

EFFECTS OF DIFFERENT BAITS, COMMERCIAL DOG FOOD AND COMMERCIAL SCENT LURE, ON ATTRACTING CARNIVORES TO REMOTE CAMERA TRAPS

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ABSTRACT

An increasing number of studies are attempting to assess ecological questions using noninvasive survey techniques such as remote camera trapping. However, camera trapping studies require intense human effort and are costly to maintain, pushing researchers to optimize detection of target species. We used 12 infrared cameras, six baited with commercial dog food and six with commercial scent lure. Food-baited cameras attracted more wildlife overall compared to control cameras, but not compared to scent-baited cameras. However, the composition of species that visited baited cameras changed. Raccoons were sighted more at both food-baited and scent-baited cameras, suggesting a preference for baited cameras. Domestic cats were sighted less at food and scent-baited cameras compared to control cameras. Other species surveyed (red fox, opossums, and striped skunk) did not significantly alter their behavior towards any bait. Food-baited cameras may be useful for ensuring all species that can be detected in an area are seen.

INTRODUCTION

Carnivores are integral members of a wildlife community and often drive key ecological processes. As a result, an increasing number of studies are attempting to assess key questions about the ecology of carnivore species. Traditional techniques to study carnivore ecology are typically invasive and potentially dangerous to the humans and animals involved. Thus, there has been a push to develop noninvasive survey techniques that can be deployed over large areas. Infrared-triggered remote camera traps are a potential solution that have been used in many studies surveying carnivores. However, camera traps require time and monetary investment to set up and require many nights of effort to accurately census a wildlife community. One way to reduce effort needed is to bait cameras to attract wildlife. Purchasing baits adds to the start up cost of the experiment, and thus selecting the most attractive bait for the species being studied is imperative.

With this study, I aim to assess the effectiveness of two different baits, commercial dog food and commercial scent lure, in attracting carnivores to camera traps. I expect:

1. Cameras with bait will attract more wildlife overall than cameras that are not baited.
2. Red foxes (*Vulpes vulpes*), raccoons (*Procyon lotor*), Virginia opossums (*Didelphis virginiana*), and domestic cats (*Felis catus*) will be more attracted to the commercial dog food. Many unowned domestic cats are fed by humans, and will be familiar with the smell of commercial pet food. Raccoons and opossums are a common nuisance to homeowners because they forage through their trash¹, and thus they will be familiar with dog food. Saunders and Harris² found foxes to be attracted to and consume baits enhanced with artificial beef flavor.
3. Striped skunks (*Mephitis mephitis*) will be more attracted to the commercial scent lure. The lure has a distinct skunky smell, which the skunks will find attractive.

STUDY AREA & METHODS

I placed 12 passive infrared cameras into 6 paired locations on a 16 hectare area on a trapping grid (Figure 1). One camera from each pair was baited with commercial dog food and the other camera with commercial scent lure. I treated each camera for two weeks, after which the cameras were moved a new random pair site, for a total of 18 sites.

I sorted photographs taken by the cameras into four categories: Carnivores, Other Animals, Unseen Animals, and Environmental Triggers. I calculated the number of animals “captured” per trap night per camera as:

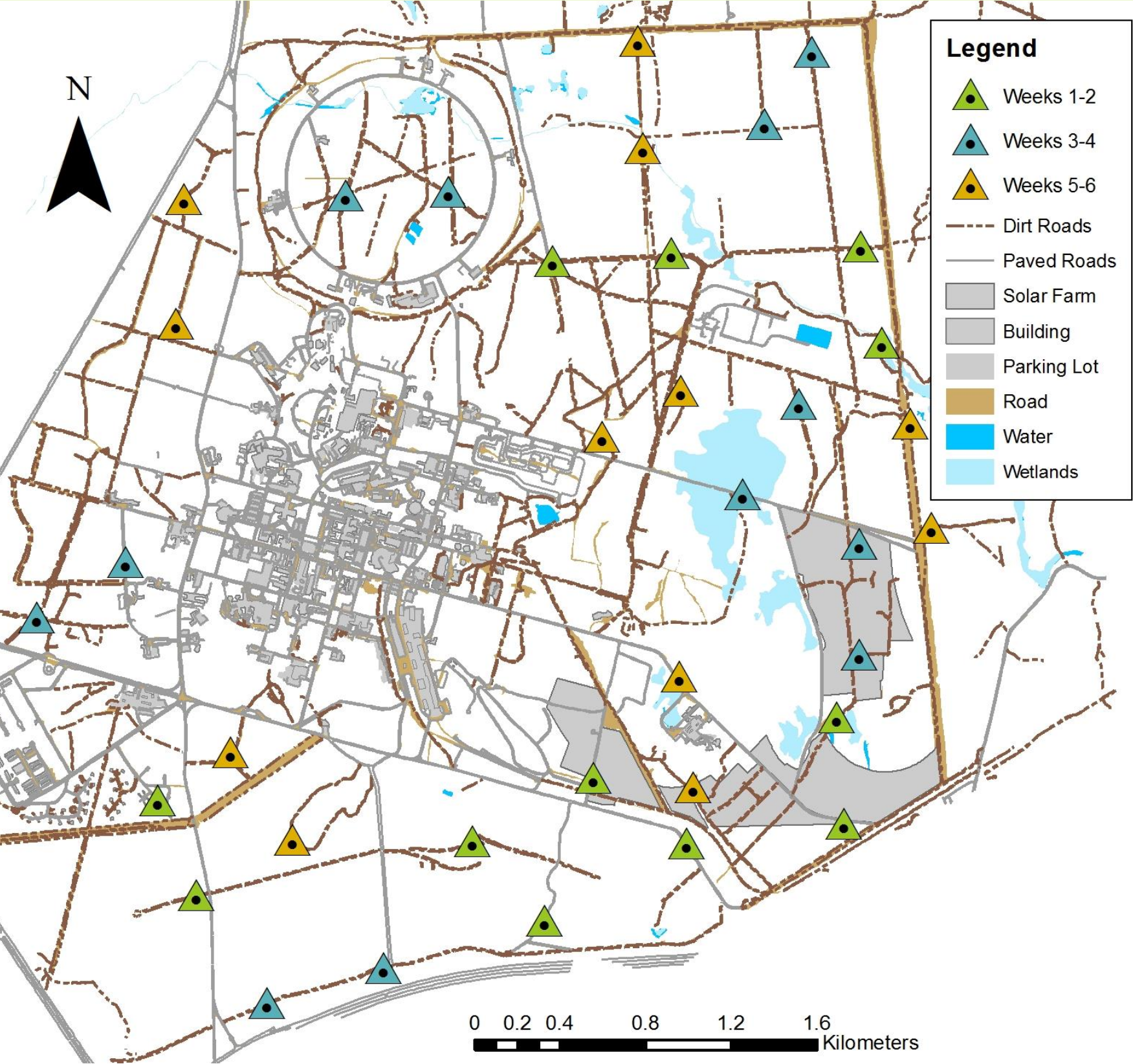
$$\text{Animals per Trap Night} = A/T$$

where A = the number of Carnivore and Other Animal photographs and T = the number of trap nights the camera was operational. The results were averaged across all cameras to present an average animals per trap night for each treatment. Success per species per two-week sampling period for each bait type was calculated as:

$$\text{Bait Success (\%)} = (C/A) * 100$$

where C = the number of photographs of carnivore species *i*. The results were averaged to present average proportions of carnivores captured for each treatment. I also used a chi-squared analysis to test if the distribution in proportions of carnivore species varied significantly among any of the treatments.

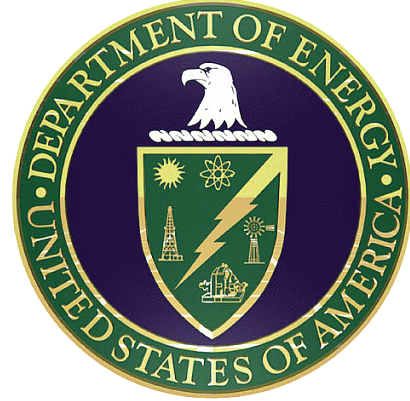
Figure 1. Map of 36 individual cameras in 18 paired locations. Triangles denote camera locations.



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RESULTS

Figure 2. The proportion of animal photographs containing carnivores, categorized by species. Animal Photographs includes pictures of carnivores, other animals, and unseen animals. Error bars represent 95% confidence intervals.

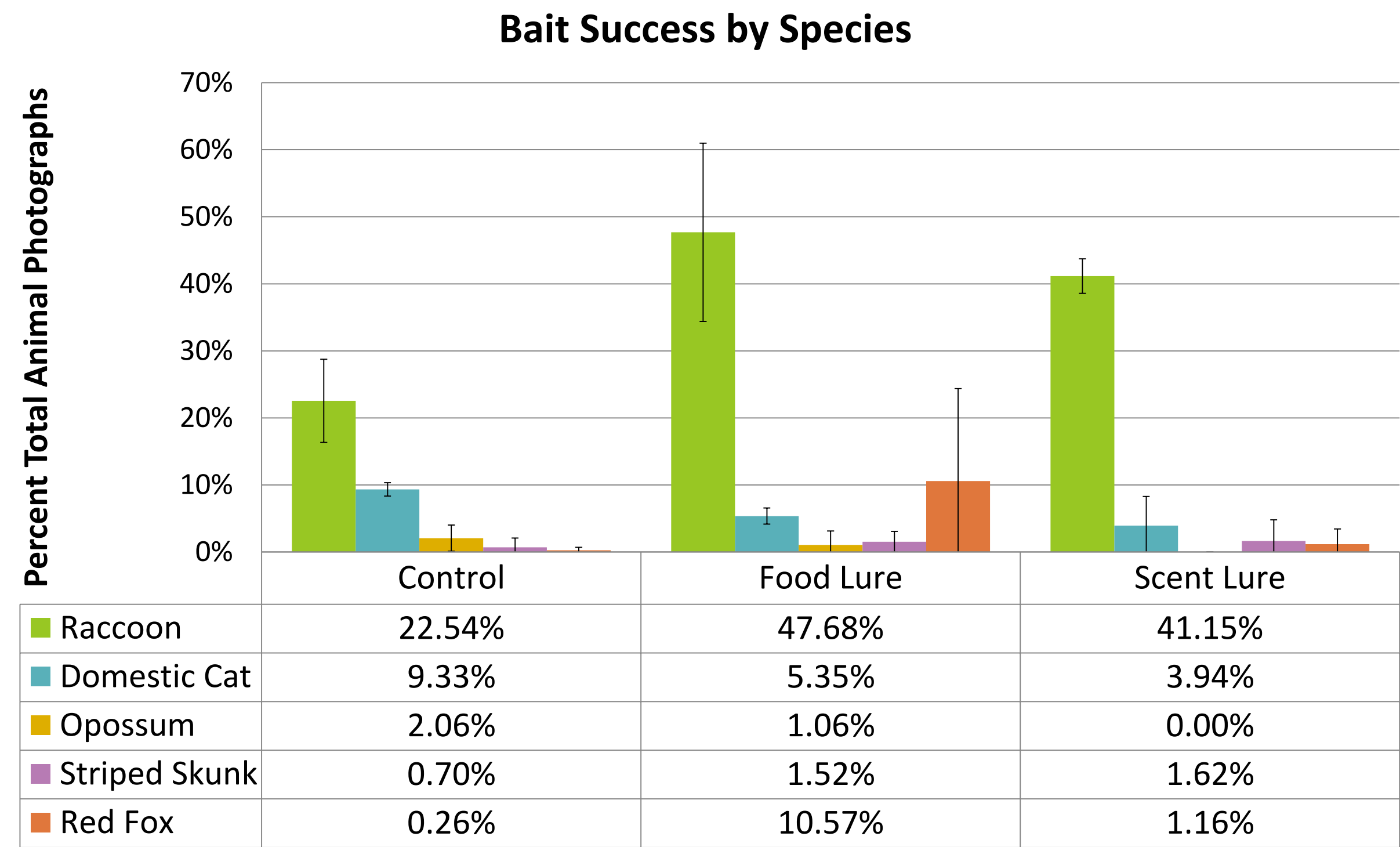
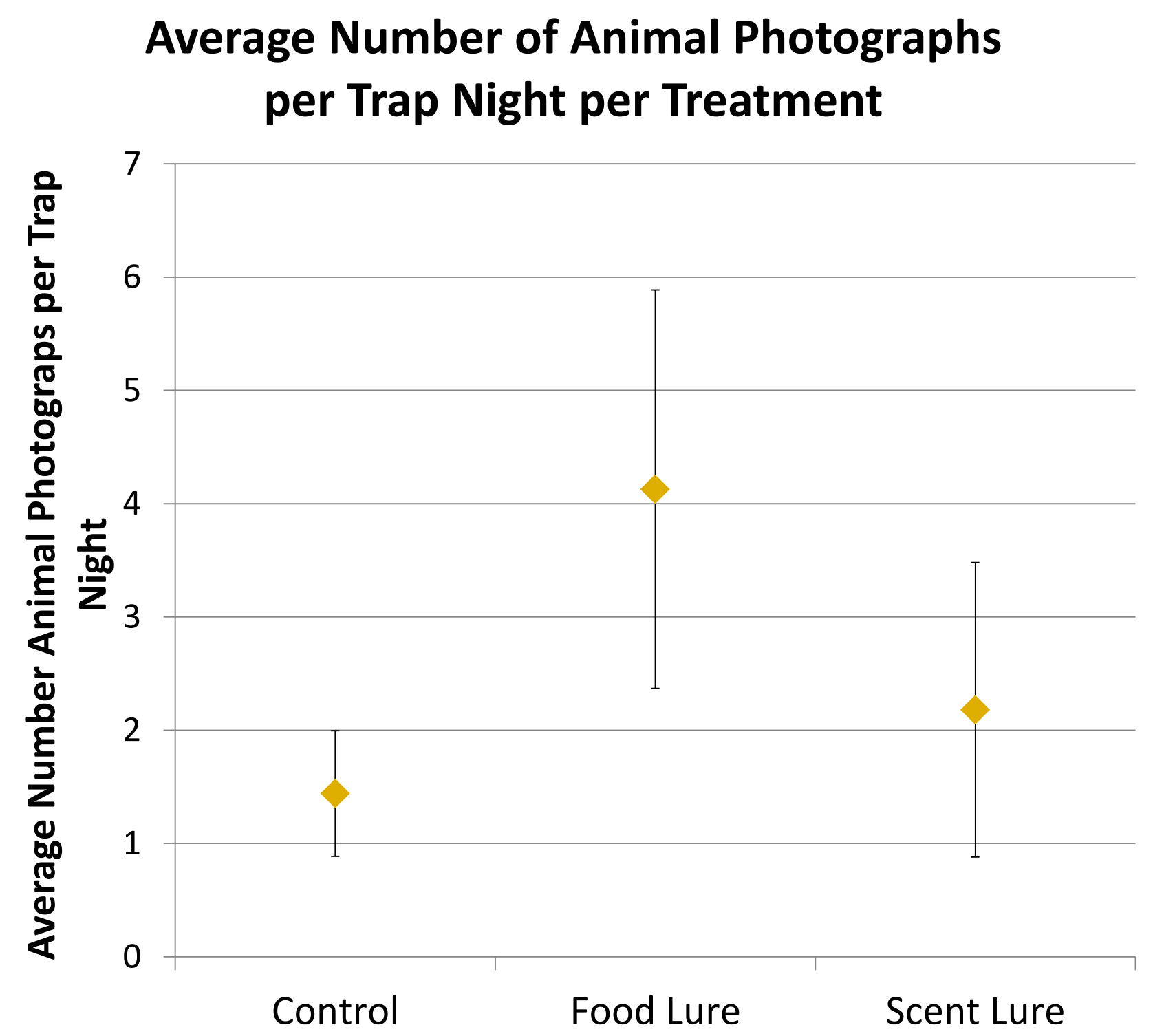


Table 2. The number of photographs taken and individuals captured by all cameras, categorized by treatment. The first column in each category gives the number of pictures taken and the second column gives the number of individuals captured. Within each category N = total number of photographs taken.

	Control	Food Lure	Scent Lure
	N=39,581	N=2,938	N=4,684
Carnivores	206	685	227
Raccoons	145	487	192
Domestic Cats	56	55	23
Opossum	14	12	0
Striped Skunk	3	15	7
Foxes	2	116	5
Other Animals ^a	405	349	240
Unseen Animals ^b	115	268	118
Environmental Triggers ^c	38,855	1,636	4,684

- a. “Other Animals” includes American robins, gray squirrels, ground hogs, killdeer, white-footed mice, white-tailed deer, and wild turkey.
b. “Unseen Animals” includes wildlife that trigger the motion sensor, but are not seen within the frame.
c. “Environmental Triggers” includes photographs of wind, snow, and shadows that do not include wildlife.

Figure 3. The average number of individuals captured by each camera categorized by treatment. Control cameras averaged 1.44 animals per trap night (95% CI = 0.89 to 2.00). Food lure cameras averaged 4.13 animals per trap night (95% CI = 2.37 to 5.89). Scent lure cameras averaged 2.18 animals per trap night (95% CI = 0.88 to 3.48).



DISCUSSION



Overall, food-baited cameras attracted more wildlife than control cameras, but not scent-baited cameras (Figure 3). However, the composition of wildlife species also changed significantly when the cameras were baited (Table 1). Raccoons were seen significantly more often at food and scent-baited cameras than control cameras (Figure 2). These results suggest raccoons are more attracted to cameras with bait, but do not prefer one bait over the other. Domestic cats were seen significantly less at food and scent-baited cameras compared to control cameras (Figure 2). Cats may be overrepresented on control cameras (due to their placement near a residential property). Opossums were seen significantly less at scent-baited cameras, though their sample sizes are potentially too low for accurate comparison. The large average of red foxes seen on food-baited is likely due to a single individual returning multiple times. Baited cameras, especially those baited with food-scent, may be useful for short-term inventorying surveys, where it can be used to ensure all species that can be detected are.

REFERENCES

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