**MS Thesis Defense**

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**Title**: An Investigation Of How Vehicular Noise Mitigation Affects Acoustic Communication In Avifauna

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## ABSTRACT

Noise disturbance affects acoustic communicative behaviors of terrestrial species and has become an increasingly widespread problem as urbanization and traffic densities continue to rise. This study investigated whether the acoustic behavior changed between birds inhabiting plots exposed to a 36 hour weekly road closure and birds inhabiting territories with a non-regulated temporally shifting noise condition. Mixed-effect general linear models were used to account for environmental variables generally known to affect bird song, including vegetation, temperature and humidity, and high and low-band noise across microsoundscapes. The models are unique in that they contained A-weighted equivalent continuous sound pressure level noise measurements (LAeq) of low-band traffic noise and high-band biotic background noise taken within 20 seconds of each measured song. Analysis of acoustic recordings within parks in the Washington metropolitan area indicate that routine, temporary relief from traffic noise influenced acoustic behavior in both the Eastern wood-pewee, a suboscine, and the Northern cardinal, an oscine. Interestingly, Northern cardinal song measurements were significantly affected by noise condition and its interaction with low-band traffic noise, but not by low-band traffic noise alone. Noise condition and its interaction with low-band traffic noise had a significant effect on the duration of Eastern wood-pewee songs, while low-band traffic noise, rather than noise condition, had a significant effect on the minimum frequency of their songs. A greater understanding of how animals respond to noise and noise reduction will be useful for constructing soundscape conservation plans.