 Years	Male	37		4	0	1	0	7
	Female	57		5	4	9	2	8
	Total	94		9	4	10	2	15

Table 1. Cause of mortality of 144 juvenile, 77 subadult and 94 adult wolverines studied in the Laponia area during 1993 - 2008.

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