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Adam J. Knox

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Amy Yackel Adams

Robert N. Reed

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# Evaluating Airsoft Electric Guns for Control of Invasive Brown Treesnakes

**Adam J. Knox**

Maui Invasive Species Committee, Wailuku, Hawaii

**Björn Lardner**

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, Colorado

**Amy Yackel Adams and Robert N. Reed**

U.S. Geological Survey, Fort Collins Science Center, Fort Collins, Colorado

**ABSTRACT:** Firearms are often used in lethal control of invasive vertebrates, but safety and regulatory aspects limit the circumstances under which they can be used. During August 2016 at the Brown Treesnake Project laboratory on Guam, we evaluated hobby-grade Airsoft Electric Guns (AEGs; a lower powered, less-hazardous, and less-regulated alternative to firearms) for capture and control of small animals, with specific emphasis on invasive brown treesnakes (*Boiga irregularis*). Tests of AEGs differing in power with ammunition (plastic pellets) masses ranging from 0.20 to 0.39 g, fired at gelatin blocks from distances of 4, 8, and 12 m, showed that heavy ammunition is of overriding importance for maximizing lethality: 0.39-g pellets penetrated more deeply at 12 m than did 0.20-g pellets at 4 m. Inspection of tissue damage in brown treesnake carcasses subjected to fire with the 0.39-g ammunition from the same distances suggested that injuries sustained by a direct hit from 12 m would often be lethal, and snakes would be unlikely to survive multiple hits from automatic fire discharged at approximately 17/s. Limited trials with live snakes helped us to understand behavioral responses in a snake hit by  $\geq 1$  pellets, including distance traveled over time. Based on these factors, we assessed the risk that a snake injured by pellet fire might evade subsequent capture by rapid responders in the proximity. We also discuss ethical considerations and regulatory advantages of using AEGs.

**KEY WORDS:** *Boiga irregularis*, brown treesnake, Guam, invasive species, pest control, rapid response, regulations, safety, specimen collection

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