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Exploiting Olfactory Habituation with Unrewarding Prey Cues to Reduce Unwanted Predation

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ABSTRACT: Two fundamental processes in predator-prey interactions have never been exploited in pest control. First, predators constantly make foraging decisions to maximize their energy intake, thereby ignoring unrewarding food cues; and second, predators and prey frequently use chemical mimicry to avoid being recognized. Given olfaction is the primary sense of most mammalian species, we tested whether we could deceive generalist mammalian predators into ignoring the odor cues of secondary prey by repeatedly providing prey odor with no food reward until predators gave up and searched elsewhere. We habituated predators in the wild to bird odor by exposing them to odor extracted from commercially available bird species before native birds (double-banded plover, wrybill, pied oystercatchers) arrived for nesting. We continued the odor treatment during nesting to camouflage the birds' real odor from that of the extracted odor. Chick production over a 25- to 35-day period in treated areas was 1.7 times greater compared to non-treated areas, after which treatment effects disappeared. These results suggest that filtering of rewarding and unrewarding food cues by generalist predators is powerful enough as a conservation management tool to protect secondary prey species temporarily without removing a single predator.

KEY WORDS: animal habituation, native birds, olfactory habituation, predator-prey interactions, reduced predation, unrewarded prey cues

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