Tropical Park Fires Linked with Poverty

From EurekAlert!

According to the first global assessment of forest fire control effectiveness in tropical parks, poverty and corruption correlate closely with lack of fire protection in tropical moist forests. A better understanding of the links between corruption, poverty and park management will help conservationists and policy makers create sophisticated strategies to conserve tropical ecosystems.

The survey is published in the July issue of Ecological Applications, reported by lead author S. Joseph Wright, staff scientist at the Smithsonian Tropical Research Institute; Arturo Sanchez-Azofeifa and Carlos Portillo-Quintero from the University of Alberta; and Diane Davies from the University of Maryland.

“Satellite data on fire frequency provides a measure of park effectiveness across countries,” Wright said. “It is strikingly clear from our study that poverty and corruption limit the effectiveness of parks set up to protect tropical forests.”

The survey indicates that parks were most effective at reducing fire incidence in Costa Rica, Jamaica, Malaysia and Taiwan; whereas parks failed to prevent fires in Cambodia, Guatemala and Sierra Leone.

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To better distinguish functional parks from “paper” parks and to characterize the relationship between social factors and park protection worldwide, the team created an index comparing fire frequency inside and outside of 823 tropical and subtropical parks.

Low fire frequency within parks was chosen as an indicator of park effectiveness because the background level of fire in tropical moist forests is low, so the presence of fire often indicates that humans are engaged in timber extraction, clearing land for agriculture or other land-use conversion.

The frequency was based on fire detection data from NASA’s satellite-based Moderate Resolution Imaging Spectroradiometer (MODIS). “The MODIS fire products enable us to monitor global fires and see how fire regimes are changing,” said Chris Justice of the NASA MODIS fire team.

Wright added that satellite data has limitations. “The satellite data must be carefully screened. Perhaps the clearest examples of this system’s limitations were a park in Costa Rica and two parks in Indonesia where active volcanoes triggered the MODIS fire detection algorithm,” he said.

As part of this publication, fire frequency data from 3,964 tropical reserves will be posted online. The authors hope that other investigators more familiar with reserves in particular countries or regions will use these data to better understand the causes of fires in parks and their management implications.

Current Literature


Keighery, G.J., Gibson, N., van Leeuwen, S., Lyons, M.N., and


Molíanen, A., and Cabeza, M. 2007. Accounting for habitat loss rates in sequential reserve selection: simple methods for large...


