

Study demonstrates that indigenous hunting with fire helps sustain Brazil's savannas

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This is a Xavante elder during a collective hunt with fire in Brazil's Pimentel Barbosa Indigenous Reserve. Credit: James R. Welch

Indigenous use of fire for hunting is an unlikely contributor to long-term carbon emissions, but it is an effective environmental management and recovery tool against agribusiness deforestation, a new study from Indiana University and Brazil's Oswaldo Cruz Foundation has found.

Many [indigenous peoples](#) in Brazil have practiced hunting with fire, and today Brazil's Xavante Indians often use fire to hunt game for ceremonial occasions such as weddings and rites of initiation. While the practice has also often been blamed for causing deforestation and increasing carbon dioxide emissions, the new study dispels this popular myth.

Based on analysis of 37 years of satellite imagery and long-term fieldwork, the researchers determined that hunting with fire by the Xavante Indians actually maintained ecological integrity and sustained vegetation recovery in areas that were previously deforested by agribusiness in the tropical savannas, or cerrado, of Brazil.

According to the study, "Indigenous Burning as Conservation Practice: Neotropical Savanna Recovery Amid Agribusiness Deforestation in Central Brazil," the deforested area under indigenous management inside the Pimentel Barbosa Indigenous Reserve decreased from 1.9 percent in 2000 to 0.6 percent in 2010. In contrast, deforestation in surrounding lands remaining under agribusiness management increased from 1.5 percent to 26 percent during the same period. The new work was published today in the journal *PLOS ONE*.

Traditional indigenous burning in the cerrado is not usually destructive to plant and animal life and is unlikely to contribute to increased greenhouse gas emissions over the long term, said Oswaldo Cruz Foundation co-author Carlos Coimbra Jr.

"Xavante hunting fires burn low and cool because highly flammable dead biomass is not allowed to accumulate for many years at a time. This gives animals ample escape routes and allows fire-resistant plants to regrow," he said.

The study also found that fire originated by the Xavante Indians is well-

managed and contained.

"With ranches on all sides, Xavante hunters limit burning to hunting expeditions within the reserve," said lead author James R. Welch, also of the Oswaldo Cruz Foundation. "As a result, they work harder than ever to follow traditional protocols for where and when to use fire. By controlling fires according to the weather, winds, moisture and natural fire barriers, they successfully conserved the increasingly threatened cerrado vegetation."

In fact, since 2005, indigenous reserves have been responsible for more than 70 percent of the reduction in deforestation in Brazil, particularly in the Amazon and cerrado, according to study co-author Eduardo Brondizio.

"The Xavante situation at Pimentel Barbosa Reserve is emblematic of a puzzling phenomenon that is increasingly replicated throughout Brazil and the world: the formation of islands of environmental conservation surrounded by large-scale agribusiness," he said.

Brondizio is a professor in the IU Bloomington College of Arts and Sciences' Department of Anthropology and a faculty associate of the Anthropological Center for Training and Research on Global Environmental Change and the Ostrom Workshop in Political Theory and Policy Analysis, both research centers supported by the Office of the Vice Provost for Research at IU Bloomington.

The real challenge to conservation in the cerrado, he said, is not indigenous burning practices but how to achieve long-term sustainability of indigenous lands that are increasingly subsumed by agribusiness expansion. According to Brondizio, Xavante practices offer invaluable lessons regarding ecosystems and conservation.

"The Xavante show us how to maintain and use cultural practices to manage and recover the environment and call attention to the need to consider new governance systems that respect the rights of indigenous populations and promote conservation beyond reserves and protected areas," Brondizio says.

More information: "Indigenous Burning as Conservation Practice: Neotropical Savanna Recovery Amid Agribusiness Deforestation in Central Brazil," by James R. Welch and Carlos E. A. Coimbra Jr. of Escola Nacional de Saude Publica, Fundaca Oswaldo Cruz, Brazil, and Eduardo S. Brondizio of IU Department of Anthropology and the Anthropological Center for Training and Research on Global Environmental Change (ACT), and Scott S. Hetrick, also of ACT, was published Dec. 11, 2013, in *PLOS ONE*.

Provided by Indiana University

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