

How a hunting boom left the Amazon Basin with 'empty rivers'

October 17 2016, by Carlos Peres, André Pinassi Antunes, And Glenn Shepard Jr



Credit: AI-generated image ([disclaimer](#))

The fashion for wild animal skins and furs drove a hunting boom in the Amazon basin through the 20th century. A mass industry sprung up almost overnight and the hides of otters, jaguars or alligator-like caimans were soon being shipped round the world to be turned into coats, hats or

accessories. The Amazon rainforest, and the animals that live there, are still feeling the impact today.

We've just used a gold mine of previously unanalysed historical documents and unpublished shipping records to properly quantify, for the first time, the scale of this skin trade. Our study, published in the journal [*Science Advances*](#), reveals that some species are far more vulnerable than others, and points out implications for future management of Amazonian forests and forest wildlife.

We documented the widespread decimation of large aquatic vertebrates, such as giant river otter, black caiman and manatee populations by commercial hunters, thanks to large amounts of obscure hide export data unearthed by the study. In contrast, terrestrial animals including collared peccaries (related to pigs), brocket deer and even jaguars were much more resilient to hunting pressure, even during the heyday of the luxury fur trade in the 1930s-1940s and again in the 1960s.

We estimate that, between 1904 and 1969, at least 23m animals representing 20 species of mammals and reptiles were killed for hide exports in the western Brazilian Amazon. These figures represent only those hides that were formally recorded in port landing records. They can therefore severely underestimate the total impact of hunting on wild populations, since many animals were fatally wounded but not retrieved by hunters, many skins rot and were discarded on their way to market, and a large portion of the harvest went undeclared to avoid taxes.



Jaguar, otter and ocelot pelts in a Manaus tannery, 1950s. Credit: Instituto Brasileiro de Geografia e Estatística (IBGE), Author provided

Eleven animal species were hunted most heavily: giant river otter, neotropical otter, black caiman, capybara, and manatees are all aquatic or semi-aquatic, in that they spend most of their lives in and around water. Giant otters, for example, were targeted as their dense fur could be turned into luxurious coats.

Jaguar, ocelots and margays (both small cats), collared and white-lipped peccary and red brocket deer all live on land and were also all among the most hunted animals. Between 1930 and 1970, hide exports from these species represented some US\$500m in trade in the four westernmost states of the Brazilian Amazon.

The Amazon's hunting boom

Commercial animal hunting took off in the Amazon after the collapse of international rubber prices in 1912, when plantation rubber from Malaysia made wild rubber commercially not viable. Initially, red brocket deer hides were the most popular export, though the trade soon became more intense and other animals were targeted, too.



Credit: AI-generated image ([disclaimer](#))

Things peaked during World War II, as the US sought wild rubber from the Amazon to make up for the capture of those same Malaysian plantations by the Japanese. Up to 80,000 people moved into the region to take up wild rubber tapping, and many developed a lucrative sideline

as hunters.

The 1960s saw a second peak of Amazonian animal hide exports as exotic furs became valued in the clothing and fashion industry. Even though Brazil officially banned hunting in 1967, loopholes permitting the sale of warehoused stockpiles of hides meant illegal hunting and hide exports continued until the ratification of the Convention on the International Trade in Endangered Species (CITES) in 1975. Demand for exotic furs continued through the 1980s, and it was only with the 1992 Rio Earth Summit that international opinion finally turned against the use of wild animal furs in fashion.

Aquatic animals were sitting ducks

We wanted to understand how resilient different animal populations were in the face of such intense commercial hunting. To do this, we looked at the number of certain species exported during peak harvest periods around World War II and again in the 1960s. We reasoned that, in those boom times, supply would fall only when numbers in the wild were beginning to be seriously affected.



Amazonian stand at the Brussels International world's fair, 1910. Credit: Instituto Geográfico e Histórico do Amazonas, Manaus, Author provided

One key finding is that aquatic species succumbed to the steepest declines. Mammals and reptiles that live along major Amazonian rivers and their tributaries, like giant river otters, black caiman or manatees, all suffered population collapse and local extinctions. Ecologists sometimes talk of "[empty forests](#)", where large animals have all died off. Here, we describe "empty rivers".

The Amazon forest remained far from empty, however, as land

mammals fared much better. Most, including jaguar, deer and collared peccaries, were more resilient to intense hunting pressure, showing little or no decline in peak harvest numbers despite constant or increasing demand.

There's a simple explanation for this: physical access. Floodplains and rivers make up just 12% of the surface area of the Amazon, and hunters travelled along rivers just like everyone else. Otters and manatees had a hard time avoiding humans, particularly in the dry season.

Jaguars, meanwhile, could disperse into extensive upland forest areas. Often extremely remote and far from humans, these forests acted as refuges where large game populations were not exploited and animals were able to absorb the losses of those that had wandered too close to humans. Ecologists call this phenomenon "[source-sink dynamics](#)" or refuge-harvestable area.



White-lipped peccary fur – as it's meant to be used. Credit: Katariina Järvinen

In fact, of the six terrestrial species that we assessed, only the white-lipped peccary showed significant population decline. As they travel in very large herds and are more susceptible to mass slaughter, these social animals will require special attention and conservation strategies.

Inaccessibility and source-sink dynamics contributed to the resilience of most terrestrial animal species during the Amazon's hunting heyday. The same spatial processes underpin indigenous and other forest peoples' hunting strategies to this day.

However, the refuge areas that maintain animal populations despite

continued hunting are under threat. Vast patches of forest are being chopped down or fragmented into smaller chunks, and roads, farms and dams are creeping ever further into the wilderness.

In order to ensure wildlife conservation and food security for forest peoples in the Amazon, forests and river systems must remain interconnected beyond the limits of strictly protected conservation areas. Indigenous territories and sustainable use reserves are an important part of any global conservation strategy. If road encroachment and forest fragmentation continue, even highly resilient terrestrial animals would see their populations collapse. And no one wants to see more "empty forests."

More information: A. P. Antunes et al. Empty forest or empty rivers? A century of commercial hunting in Amazonia, *Science Advances* (2016). DOI: [10.1126/sciadv.1600936](https://doi.org/10.1126/sciadv.1600936)

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