"Visitor Use and Activities Detected Using Trail Cameras at Forest Restoration Sites"
Janice L. Albers, Mark L. Wildhaber, Nicholas S. Green, Matthew A. Struckhoff and Michael J. Hooper
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Supplemental Materials

Trail Camera Method Details

We used Bushnell 119636C trail cameras (Bushnell 119636C, Vista Outdoor, Anoka, Minnesota) with the following settings: image size of three megapixels, three pictures per trigger, one second delay, sensor level on high, field scan every 15 minutes, passive infrared motion sensor on high sensitivity. Images were recorded at the lowest resolution to protect visitor privacy. The cameras were set to take pictures night and day when movement was detected to document parking lot activity. This model of camera included infrared flash to illuminate photographs during low light conditions. Additionally, images were taken every 15 minutes in case motion was not detected, such that the maximum time resolution for estimating visit duration was 15 minutes.

Because Bluffton had three cameras, some visitors were recorded by more than one camera in a single visit. We assumed that visitors would begin and end their visit via the same entrance because that was where they parked their vehicle. Thus, we only used the images from the first camera where a visitor was detected on each visit to count visitations and calculate visit duration. This resulted in an additional two, ten, and four visits removed at the Bluffton parking lot, driveway, and bridge stations, respectively.

Prior to deployment at Bluffton and Deetz, we conducted a pilot study using the same settings in a separate controlled parking lot where traffic was monitored independently of the camera. The camera was positioned 3.7 m off the ground with a view parallel to the movement

of traffic. After reviewing the control camera images, we determined that this combination of camera model and settings detected 96% ± 5.2 standard deviation (SD) of the vehicles entering or exiting at the U.S. Geological Survey (USGS) Columbia Environmental Research Center (4200 New Haven Road, Columbia, Missouri, 65201, USA) parking lot on weekdays (n = 17 days; traffic level = 40.6 ± 13.5 vehicles/d). For vehicles, we determined that using the previously mentioned camera settings, a distance of 15.2 m away from the vehicle was sufficient to blur the lettering so as to render visitor information unreadable. No on-site detection tests were performed; however, three separate monitoring teams used these parking lots dozens of times throughout the summer to conduct mammal, amphibian, and herbaceous sampling. All these visits were detected and photographed by the parking lot trail cameras. Because these were USGS employees working on the study, they were not considered part of the study and were removed from the analysis. Lastly, we determined that the best position of these cameras for photographing a hiker was 1.2 m off the ground, 3 m from the trail when positioned perpendicular to the trail, and although no detection accuracy of hikers was determined, we assumed the cameras accuracy at capturing hikers was consistent with previously reported visitor and large mammal accuracy (Carvalho et al. 2016, Harmsen et al. 2020, Lupp et al. 2021, Staab et al 2021).

Poisson Model Method Details

The expected number of activities or visitors observed in simulation i, Y_i, was modelled as a Poisson variable with expected value λ_i, with the expected value varying as a Michaelis-Menten (MM) function of sampling effort X_i:

$$Y_i \sim Poisson(\lambda_i)$$

$$log(\lambda_i) = \frac{\alpha X_i}{\beta + X_i}$$

In this model α is the asymptotic maximum number of activities observed and β is the level of sampling effort (days sampled) required to observe half of the predicted asymptote of observed activities ($Y = \alpha/2$). Under this model, the asymptote term implies that the observed number of activities or visitors will eventually level off as effort increases (Bolker 2009). It should be noted that the asymptote (α) does not measure the true activity level at a station, but rather the maximal activity level likely to be detected. It is reasonable to assume that the true number of activities or visitors was greater than, and correlated with, the estimated α (Green et al. 2020). Another useful property of the MM model here is that the level of effort required to observe $c/(c+1)$ of α (e.g., 3/4α or 4/5α) is equal to $c\beta$ (Bolker 2009). This means that the expected number of observed activities or visitors increases with sampling effort, and that the sampling effort to observe additional activities or visitors increases with the number of activities or visitors that have already been observed.

Table S1. Estimated parameter values for relationship reported in Figure 4 between the number of consecutive sampling days using a trail camera and the number of activities observed at the Bluffton Native Habitat Waterway, Bluffton, Indiana, and Deetz Nature Preserve in New Haven, Indiana, during the summer of 2016. Parameters were estimated using the Michaelis-Menten function, where α is the asymptote indicating the estimated maximum (max) number of observed activities and β indicates the level of effort (days) needed to obtain 50% of the maximum response. Std. Error=standard error, Deetz=Deetz Nature Preserve, Bluffton=Bluffton Native Habitat Waterway.

		Parameter	Estimate	Std. Error	t-value	p-value
Bluffton Bridge	Max activities	α	6.10	0.1503	40.6	<0.001
	Days to α/2	β	16.49	0.8866	18.6	<0.001
Bluffton Driveway	Max activities	α	6.18	0.1465	42.2	<0.001
	Days to α/2	β	39.53	2.1162	18.7	<0.001
Bluffton Parking Lot	Max activities	α	4.37	0.0606	72.1	<0.001
	Days to α/2	β	6.62	0.3476	19.0	<0.001
Deetz Parking Lot	Max activities	α	3.74	0.0194	193.1	<0.001
	Days to α/2	β	2.15	0.0100	21.5	<0.001

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