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# Shift in Songbird Vocalizations Suggest Possible Threats of Acoustic Masking for Human Health

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## Abstract

Global change, including increased anthropogenic noise, has been linked to multiple human health concerns. To further examine potential impacts of rising anthropogenic noise on health, we conducted an acoustic analysis of the response of songbird vocalizations in upstate South Carolina to traffic noise across an urban-rural gradient. Our data demonstrate that even moderate levels of noise alter the structure of avian vocalizations. In particular, Brown-headed Nuthatch (*Sitta pusilla*) bottom of vocalizations shifted upward to avoid overlap with the increased ambient noise associated with vehicular traffic. Eastern Towhee (*Pipilo erythrophthalmus*) bottom of vocalizations display the same shift, though only in the final ‘tea’ component of their call.

Vocalization adjustment to overcome acoustic masking reduces reproduction and survival and the effects of noise pollution on inter-species reactions are only now being identified. Understanding the impacts of anthropogenic noise on bird health provides insight into ecosystem health as well as human health. Thus it is essential that we understand the impact of this noise pollution on the ecosystem and implement effective and efficient conservation strategies to protect global ecosystem and human health.

**Keywords:** soundscape, anthropogenic noise, traffic, avian vocalizations, acoustic masking, human health, conservation

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