Fear affects predator-prey relationship: study

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(PhysOrg.com) -- Franklin D. Roosevelt famously warned the only thing we have to fear is fear itself. New research from The University of Western Ontario reveals that FDR's rhetorical flourish also accurately reflects a fundamental truth within the animal kingdom too.

In a study published in *Science*, findings from a team led by University of Western Ontario biology professor Liana Zanette prove perception – in this case, fear – of predation risk is powerful enough to affect wildlife populations even when predators are prevented from directly killing any prey.

"The traditional view of predators is that they kill prey, and that direct killing is the only way predators can affect prey numbers," says Zanette, a principal investigator at Western's Advanced Facility for Avian Research. "But predators also scare prey and wildlife live with this fear of being torn limb from limb by some predator every moment of every single day of their entire lives. This state of fear can be as important as direct killing in reducing prey numbers."

The ground-breaking research was conducted on song sparrows nesting in British Columbia's southern Gulf Islands. The researchers first protected every song sparrow nest from predators by surrounding them with netting and electric fences.
The researchers then played different sounds to different groups of birds throughout the four-month breeding season. One group heard sounds associated with their natural predators while the others heard non-

threatening natural sounds.

Zanette and the team discovered that the birds that heard the predator sounds produced 40 per cent fewer offspring. Such large reductions in numbers due simply to the sound of fear, unambiguously show for the first time in any wild bird or mammal that predators do significantly affect the population sizes of their prey not just by killing prey, but by scaring them as well.

“This has important implications for conservation and wildlife management because it suggests that the total impact of predators on prey populations will be underestimated if the effect of fear itself is not considered,” adds Zanette. “This means that the adverse effects of introduced predators are likely worse than previously imagined and the disturbance to native ecosystems due to the loss of native predators has probably been greater than we previously thought.”

Provided by University of Western Ontario