

Wildlife Team: Songbirds and Chronic Industrial Noise

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Project Summary

Male songbirds rely on songs for territorial defense and to attract females. Noise from human activities can alter the quality of the acoustic environment for birds. Songbirds typically react to noise by avoiding areas where the noise comes from or by changing their songs to increase the transmission of their songs. These insights stem from studies carried out in comparative settings (no noise versus very high levels of noise). Less is known about songbird responses to gradients of noise in disturbance settings related to the oil and gas industry (well sites, traffic noise, compressor stations, and facilities). We investigated if industrial noise from the energy sector 1) influenced songbird occupancy (species presence/absence at a set of sites), 2) the detection of birds (i.e. whether we can hear them or not), and 3) interacts with amount of vegetation disturbance. Unlike past studies we included actual measurements of sound intensity (decibel levels) to quantify the noise gradients. All occupancy and vocal responses were measured using autonomous recording units (ARUs) deployed in 300 sites.

Management Implications and Lessons Learned

Previous studies in our lab found that White-throated Sparrow, Yellow-rumped Warbler, and Red-eyed Vireo were less abundant directly adjacent to compressor stations in mature aspen forest. Ovenbird also showed decreased reproductive success in noisy areas. Lincoln's Sparrow, Tennessee Warbler, Swainson's Thrush, and Hermit Thrush were tolerant to industrial noise. By looking at the amount of disturbed vegetation and noise at the same time we found somewhat different effects in mixed forests of different ages. Yellow-rumped Warbler was less likely to occupy noisy sites but using decibel level as the predictor we found the proportion of area disturbed by energy sector activities and the proportion of conifers was more important than noise. The White-throated Sparrow is often found in younger forests like those created by exploratory wellpads and pipelines. Such areas were often in noisier places and the White-throated Sparrow was better predicted by area disturbed than noise level. Lincoln's Sparrow and Tennessee Warbler were more likely to occupy more sites with higher levels of industrial noise. We are finalizing results from other species, but these results suggest an interaction between vegetation disturbance and noise that can alter how important noise is per se. Noise does impact some species, but some can also adapt. Changes in vegetation structure seem to be more important than the noise impacts for species capable of using disturbed vegetation.

Publication(s)

Sánchez, N.V. and Bayne E.M. Occupancy of songbirds in the context of chronic industrial noise: loudness matters. (*In prep*)