

Subsistence poaching found to have little impact on biodiversity in the Amazon's environmental protection areas

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The researchers installed 720 camera traps in 100 human communities inside and outside nine sustainable-use protected areas. Credit: Ricardo Sampaio

The presence of Indigenous communities and traditional river dwellers

in extractive reserves located in Legal Amazonia is not a threat to birds and mammals considered subsistence poaching targets, according to a study [reported](#) in the journal *Biological Conservation*.

Legal Amazonia is an area of more than 5 million square kilometers comprising the Brazilian states of Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima, and Tocantins. It was created by federal laws from 1953 to promote [environmental protection](#) and development in the area.

The article advocates wildlife and conservation management strategies to mitigate the negative effects of poaching. These include combating local consumption of sensitive species such as tapirs, peccaries and curassows, and the sale of bushmeat in [urban areas](#), mainly in the vicinity of cities and upland forest areas where fish and other aquatic protein sources are scarce or non-existent.

The study described in the article was part of the Ph.D. research of Ricardo Sampaio, an environmental analyst at the Chico Mendes Institute for Biodiversity Conservation (ICMBio), an arm of the Ministry of Environment and Climate Change.

The authors show that the abundance of local game species begins to fall about 5 kilometers away from the nearest human community. In ecology, local abundance means the number of individuals of a species in a particular ecosystem.

The researchers deployed 720 [camera traps](#) near 100 [local communities](#) inside and outside nine areas of central and southwestern Amazonia; five are Extraction Reserves (RESEX), two are Sustainable Development Reserves (RDS) and two are state-run forests.

The camera traps recorded the presence of 29 bird and mammal species

weighing more than 5 kg, including pacas, tapirs, curassows and guans. In areas where the community engages in or has access to sustainable fish farming, as in the case of the arapaima or pirarucu in the Middle Purus and Juruá River in Amazonas state, the pressure on terrestrial species from subsistence poaching is lower.

"The main finding of the study was that the key factor in changes in species diversity, abundance and biomass is distance from human communities. Even so, we observed that human communities have little impact on biodiversity, demystifying certain discussions that question the extent to which sustainable-use conservation units protect biodiversity. Community-based wildlife management can be a way to assure food security while also protecting biodiversity in these areas," Sampaio told Agência FAPESP.

The article was published just as environmental issues in the Amazon were coming to the fore again in the global debate on sustainable development, not least thanks to the [Belém Declaration](#), which called among other things for measures to increase "native vegetation stocks by means of financial and non-financial incentives, and other instruments for conservation".

The document was issued on August 8 by eight heads of state representing the signatories of the Amazon Cooperation Treaty Organization (ACTO) at the Amazon Summit in Belém, capital of Pará state.

"Practical results like the findings of our research project help create an environment for discussion and institutional processes to address the issue of subsistence poaching, which is a taboo in Brazil. The challenge now is to ensure that governments and agencies are aware of these findings and can translate them into practice," Sampaio said.

The study involved Ronaldo Gonçalves Morato, former head of ICMBio's National Center for Research and Conservation of Carnivorous Mammals (CENAP). An earlier [article](#) by Morato and his group showed that distance from urban centers and availability of aquatic protein are the factors that most influence perceptions of the sustainability of game hunting among communities living in conservation units.

The other authors of the *Biological Conservation* article are Adriano Garcia Chiarello, a professor at the Biology Department of the University of São Paulo's Ribeirão Preto School of Philosophy, Science and Letters (FFCLRP-USP) in Brazil, and Carlos Augusto Peres, a professor at the University of East Anglia in the United Kingdom.

This year, Peres won an International Champions Award in the inaugural Frontiers Planet Prize, as the lead scientist for one of the most promising recent research articles on sustainability-related topics. His prizewinning paper was [published](#) in the journal *PNAS*.

Pressure from poaching

According to the researchers, the study was one of the largest ever conducted using camera traps to assess the response of vertebrates to poaching in areas of the Amazon, which contains the world's most biodiverse tropical rainforest.

They also stressed that although the reduction in numbers of animals is due to pressure from poaching near human communities, the negative impact on the forest from more frequent fires, logging and domestic dogs used to hunt game may also drive away animals in the vicinity of communities. In fact, they found this to be the case for 13 of the species studied.

The findings have already had practical results, Sampaio said. When the researchers were doing fieldwork in the Riozinho da Liberdade RESEX (Acre state), the community there was discussing the effectiveness of a local agreement to regulate subsistence hunting, and there were disagreements about whether to allow dogs. They set up camera traps on both banks of the river.

Dogs were allowed only on the right bank. They showed the images to the community, proving that on the left bank, where no dogs were allowed, there were more wild animals (which the locals themselves referred to as "bushmeat" or "game").

"The meeting was attended by women and children as well as community leaders. They had lived in the forest all their lives, but many had never before seen certain animals before they saw these images," Sampaio recalled.

Some months later, he continued, he received the minutes from a meeting where the images were used to support a collective decision not to allow hunting dogs anymore. "This decision was eventually adopted in the management plan for the conservation unit, which has rules defined by the community.

It was one of the positive practical outcomes in terms of local decision-making and biodiversity conservation," said Sampaio, who advocates combining scientific knowledge with the traditional knowledge accumulated by river dwellers and Indigenous communities.

Brazil's federal legislation on [conservation units](#) establishes that extraction reserves are demarcated with the aim of protecting the livelihoods and culture of traditional people, such as river dwellers, Indigenous communities and quilombolas (inhabitants of quilombos, settlements originally formed by enslaved Africans who escaped in the

seventeenth and eighteenth centuries), and assuring sustainable use of natural resources in the area.

These communities may harvest ("extract") forest produce to earn a living while also practicing subsistence farming with some food crops and small animals. RESEX reserves are government property, and hunting by amateurs or professionals is banned.

More information: Ricardo Sampaio et al, Vertebrate population changes induced by hunting in Amazonian sustainable-use protected areas, *Biological Conservation* (2023). [DOI: 10.1016/j.biocon.2023.110206](https://doi.org/10.1016/j.biocon.2023.110206)

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