

Noise pollution appears to cause some birds to change their songs making them less attractive

August 31 2011, by Bob Yirka



Great Tit, *Parus major*. Image: Wikipedia

(PhysOrg.com) -- Most everyone knows that modern pollution causes a lot of problems for the other animals trying to exist on this planet. Chemicals in the air and water make animals sick or kill them; urban sprawl allows them fewer places to live and now apparently it seems that even the noise we humans create causes animals to suffer in previously unknown ways. Wouter Halfwerk, a behavioral ecologist at Leiden University in the Netherlands and his colleagues have published a paper in the *Proceedings of the National Academy of the Sciences* that shows that some birds find themselves forced to change their mating songs as they compete with noise pollution which results, in some cases, in the male birds being cheated on by their supposed mates.

In a prior study, Halfwerk had found that certain [male birds](#) that were forced to compete with [highway traffic](#) often resorted to singing higher in order to be heard. Whether doing so was having a positive or negative impact on the birds as a whole wasn't so clear however, so this time around he and his team decided to look closer by studying not just the change in songs, but in discovering who was actually mating with whom as a result.

To find out what was going on, Halfwerk and his team chose to study the [great tit](#), the same species studied in his earlier work; a bird that is capable of changing the frequency of its songs. They recorded the songs of 30 random male birds during the mating season in the Netherlands. In doing so, they found that the males sang at their very lowest just before the females began laying their eggs, indicating it was the low frequency songs that really made the difference for the females.

After the eggs hatched, the researchers conducted paternity tests on the newborn great tits to see which males had won out in the end, but also to see which males were actually also being duped into raising the young of another male. The results showed that those males that had been forced to sing higher than they would have liked, wound up losing out to those that stuck with the lower frequency songs, which means other males had swooped in at the last moment with their low songs enticing the females out of the nest for one last tango just in time to fertilize her eggs.

To further confirm their findings that team also took a more direct approach; they played both high and low pitched prerecorded male songs to females sitting in their nest boxes to see which would cause them to emerge and found that the low frequency songs were more effective. This all changed when they pumped low frequency background noise into the environment, however, making it difficult for the females to hear the songs; only then did they go for the males singing the higher frequency tunes.

This all shows, the team says, that [noise pollution](#) can have a [negative impact](#) on bird populations, putting serious dents in the process of allowing the female birds to be fertilized by the best available mates, which could in the end, put the species at risk.

More information: Low-frequency songs lose their potency in noisy urban conditions, *PNAS*, Published online before print August 29, 2011, [doi:10.1073/pnas.1109091108](https://doi.org/10.1073/pnas.1109091108)

Abstract

Many animal species communicate with their mates through acoustic signals, but this communication seems to become a struggle in urbanized areas because of increasing anthropogenic noise levels. Several bird species have been reported to increase song frequency by which they reduce the masking impact of spectrally overlapping noise. However, it remains unclear whether such behavioral flexibility provides a sufficient solution to noisy urban conditions or whether there are hidden costs. Species may rely on low frequencies to attract and impress females, and the use of high frequencies may, therefore, come at the cost of reduced attractiveness. We studied the potential tradeoff between signal strength and signal detection in a successful urban bird species, the great tit (*Parus major*). We show that the use of low-frequency songs by males is related to female fertility as well as sexual fidelity. We experimentally show that urban noise conditions impair male–female communication and that signal efficiency depends on song frequency in the presence of noise. Our data reveal a response advantage for high-frequency songs during sexual signaling in noisy conditions, whereas low-frequency songs are likely to be preferred. These data are critical for our understanding of the impact of anthropogenic noise on wild-ranging birds, because they provide evidence for low-frequency songs being linked to reproductive success and to be affected by noise-dependent signal efficiency.

© 2011 PhysOrg.com

Citation: Noise pollution appears to cause some birds to change their songs making them less attractive (2011, August 31) retrieved 23 December 2024 from <https://phys.org/news/2011-08-noise-pollution-birds-songs.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.