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Comparison of Small Mammal Traps for Conducting Biological Surveys

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Abstract

Two biological surveys for small terrestrial mammals were conducted to determine species presence at Wallops Island National Wildlife Refuge (NWR) and the Millersville University Biological Preserve (MUBP). Data was collected using Sherman traps and a novel camera trap, MouseCam. Results from each trap were compared to determine the efficacy of MouseCams relative to Sherman traps. Both trap types yielded similar results but MouseCams required less labor and required no physical capture of mammals.

Introduction

The presence, richness and diversity of small mammal species are strong indicators of environmental health (Avenant 2000; Flowerdew et al. 2004; McCleery et al. 2014). Live trapping and camera trapping can provide reliable information on species presence. However, each trapping method is susceptible to factors that may impact accuracy of survey findings (Umetsu et al. 2006).

Sherman live traps are a traditional survey technique successfully used to study small terrestrial mammal populations, but they have constraints (Boonstra and Rodd 1984; Kelt 1996; Torre et al. 2004, 2010). Sherman traps may yield little information about species that are difficult to capture (Hammond and Anthony 2006; De Bondi et al. 2010; Romairone et al. 2018), they allow for only a single animal capture per night, and animals are confined in the trap until they are manually released.

Camera trapping utilizes fixed cameras that automatically take images when infrared sensors are triggered by animal movement (Rowcliffe et al. 2008; Rovero et al. 2013). Camera traps allow for the detection of multiple individuals per trap, per night and animals are not confined or handled. However, a major historical limitation of camera traps was their inability to detect and identify small mammals (De Bondi et al. 2010; McCleery et al. 2014; Hobbs and Brehme 2017).

Our goal was to determine if small mammal detection differed between the two trap types. For this study, two biological surveys were conducted to determine the efficacy of live trapping and camera

trapping to inform future wildlife surveying efforts for small terrestrial mammals.

Materials and Methods

Live Traps

Sherman traps were baited with sunflower seeds and placed 10m apart along both sides of trails found in the study sites. A total of 50 live traps were deployed at Wallops Island NWR and 20 were deployed in the MUBP.

Camera Traps

Camera traps were modified into "MouseCams", designed by R.D. Dueser and J.H. Porter of the University of Virginia. MouseCams consisted of camera traps being housed within two 5-gallon buckets with a fitted lid. Two openings were cut directly across from one another into the rim of Bucket 'A' to allow animals to move in and out of the trap (Appx. A). A camera was fixed in place facing the bucket lid. A cup was attached to the inside of the lid to hold bait along with two wooden blocks designed to keep nuisance species from reaching the bait (Appx. A). Bucket 'B' was then placed atop Bucket 'A' (Appx. A). Ten assembled MouseCams were placed along with live traps at Wallops Island NWR and three MouseCams were deployed along with live traps at the MUBP. MouseCams were baited with sunflower seeds, checked once during their deployment, and rebaited as necessary.

Results

Both Sherman traps and MouseCams detected the presence of 2 small mammals (Peromyscus leucopus and Blarina brevicauda) (Appx. B) on both Wallops Island NWR and the MUBP. Wallops Island NWR experienced 17 total capture events, 9 being from Sherman traps and 16 being from MouseCams. The MUBP experienced 155 total capture events, 7 being from Sherman traps and 148 being from MouseCams.

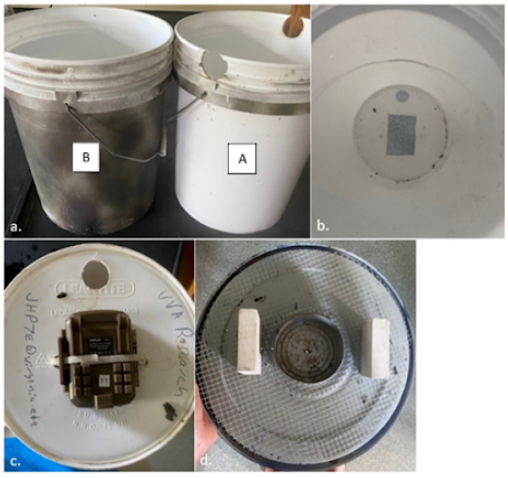
Discussion

Based on the results of our biological surveys, we found that Sherman traps and MouseCams produced similar results when detecting the presence of small terrestrial mammals. McCleery et al. (2014) also found that modified camera trapping yielded similar results to live trapping for small mammal species detection. However, considerably more effort and time was required when using Sherman traps compared to the MouseCams.

Mousecams in Future Assessments

We found that both trapping methods produced similar results for small mammal detection but MouseCams required significantly less time and labor for set-up and management. Also, MouseCams did not require containment or handling of animals. These results suggest that MouseCams are an effective technique to detect the presence of small terrestrial mammals when conducting biological surveys.

Appendix A. Components and design of a MouseCam.



Appendix B. Each target species captured by MouseCams: P. *leucopus* (top) and B. *brevicauda* (bottom).


-3 °C 27 °F 2022/01/28 22:34:33 0070
-1 °C 31 °F 01/27/2022 10:39:29 0073

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