Catchy title

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**Introduction**

Humans have trapped furbearing animals for millennia. While the motivations for trapping are varied, our predecessor’s trials and tribulations have distilled much wisdom and tradition to better beguile wildlife to step onto a leg-hold trap, be snagged in a snare, or stride into a cage. One suggested technique to bolster trap efficacy is to use lures or bait. The motivation for such techniques stems from the notion that lures or bait increase the chance a target species will investigate a trap by engaging the species sense of smell, sight, or hearing (as reviewed by Schlexer 2008).

We use trapping for wildlife research as well. More recently, non-invasive trapping techniques such as motion-triggered camera traps are becoming an increasingly useful way to survey the occupancy and abundance of wildlife. While such methods do not require an animal to be caught, it is still necessary for an animal to move in front of a camera in order to be photographed. As a result, lures are also being used in wildlife science. However, the reasoning behind the use of lures is mostly grounded in custom, rather than quantifiable effectiveness. It is important to quantify the effect of lures especially as they may have varying and opposite effects on target and non-target species. This is especially true, for example, if data are to be shared between surveys that do and do not use similar luring techniques or surveys that use varying lure types.

Of studies that do quantify the effects of lure, we discuss here why they may (at times) be inadequate. Compare the effects of lured / non-lured locations where the occupancy or abundance of an organism may be different. Lure may also influence the detectability of an organism in a variety of ways, which to date has not been addressed. For example, lure could increase the number of days a species is detected over a survey, could reduce the amount of time it takes to detect a species, or simply increase the amount of time an organism spends in front of a camera trap thereby increasing the number of photos.

Here, we set out to experimentally quantify the effect of lure on a suite of species throughout natural areas in Chicago, Illinois, USA. Our study design differs from others in that we experimentally place the lure at all sampling locations over a time period where we assume the occupancy status for a species is constant, thereby allowing us to quantify if lure increases the chances of detecting a species. We chose to use FAS as it has been suggested to be an effective attractant for a swath of carnivores (Schlexer 2008). We predicted that the use of lures would increase the detectability of mesocarnivores. Conversely, we predicted that prey species would have lower detection rates.

**Methods**

*Study area and site selection*

*Experimental design*

*Statistical analysis*

For the species with sufficient, we fit three separate occupancy models to the data, all of which varied in how the detection function estimates the probability of detecting a species given their presence. For all models, we assume that the occupancy status of a species does not change within a single season and that the probability of occupancy does not vary across sites. Thus, we model the probability of occupancy, *ψ*, at *i* in 1,…,*I* sites as the following Bernoulli process

Where *zi* is the occupancy status of a species, which takes the value of 1 if it is present and is otherwise 0. For simplicity, we explain these models for a single species, though they can easily be generalized to multiple species. Such a model is no different than the latent state of an intercept-only occupancy model, which we assume is adequate given the proximity and similarity between natural areas sampled in this study.

Following this latent-state model, there are a variety of ways to model the probability of detecting a species given their presence. our first model assumes that each day within a sampling week are repeat surveys in which a species may be detected, which is the most traditional formulation for occupancy models. This can modeled as a Binomial process for *k* in 1,…,4 weeks of sampling

Where *yi,k* are the number of days a species was detected at site *i* on week *k*, *ji,k*are the number of days sampled at site *i* on week *k*, and *pi,k* is the probability of detecting a species given their presence (i.e., *zi* = 1).

**Results**

Over 28 days of trapping, a total of X species were detected. Overall, enough data was collected to fit occupancy models to eight species: coyote, eastern chipmunk, eastern cottontail rabbit, eastern gray squirrel, fox squirrel, raccoon, Virginia opossum, and white-tailed deer. Eastern gray squirrel were detected the most over the survey, totaling X pictures across at Y of the 20 sampling sites. Coyote were detected the least, totaling X pictures at Y of the 20 sampling sites.

*Proportion of days detected*

*Time to first detection*

*Number of photographs taken*

**Discussion**