
Mining noise effects on Atlantic forest soundscapes

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Abstract

Anthropogenic noise is a growing concern among stakeholders since it causes negative impacts on animal communication and their wellbeing. Particularly, mining activity produces high levels of noise through heavy machinery, busy roads, explosions and frequent sirens during the day and night. An important part of the Brazilian economy is based on mining, which is often conducted in habitats considered biodiversity hotspots with many threatened and endemic species. The Atlantic forest biome is one of the habitats that is commonly affected by the mining noise. We characterized and compared the soundscapes of two different areas in the same Atlantic forest fragment in Southeast of Brazil: 1) noise-polluted environment – at a distance of 500m from the mine and 25m from the closest road - and 2) - quiet environment – at a distance of 2,500m from the mine - in order to establish the potential impact of noise from mining activities on animal communication systems. Six SongMeter Digital Field Recorders (SM2) (Wildlife Acoustics, Inc., Massachusetts) were installed and programmed to record continuously at 44.1kHz during seven days every two months from October 2012 to August 2013 in both areas (noisy and quiet). The data were subsampled

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by analyzing two minutes of recording every hour. The values derived by power spectra and a recently introduced index (the acoustic complexity index, ACI) were used to characterize anthrophony and biophony, respectively. Results were pooled by season (wet or dry) and time of day (day or night) to investigate significant modifications of the acoustic behavior of the community in respect to the level of noise produced by the mining activity. Power spectrum values were significantly higher in the noisy area and especially on weekdays, as expected, and the ACI values tended also to vary where and when noise levels were highest.

Keywords: soundscape ecology, noise pollution, tropical forest, community monitoring