

Agriculture and its Effects on Jaguar Populations in Brazil



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Abstract

Brazil has had a long running history of agricultural and mining practices since the 1800s. Broken down by region, Brazil has many agricultural practices/exports for each area: Central Brazil was long thought to have an unsuitable landscape for many agricultural practices but lately has had much success in mechanized crop agriculture, particularly in growing soybeans even with poor soil for growing. For a long time, this area has also been home to much cattle ranching which is one of Brazil's key industries. The Southern region of Brazil is much more temperate than the Central and the Northern regions and produces much of the country's grains, export crops, and oilseeds. The Northern region is not a central for agriculture but still exports tropical fruits, cocoa, and other forest products. (Meyer 2010). The jaguar (panther onca) is a top predator in the Brazilian region whose range extends to most corners of Brazil with its suitable habitat being the Amazon rainforest on the west side of the country and the Atlantic Forest on the eastern side of the country. These places are ideal due to the dense cover and abundance of prey available to them. However, since agriculture production has risen in Brazil, many jaguars are being displaced due to deforestation/habitat lost and illegal poaching. This paper illustrates how this threatened megafauna continues to be displaced and its numbers keep dropping in Brazil.

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Introduction

Agriculture has been a part of Brazilian culture since Brazil's colonization in the 1800s. Many practices rose during that time period that still continue today such as cattle ranching, soybean, wheat, rice, corn, sugarcane, cocoa, citrus, and beef products. Many of these products benefit the lives of Brazil's inhabitants and people all over the world. For some this is their only means of making a living. Unfortunately, with all of these exports, lands must be cleared away, which in turn affects the native ecosystems and the species that inhabit those ecosystems. Without access to food, shelter, or water, the native wildlife becomes more and more limited. This includes the jaguar (panther onca). Jaguars are the top predators of their respective ecosystems and are becoming increasingly threatened due to the spread of agricultural practices and putting them into closer contact with people. With no habitat suitable to live in, an inconsistent source of food, and the stresses of being hunted/poached for fur or perceived dangers jaguars may cause, eventually jaguars may become increasingly endangered in Brazil or worse: extinct in Brazil.

Aims and Objectives

- The main purpose of this study is observe how the spread of agricultural practices has effected the range of the Jaguar and offer solutions to allow jaguars and people to co-exist without detrimental effects on the population of the panthera onca.

Causes of Agriculture Induced Deforestation

Agriculture has been around Brazil for many centuries now but has spread to great lengths, illegal lengths. Why are these practices continuing to be unmonitored and regulated? One major reason is the neglect of enforcement from the Brazilian government. The Economist wrote an interesting article in 2009 that explains that only a mere 14% of all lands in Brazil are privately owned and allowed to be in use for agriculture. Clearly there is much more land being cleared and sold than 14%, these deals for permits on cutting land stem from government bribes and corruption to line the politicians' pockets if they were to directly benefit from the practices the 'land owners' are using. These practices are protected under false documents with money and goods being traded under the watchful eye of the government.

Soybean production in Brazil is at an all-time high and exports are making Brazil (as well as private/corrupt investors) a lot of money. This is one of Brazil's main exports and each year, acres and acres of land are being cleared for this practice. Soybeans are also a primary source of not only nutrients but for the use of biodiesel as well. According to WorldInfo.org, soybean production has risen from 1.5 million tons to 57 million tons from the span of 1970 to 2006. Many other countries depend on the production of soybeans and the major importers of this crop are the United Kingdom and Germany who rely on the soybean production for their animal feeds. Soybeans (as well as other crops grown) have many uses both in Brazil and abroad.

Besides soybean production, cattle ranching is also another part of Brazil's economy, particularly in the Central Region of Brazil since the 1960s. These cattle herds require a lot of space to feed and roam within their ranches and land must be cleared in order to accommodate that much space. Beef demands are at an all-time high as well and millions of tons are produced each year particularly in Mato Grosso, Mato Grosso do Sul, Goiás and Minas Gerais (Meyer 2010). All of the land from these practices is being deforested and fragmented which is detrimental to the jaguar and its prey animals.

Background on the Jaguar in Brazil

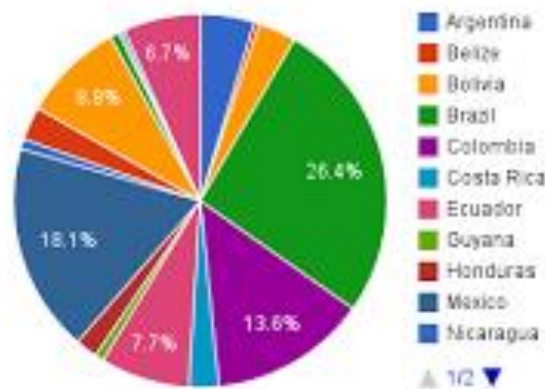


Figure 1. Jaguar population numbers as of 2011. Retrieved from Mariana Botero on March 11th, 2017. <https://sites.google.com/site/iemgec/final-project/mariana>

As shown in the figure above, a majority of the world's jaguar population lies within Brazil's forests and ecosystems, particularly in the Amazon rainforest and the Atlantic Forest. The figure below gives a more geographical representation of where jaguars are found in Brazil.



Figure 2. The Current range of the jaguar (panthera onca) as of 2014. Retrieved March 11th, 2017 from <http://www.panthera.org/node/10>

The jaguar itself is a solitary predator that has a home range of 19 to 53 square miles, many of which overlap with multiple female populations. The jaguar is the third largest cat in the Panthera genus and has pound-for-pound the strongest bite force of the big cats. It lives by the water, hunting unsuspecting prey such as black caiman, capybaras, and even turtles. Though it has a wider array of animals it feeds on, it primarily sticks to those listed above (Defenders of Wildlife 2017).

Though with the limiting factors such as the spread of agriculture, deforestation, and poaching, jaguar population numbers have decreased dramatically as shown in **Figure 3**.

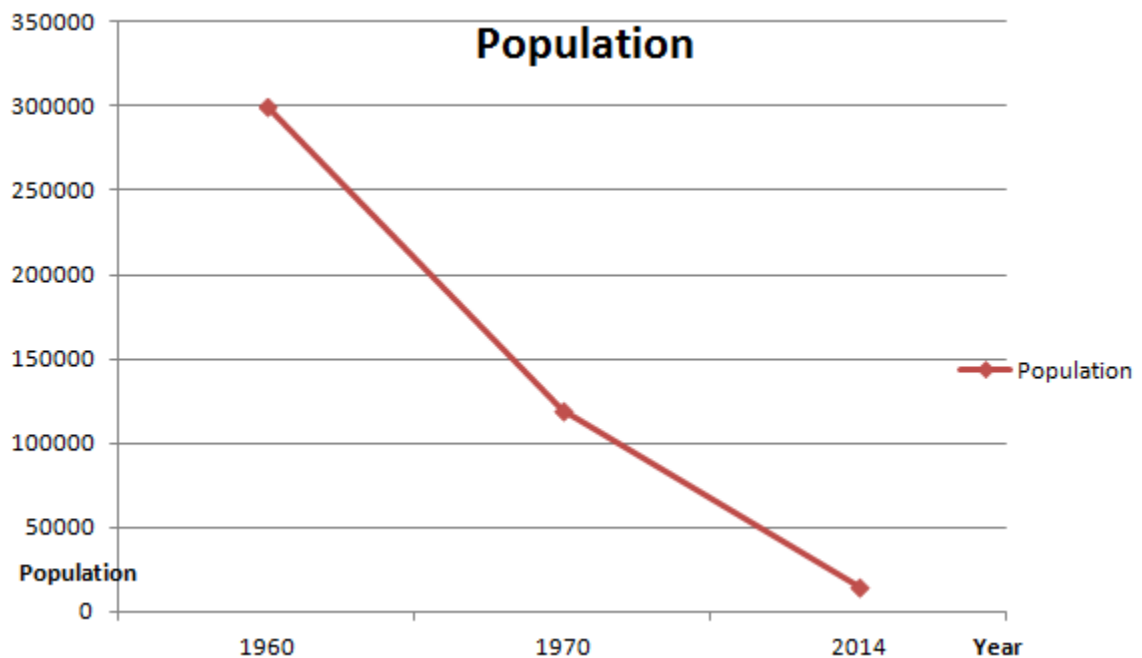


Figure 3. This graph shows the major decline of jaguars since 1960 to 2014 throughout its range (not just Brazil). Retrieved March 11th, 2017 from <http://population-dynamics-of-jaguars.weebly.com/population-growth.html>

Now the graph above shows the major decline of the jaguar throughout its whole range, not just Brazil. However, the reasons for decline are still similar: deforestation for agricultural purposes, and poaching (Haag 2010). With these habitats being fragmented, isolation of jaguar populations occur, preventing them from intersecting and mating, leaves them exposed to dangers such as poaching as they move throughout their home range, and limits their food and water sources. This also has a detrimental effect on their prey population as well, limiting their home ranges and populations, lowering their chances of survival as well.

With all of these factors being considered by the jaguars of this area, one prey source still remains abundant and easy to catch: cattle. A fully grown cattle could sustain a single jaguar for a week (give or take a few days). This causes jaguars and people to come into close contact. Ranchers are afraid of jaguars due to their intimidating appearance, robust figure, as well as their reputation as a top predator with teeth and jaws that are more than capable of killing a person.

Most people do not realize that jaguars are secretive and will only attack when cornered; they are more likely to flee than attack (Tobler 2013). Obviously, the ranchers/farmers want to protect their cattle from the threat of jaguars so they turn to poaching in order to eliminate competition from jaguars. This has a major effect on the population. As shown in **Figure 4** down below the number of legal amazon cattle herding is expanding more and more into the jaguar's home range. One poaching ring that was busted in 2010 revealed that over a 20 year period, 50 jaguars were slaughtered (on average) per year due to their close proximity to cattle ranchers (Neme 2010).

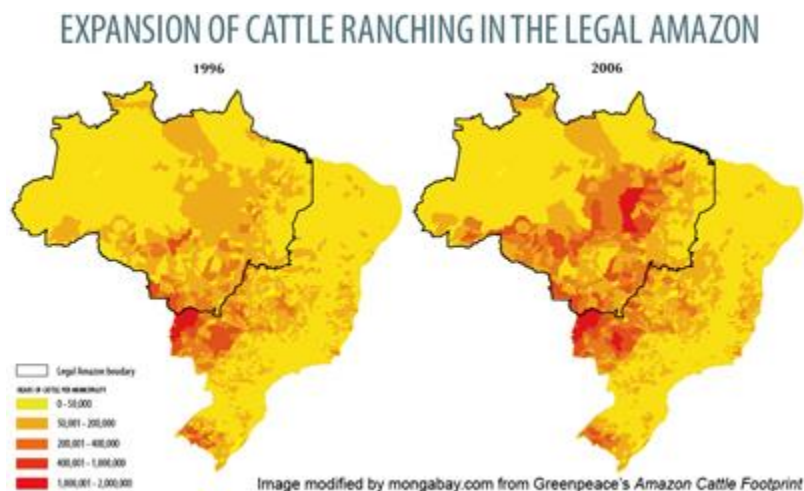


Figure 4. The expansion of legal cattle ranching in the Amazon from 1996 to 2006. Retrieved March 11th, 2017 from <https://news.mongabay.com/2009/09/activists-target-brazils-largest-driver-of-deforestation-cattle-ranching/>

Possible Solutions

Could jaguars and man live in harmony? Absolutely, but there must be some means of enforcing and educating the public on the nature of the jaguar. Many officials in the Brazilian government whose job it is to enforce these threatened species tend to look the other way in most cases when a jaguar is found dead, clearly from human interference due to the fact that ranchers sneak payments and supplies under the table to ensure that jaguars continuously get slaughtered for the sake of the crops grown (Paviolo 2016). Government enforcement (as well as certain acts being put into effect) and competent protection would be a huge asset to the survival of jaguars in Brazil. Limiting the amount of illegal ranching and farming areas of the Amazon and Atlantic Forests would be a much bigger difference in protecting the jaguars of those areas. With government officials staking out much of those areas, poaching and illegal agricultural activities may cease.

Another factor that could aid in the protection of jaguars is the education of the citizens who believe them to be a major threat. Jaguars are intimidating and beautiful creatures that deserve admiration, not destruction. These solitary and silent stalkers of the night are not out to

eat humans, in fact only 3 attacks were documented and reported in 2011 with only one resulting in a fatality (Neto 2011). Numbers of jaguar attacks rarely number outside of the realm of small single digit numbers per year (Srbek-Araujo 2016). It is important to adopt prevention tactics such as husbandry for the livestock and maybe even a guard dog to alert and take away the jaguar's stealth advantage, but educating the citizens that jaguars are not nearly as big of a threat as perceived may result in populations rising of these magnificent animals (Jędrzejewski 2017).

Conclusion

In conclusion. Agriculture has risen in Brazil for many centuries and is a huge part of their economy. However, the expansion of illegal agricultural activity and the unnecessary clearing of land is detrimental to many species including the jaguar. If there was more government involvement and protection of their natural homelands, as well as putting a halt to these illegal practices, jaguars may stand a chance of increasing their population numbers and continue living within Brazil.

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