

# Fear of predators shapes entire ecosystems

November 2 2020, by Angela Nicoletti

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It doesn't take much for a predator to terrify their prey. No tricks. No treats. Just good old-fashioned fear of being eaten.

A predator could just be exploring and wandering around—perhaps not even in the mood for its next meal. But [prey](#) don't care about a predator's

intent—they know what could happen and that's enough. That fear is a good thing for not only the prey but also for maintaining healthy, balanced ecosystems.

FIU marine ecologist Mike Heithaus and University of Washington ecologist Aaron Wirsing collaborated with colleagues from Yale, University of Illinois at Chicago and more to examine the "ecology of fear"—or the ripple effect that predators have on the behavior of prey. They wanted to better understand the different stages of predator-prey interactions that don't necessarily end with someone getting eaten.

They found examples from across the [animal kingdom](#) to understand when fear of predators matter most to their prey and ecosystems. In most casess, when predators are present, prey move to areas that give them a better chance of escape. For example, mule deer move to higher-elevation places to avoid gray wolves. Grasshoppers avoid areas where spiders sit and wait. Gerbils don't forage for as long when hungry barn owls are actively hunting.

Heithaus, who is also dean of the College of Arts, Sciences & Education, and Wirsing also looked at an example from their own research.

They have conducted one of the world's most in-depth studies on sharks—answering critical questions about how sharks live and function, as well as how they help maintain healthy populations of other animals and even ocean plants. In Shark Bay, Australia, dolphins, dugongs, [green turtles](#), sea snakes, pied cormorants and fish are all on the menu for tiger sharks. When they enter the bay, tiger [sharks](#) head to the shallower waters where prey spend time. And the other animals quickly scatter and move to safer areas where they can hide or escape.

By taking a closer look at these subtle shifts in movement and changes in behavior, scientists can better predict when a loss of a [predator's fear](#)

factor could cause dramatic changes in the environment.

The review was recently published in *Ecology Letters*.

**More information:** Aaron J. Wirsing et al. The context dependence of non-consumptive predator effects, *Ecology Letters* (2020). [DOI: 10.1111/ele.13614](https://doi.org/10.1111/ele.13614)

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