

*Quieting soundscapes increases birds, heightens human experience and amplifies support for conservation*

Mitchell J. Levenhagen, Zachary D. Miller, Alissa R. Petrelli, Lauren A. Ferguson, Yau-Huo (Jimmy) Shr, Dylan G.E. Gomes, B. Derrick Taff, Crow White, Kurt Frstrup, Christopher Monz, Christopher J.W. McClure, Peter Newman, Clinton D. Francis, Jesse R. Barber

Burgeoning urbanization has led to fewer opportunities for people to experience environments that are naturally quiet. Decades of research now clearly indicate that intense sound levels from anthropogenic noise negatively effects humans and wildlife alike. Noise increases stress, sleep disturbance, fatigue, blood pressure, and the risk of heart attack in people. Similarly, human-created noise alters animal behaviour, animal habitat use, and an animal's ability to reproduce and raise young. We experimentally altered human-caused sound levels on a trail system in Muir Woods National Monument, California, USA using informational signs that encouraged visitors to maintain natural quiet. We deployed these signs along the trails in alternating week-on, week-off blocks to test if the soundscape influences both wildlife and human experiences. We found that our use of signs lowered sound levels, thereby increasing the area over which a bird or human can hear by one quarter. As sound levels declined, bird numbers increased. Visitors reported hearing more birds when signs were present and the park was quieter. Importantly, when sound levels were reduced in the park, visitors ranked their experience in the soundscape as more pleasant and showed greater preferences for soundscape management,

such as closing trails during dawn and dusk. Under sign-based mitigation, sound levels throughout the park decreased to a level that would support 20% more people. This increased number of 'quiet' visitors would have the same or better individual soundscape experience as when the park supported fewer, more noisy visitors. Defining an acoustic carrying capacity may be a useful and easily quantifiable metric to manage national parks and other protected areas. The positive feedback cycle we describe here may lead to increased conservation support in a time when the extinction of nature experience looms.



*Soundscape mitigation signage in Muir Woods National Monument, USA. Photo credit: Jesse Barber.*

Plain language summary from article:  
Levenhagen MJ, Miller ZD, Petrelli AR, et al. Ecosystem services enhanced through soundscape management link people and wildlife. *People Nat.* 2020;00: 1–14.  
<https://doi.org/10.1002/pan3.10156>