
Soundscapes as a measure of ecological condition in grazed tropical dry forests in Madagascar

Anne Axel*^{†1}

¹Marshall University and Lyndsay Rankin – Department of Biological Sciences Science 260 One John Marshall Drive Huntington, WV 25755 Marshall University, United States

Abstract

Soundscape ecology explores the acoustic components of a landscape including sound produced by organisms (biophony), human activities (anthrophony), and physical processes such as rain and wind (geophony). Regular sampling of soundscapes across seasons can provide valuable data on phenological trends related to seasonal changes, as well as serve as a record of ecosystem change related to human disturbance (i.e., logging, agriculture, and livestock grazing). Here we relate acoustic indices derived from recordings taken over a one-year period to ecological conditions measured in forests experiencing different livestock grazing intensities in the Beza Mahafaly Special Reserve in southern Madagascar. Autonomous recording sensors were placed in both gallery and dry deciduous forests of different grazing regimes in January 2013. One minute acoustic samples were collected every quarter-hour for one year. Acoustic metrics such as the Bioacoustics Index, the Acoustic Complexity Index, and the Acoustic Entropy Index were used to characterize differences in the soundscape. Results indicate that soundscape indices derived from acoustic data can differentiate between forest types. In addition, soundscape indices also reflect differences in grazing intensity suggesting that acoustic information may be a good indicator of forest condition in this human-dominated landscape.

Keywords: acoustic index, grazing, Madagascar, forest condition, soundscapes, tropical dry forest

*Speaker

[†]Corresponding author: axel@marshall.edu