



93rd ESA ANNUAL MEETING

Sunday, August 3 - Friday, August 8, 2008

The Midwest Airlines Center - Milwaukee, Wisconsin

Monday, August 4, 2008 - 2:10 PM

COS 12-3: Bioacoustic versus traditional point counts of forest songbirds along an urban to rural gradient in Southeastern Michigan, USA

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Background/Question/Methods

In the United States, anthropogenic landscape change is occurring most rapidly at the interface of urban and rural communities (i.e., the urban-rural interface). Because of such rapid changes, these interface areas are critical in understanding the avian-ecological effects of human-induced landscape change. To provide a comprehensive forest-bird community assessment, and to alleviate the constraints of a short field season and limited expert birders, we employed digital, omni-directional bioacoustic recordings to perform point-count sampling during the 2006 and 2007 breeding seasons in Southeast Michigan. While the validity of similar acoustic recordings has been verified by Hobson and others in the mixed forests of central Canada, similar verification has not been documented for more developed landscapes, where additional sounds associated with human activity can contaminate the signal. The goal of this research was to investigate the effectiveness of bioacoustic recording equipment versus expert birding (and traditional point counts) along an urban-rural gradient. We selected sample locations within publicly accessible conservation and recreation lands that were surrounded by diverse land covers and distributed within four strata of housing densities (urban, suburban, exurban, and rural; USER). Within the forest patches, avian species, abundance, and location data were collected during the 2007 breeding season by expert birders and simultaneously recorded using compression-zone microphone (CZM) technology. Two 180-degree CZM microphones were used in concert to collect stereo recordings of all singing birds. Using the recording equipment allowed us to review our samples, both audibly and visually (via recording generated sonograms), to ensure correct species identification. We compared species diversity, abundance, and percent similarity of all singing forest birds recorded by the acoustic recordings against those recorded during field observations.

Results/Conclusions

We found that the interpretations based on the recordings, though not in perfect agreement with field-based observations, can serve as an effective point-count mechanism. The recording-based interpretations describe, on average, better than 90% of the species richness and better than 80% of abundance compared with traditional field observations, and provide a nearly 70% match when accounting for richness and abundance simultaneously (via the percent similarity index). Our analysis suggests that the results are similar along the entire USER gradient, leading to a general conclusion that using CZM stereo-recordings for avian point-counts are equally effective at all levels of human influence found within our study area

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