How interfering humans helped Amazon diversity

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Don't tell Sting, but human activity may not be all bad news for the Amazon. A study of South American savannahs suggests that even before Europeans arrived, farmers were changing ecosystems with a landscaping method previously unrecognised in the region. What's more, the pre-Columbian alterations may have increased biodiversity.

"Human actions cannot always be characterised as bad for biodiversity," says Doyle McKey of the University of Montpellier 2, France. "Some might be good."

McKey and his colleagues came to their conclusion after studying some strange features of the savannahs of French Guiana. These plains are flooded during the rainy season, dry and parched in the summer, and often burned by fires. It was while walking through this landscape that McKey started wondering about undulations in the terrain.

It turned out that they are mounds, mostly about 1.5 metres across and 30 centimetres high. McKey thinks that pre-Columbian farmers made them as beds for crops that drained well in the rainy season. Sure enough, when the team tested the mounds' drainage capacity, they found it was nine times as high as the seasonally flooded savannah.

New tenants

Once these fields were abandoned between 800 and 400 years ago, plants and animals colonised the mounds, creating a new ecosystem. Specifically, McKey's team found that the leaf-cutter ant *Acromyrmex octospinosus*, the predatory ant *Ectatomma brunneum* and the Nasutitermitinae subfamily of termites preferred to build their nests on the raised beds.

The *Acromyrmex*, which are fungus-growing ants, even transported large quantities of organic matter to their nest. This in turn has caused the plants on the mounds to grow bigger and their roots deeper. The consequent structural integrity of the mounds and their excellent permeability to water has protected them from erosion by flood waters.

McKey expects that the alterations have been beneficial for the biodiversity of the area. "It's clear that a savannah with this heterogeneity will have a higher biodiversity than just a flat savannah," he says.

Besides French Guiana, such mounds can be found in Surinam, Belize, Venezuela, Ecuador, Bolivia and Mexico. The new study is bound to further fuel the debate over whether most of the Amazon rainforest and the associated savannahs are pristine ecosystems. "To my mind, the debate has been too black-and-white," says McKey. "Nature and culture are interacting to produce interesting things, and maybe that the way this debate should go."

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