Croaking chorus of Cuban frogs make noisy new neighbors

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Human-produced noises from sources such as traffic and trains can substantially impact animals, affecting their ability to communicate, hunt, or even survive. But can the noise made by another animal have the same detrimental effects? A new study presented at the 21st International Congress on Acoustics (ICA 2013) examines the calls made by an invasive species of tree frog and suggests the answer is yes.

Ecologist Jennifer Tennessen, a graduate student at The Pennsylvania State University, and her colleagues recorded the calls of the Cuban tree frog (Osteopilus septentrionalis) – an invasive species that had arrived in southern Florida by the 1930s and spread rapidly, eventually establishing populations throughout the southeastern United States. Tennessen and colleagues measured the effect of those calls on the acoustic behavior of two native species of tree frogs in southern Florida: green tree frogs, which have an acoustic signature that is similar to that of the Cubans, and pine woods tree frogs, whose song is different.

"We predicted that Cuban tree frog chorusing would interfere most with native tree frogs whose acoustic behaviors were similar," she said, "and that these would be the most likely candidates to modify their acoustic behavior to avoid interference."

During controlled playbacks of the chorus of the Cuban tree frogs, the researchers found, green tree frogs doubled their call rate – the number of calls per minute. The call rate of pine woods tree frogs, in contrast, did not notably change. "By increasing their call rate, green tree frogs

may be able to increase the likelihood that potential mates can detect them amidst the noise," Tennessen said. "This response, however, likely comes at the cost of requiring additional energy, which could be detrimental as it may divert energy away from other important functions like digestion and immune function."

Because they're essentially making more sound – which makes them easier to spot – green tree frogs may also be more vulnerable to predation, Tennessen said.

And the effects aren't just limited to the tree frogs. Adding the Cuban tree frog chorus to the "soundscape" of the ecosystem might use up valuable acoustic space, Tennessen said, "impairing the communication of a variety of different species – from frogs and toads to birds and insects – that rely on sound for survival and reproduction."

The presentation 4pAB4, "Impacts of acoustic competition between invasive Cuban tree-frogs and native treefrogs in southern Florida," is in the afternoon session on Thursday, June 6. Abstract: asa.aip.org/web2/asa/abstracts … h.jun13/asa1236.html

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