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Comparing Camera Survey Methods
for Monitoring Eastern Wild Turkey Populations

by

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Abstract

Conflicting estimates of the size and productivity of Eastern Wild Turkey (*Meleagris gallapavo silvestris*) populations led biologists in Alabama to seek repeatable, less-biased, survey methods. Previously, estimates of turkey populations were based on opportunistic surveys, expert opinion, or population reconstruction from uncorrected harvest data. I conducted 2 surveys to compare camera trapping methods on 3 study areas in Alabama: Barbour, Oakmulgee, and James D. Martin-Skyline Wildlife Management Areas in July–August during 2017 and 2018. My objectives were to: 1) compare estimates of detection and occupancy dynamics for turkey populations between camera surveys conducted on wildlife openings (WLO) versus randomly selected sites; and 2) investigate the effects of bait on estimates of detection and occupancy dynamics for turkey populations. I compared surveys on WLO greater than 0.2 ha (n = 90), and a stratified random sample of sites generated from a uniform 554 ha grid (n = 133). I surveyed each site for 5 days without bait and 5 days with bait. I developed encounter histories from 1,200,000 images and conducted dynamic occupancy analysis on 6 different turkey classes (all turkeys, adult males, adult females, total poults, Poult 2, and Poult 3). For every class of turkeys except Poult 3, the best model for detection included study area, bait presence, site type, and time of day. For Poult 3, the best detection model included only study area and time of day. The best model of occupancy dynamics also varied among classes of turkeys. For all turkeys and adult females, variation in occupancy was best explained by year, study area, and site type. For adult males, all poults, and Poult 3, variation in occupancy was best explained by study area, year, and bait. For Poult 2, study area and site type best explained variation in occupancy rates.

My results suggest that surveys conducted only at wildlife openings using bait may result in biased estimates of some classes of turkeys. These results will be used to make recommendations for the design of surveys to monitor turkey populations.

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Introduction

In the southeastern United States, the Eastern wild turkey (*Meleagris gallapavo silvestris;* hereafter, turkey) is an economically, ecologically, and culturally important game species (Grado et al. 1997, Isabelle et al. 2016). Turkeys are the second most commonly hunted species in Alabama after white-tailed deer (*Odocoileus virginianus*), with 43,769 turkey hunters purchasing licenses during the 2015-2016 season (Bryant 2016). Throughout the Southeast, multiple states have experienced turkey population declines in the past (Fleming et al. 1976, Campo et al. 1984, Palmer et al. 1993, Thogmartin and Johnson 1999). A recent, perceived decline in the Alabama turkey population has raised concerns from the Alabama Department of Conservation and Natural Resources (ADCNR) and led biologists to seek information on the current dynamics of the state's turkey population, and methods to monitor populations (Steve Barnett Pers. Comm.). A statewide monitoring program began in 2015 to gain information on turkey demographic rates and occupancy to help inform harvest decisions.

Survey design plays a vital role in obtaining reliable estimates for making strong inferences about the state of a population. Surveys can be as simple as convenience sampling, such as surveying along roads, trails or utility corridors or collecting data from areas where occupancy or density is known to be high (Anderson 2001). The data collected from convenience sampling is often used as an index of abundance and occupancy. Other forms of surveys are highly structured and standardized and require individual recognition during repeated counts (Williams et al. 2002, MacKenzie et al. 2006). Highly structured surveys have a greater strength of inference compared to their counterparts. Important components that must be considered when establishing a survey are the behaviors of the study species, an animal's geographic range, length and timing of survey, and the detectability of the species (Whitmer 2005, Nichols and Williams 2006, O'Connell 2011, Hamel et al. 2013). Designing a study with these factors in mind enables researchers to optimize inferences about the population and answer established research objectives.

Turkey surveys often use point counts conducted along roadsides (e.g., North American Breeding Bird Survey [NABBS]) to monitor population trends and estimate abundance, occupancy, and detection (Saurer et al. 2017). Roadside point counts are expected to relate linearly with abundance; however, they are susceptible to large sampling errors and are more appropriately used as indices of abundance rather than a direct measurement (Keller 1999, Toms 2006). Roadside point count accuracy depends upon the extent to which surveys from roadsides represent the entire region under study and whether counts can be adjusted for differences in detection among observers, species, and habitats. If counts are not repeated within years, bias due to imperfect detection cannot be estimated (Pollock 2002).

Imperfect detection occurs during point counts when the target species is not detected or is misclassified (Williams et al. 2002, MacKenzie et al. 2006). While there is an inherent assumption that detection probabilities are constant over space and time, in many cases this assumption is clearly invalid (Pollock et al. 2002). Therefore, detection probabilities and the factors that influence them must be incorporated into methods for estimating population state variables (e.g., occupancy or abundance) to adjust for bias (MacKenzie et al. 2002, MacKenzie 2006). Not accounting for this bias yields inaccurate estimates and incorrect inferences about state variables. Accurate estimates of state variables are required for predicting the consequences of different management actions that are important for the conservation of species (MacKenzie et al. 2006). For these reasons, the ADCNR lacks confidence in population estimates obtained by roadside point counts done by the NABBS and wildlife opening only camera surveys done by the ADCNR.

Over time, camera trapping has become one of the preferred tools for sampling wildlife populations. Increase in popularity is due to the increased efficiency and reliability of the equipment, and decreased cost of purchase and maintenance (O'Connell et al. 2011). Camera trapping offers a non-intrusive method for sampling wildlife (O'Connell et al. 2011), and can be used to monitor rare or cryptic species (Carbone et al. 2001, Jenelle et al. 2002, Linkie et al. 2013), study animal behavior (Carthew et al. 1991, Wallace et al. 2002), and provide a framework to estimate population parameters and detection probability (Weinstein et al. 1995, Pollock 2002, Williams et al. 2002). Camera trapping allows researchers to estimate and account for detection rates when estimating occupancy or abundance thereby increasing accuracy (Kéry and Schmid 2004). My research focused on the effects of survey design on estimates of occupancy and detection for camera surveys of wild turkey populations.

I compared a survey with camera traps placed at sites selected from a stratified random sample of locations (hereafter; randomly selected sites) to a survey with camera traps placed only in wildlife openings. Wildlife openings are generally easier to access and survey because they are usually along maintained roads, trails and planted in agronomic crops. By comparison randomly selected sites may contain dense vegetation and be located far from roads. Openings may also provide forage (e.g., insects) for young turkeys and serve as areas to find mates, forage, and avoid predators for adults (Sisson et al. 1991, Williams et al. 1997, Spears et al. 2007).

However, surveys conducted only at wildlife openings may be biased for several reasons. Turkeys may be more abundant or easily detected on wildlife openings compared to randomly selected sites, and openings may not be well distributed across the landscape. In contrast, surveys conducted at randomly selected sites may provide a more representative sample of occupancy across the landscape (Cusack et al. 2015). If turkeys prefer wildlife openings, they may use openings and the areas surrounding them more frequently leading to higher rates of detection and occupancy than randomly selected sites. Comparing the results of a survey conducted only at wildlife openings to a survey conducted at randomly selected sites will improve understanding of whether or not sampling restricted to wildlife openings results in biased estimates of turkey occupancy.

Bait is also often used to improve detection of a target species while camera trapping (Cobb et al. 1997, Koerth and Kroll 2000, Damm 2010, McCoy et al. 2011, Sorensen et al. 2014), but bait is another source of potential bias in camera surveys. While improving detection may improve the precision of surveys, bias that could result from responses to bait increases the potential for errors in management decisions. In addition to biasing occupancy estimates, bait presence may serve as a disease vector. Since bait concentrates turkeys, it enables the spread of multiple diseases such as aflatoxin poisoning (Quist 2000), avian pox, and avian tuberculosis (Friend and Franson 2001). Bait could also facilitate the spread of other wildlife diseases such as chronic wasting disease (Thompson et al. 2006, Sorensen et al. 2014) and swine brucellosis (Olsen 2010), causing health concerns for wildlife and humans (Dickson et al. 2001, Miller et al. 2013). Bait also can be expensive, difficult to deploy, and attract non-target species (e.g., wild pigs, *Sus scrofa*), ultimately increasing the cost associated with conducting a camera survey. Lastly, transporting bait to survey sites further complicates the logistics of getting to and from survey sites and increases the time associated with camera deployment. With these factors in mind, it is important to determine whether the use of bait is necessary or beneficial for conducting camera trapping surveys. Therefore, my research will also focus on the effects of bait on occupancy and detection estimates.

Given the lack of published research on the population dynamics of Eastern wild turkeys in the southeastern U.S. in the last decade, the uncertainty in current survey design, and the lack of understanding of the effects of bait presence on occupancy, occupancy dynamics and detection, this research aims to address the potential forms of bias associated with camera trapping for turkeys. Specifically, my objectives were to: 1) compare estimates of detection, occupancy and occupancy dynamics of turkey populations from camera trapping on wildlife openings versus randomly selected sites; and 2) investigate the effects of bait on estimates of detection, occupancy, and occupancy dynamics of turkey populations from camera trapping. This research will provide vital information for the design of long-term monitoring programs for turkey management.

Study Areas

I conducted this study on three Wildlife Management Areas (WMA) in Alabama. Barbour WMA (Barbour) was in southeastern Alabama in Barbour and Bullock counties, approximately 17 km from Clayton, Alabama. Barbour encompassed 11,417 ha, with most of the area consisting of longleaf (*Pinus palustris*) and loblolly pine (*P. taeda*) dominated uplands, with hardwood species along riparian zones. Frequent prescribed burning was used throughout the area to create and enhance habitat for wildlife dependent on early successional plant communities. The long-term forest management goal was to establish pine woodlands in the uplands, conversion of loblolly pine stands to longleaf pine where soils were appropriate, and to maintain hardwood stands on steep slopes and in drainages. Permanent wildlife openings (n = 210) were scattered throughout the area and were planted with both warm- (Cowpeas; *Vigna* *unguiculata*, Corn; *Zea mays*, Sunflower; *Helianthus* spp.) and cool- (Winter wheat; *Triticum aestivum*, Crimson clover; *Trifolium incarnatum*) season agronomic crops to provide year-round food and cover for turkey and other wildlife.

James D. Martin–Skyline WMA (Skyline) was in Jackson County, approximately 27 km north of Scottsboro in northeast Alabama. The WMA represented a cooperative partnership of landowners including Alabama Power Company, Alabama Department of Conservation and Natural Resources and The Nature Conservancy. The 24,577 ha area was composed of a variety of cover types but was predominately composed of oak (Chestnut oak; *Quercus montana*, Northern red oak; *Quercus rubra* and White oak; *Quercus alba*) forests, upland pine stands (*Pinus* spp.), fallow fields and agricultural fields predominately planted in corn. The area was actively managed for wild turkeys, with 285 wildlife openings, prescribed burning of uplands, timber thinning, native warm season grass (Big bluestem; *Andropogon gerardi*, Little bluestem; *Schizachyrium scoparium*, Indiangrass; *Sorghastrum nutans*) establishment, and creation of roadside bugging areas via disking and mowing. It is important to note that while Skyline has the most wildlife openings of all the study areas not all of these openings are routinely managed.

Oakmulgee WMA (Oakmulgee) was managed through a partnership between the ADCNR and the U.S. Forest Service. The WMA consisted of 18,211 ha in Bibb, Hale, Perry and Tuscaloosa Counties in west-central Alabama. The terrain was moderate to steep rolling hills. Longleaf pine stands dominated the upland ridges, with predominately oak–hickory (*Quercus* spp., *Carya* spp.) bottomlands. One-hundred wildlife openings were planted and maintained in a variety of warm season (e.g., Chufa; *Cyperus esculentus* and corn) and cool season forages (e.g., Red clover; *Trifolium partense* and Oats; *Avena sativa*).

Methods

I conducted two types of surveys for 7 weeks from 5 July to 28 August during 2017 and 2018. I conducted one camera survey using a stratified random sample of sites (randomly selected sites; *n* = 44, 44, 45 on Barbour, Skyline, and Oakmulgee, respectively), and conducted the other at randomly selected wildlife openings (WLO's) (*n* = 30 on each area). I used the same sites during both years to determine whether any changes in use occurred.

To determine my randomly selected sites I generated a 554 ha grid across Alabama, using ArcGISv10.6 (ESRI, Inc. Redmond, WA) and identified each cell center. Only cells with centers within the boundaries of my study areas were eligible for selection. I classified land cover composition of each grid cell into one of 36 categories based on the percentage of land cover in 4 broad categories (i.e., pine forest, hardwood forest, developed areas and agriculture) in 10 % increments from 0-100%. I then categorized each cell based on the relative abundance of all land cover types (e.g., 0-10% pine, 90%-100% hardwood). I selected at least one grid cell at random from each composition category present on each study area. I then, selected additional cells from each category in proportion to availability until a maximum of 45 sites were selected. I did this to ensure the diversity of cover types sampled reflected the diversity of the study area. To avoid bias from double-counting, when randomly selected sites were within 500 m of one another, I chose one at random for removal from the survey. The removal of proximate randomly selected sites led to a total of 133 randomly selected sites across all three study areas that I surveyed during each year.

Due to logistical constraints, I could only survey 30 WLOs each year on each study area. Thus, I chose 30 wildlife openings at random from all known wildlife openings to survey in 2017 and 2018. When openings were within 500 m of another opening, I chose one opening at random for use (Gonnerman 2017). This resulted in surveys on 90 wildlife openings across all three study areas each year.

For both surveys I used Reconyx PC85 (n = 13) and PC800 (n = 66) cameras (Reconyx, Inc., Holmen, WI). Cameras were programmed for a four-minute time-lapse image capture with images taken from 0600 to 2000 CST, approximately sunrise to sunset. I placed cameras on a suitable tree or post approximately 1.3 m above the ground, facing north or south, and parallel to the ground. I trimmed vegetation ≤10 m from the camera 1-3 cm high. I also removed low-hanging vegetation ≤3 m in front of the camera. At wildlife openings, I placed cameras on the edge of the opening or on a tree within the opening. At random sites, I placed cameras on trees at locations suitable for use by turkeys (2 track roads, agricultural field edges, edges near clear cuts, edges near openings/roads or wildlife openings) ≤300 m from the cell center. If no suitable site was available, the camera was placed in open forest cover, as near to the cell center as possible. The coordinates of the exact camera location were determined using Geographic Positioning System and recorded to ensure the same point was used in subsequent surveys.

I deployed cameras at wildlife openings and randomly selected survey sites to first monitor turkeys for 5 days in the absence of bait. These sites were revisited, cleared of new vegetation, and baited for 5 days prior to camera deployment, within my pre-baiting time period. Due to logistical constraints, no cameras were deployed during this 5-day pre-baited time period. At the end of the 5-day period, I replenished bait, re-cleared sites, and deployed cameras for 5 days (Table 1.1) for my baited time period. A pre-baited time period occurred before my baited time period to increase the probability of observing a turkey during my baited time period. I used approximately 9.5 L of cracked corn when bait was deployed and replenished. I placed two-thirds of this bait 2-3 m from the front of the camera in a 2-m by 1-m area and raked it into the ground to partially conceal it. The remaining bait was spread along several trails radiating from the camera for 10 m—20 m. If the selected site was a wildlife opening or trail, I spread bait along the edges to draw turkeys towards the camera.

I downloaded images from each camera weekly and analyzed them for the presence of turkeys. When turkeys were present, I recorded the number of turkeys in each sex and age class (male/female and adult/poult). Birds were classified based on physical characteristics (e.g. plumage, body size and beard/spur presence; Dickson 1992, Barnett and Barnett 2008). Poults were assigned to age classes: Poult 1, Poult 2 or Poult 3 according to size and coloration (Table 1.2). For each survey site, I developed an encounter history for each sex-age class to indicate the presence (1) or absence (0) of turkeys on each sampling occasion. In my analysis instead of using each image as a survey occasion (every 4 minutes), I used 1-hour time intervals between 0600 and 2000. These 1- hour time intervals were used to, reduce the number of sampling occasions and ensure that detection probabilities were estimable. Separate analyses were conducted for each turkey sex and age class: all turkeys (included any turkey despite sex and age), adult males, adult females, total poults (any poult regardless of age), Poult 2 and Poult 3. Additionally, any turkey that could not be classified into one of my groups was placed into the unknown category, although I did not analyze unknown turkeys as a separate group, I included them in the analysis of detection and use by all turkeys.

I defined detection as the probability of capturing turkeys in images assuming they used a survey site (MacKenzie et al. 2006) and developed a number of *a priori* hypotheses regarding detection rates; each hypothesis was then translated into a model (Table 1.3).

1. I hypothesized that detection would vary with time of day in a quartic relationship, with peak detection periods early and late in the day. I assumed that this effect would be constant across all study areas (Damm 2017, Gonnerman 2017).
2. I hypothesized that mean detection would vary by study area, site type, and in the presence of bait, in addition to the consistent quartic effect of time of day.
3. I hypothesized that detection would always be lower at every other site type compared to wildlife openings, but that this effect would vary with study area. While most other site types except forest were considered preferred, other site types may be disproportionately distributed across the landscape and may have decreased residence time. Turkeys may spend less time at these other site types because they may not provide enough food or cover, decreasing my probability of detecting them. I wanted to compare estimates of detection between different types of randomly selected sites to determine if there were consistently lower detection rates at every site type or only select ones.
4. I hypothesized detection of poults would increase as day of year increases, this effect would be constant across all study areas. As poults age, they become larger and darker in coloration becoming easier to differentiate from the vegetation on camera (Barnett and Barnett 2008, Table 1.2).
5. I hypothesized detection of adult males and females would not increase as day of year increases. Conversely to poults, adults do not change color or size and while their dietary needs would shift slightly, they would not shift enough to change detection (Yarrow and Yarrow 1999).

6. I hypothesized detection would be higher when bait is present, this effect would vary across study sites. Bait often serves an attractant in a variety of studies yielding higher opportunities to detect species (Damm 2010, McCoy et al. 2011, Sorensen et al. 2014, Gonnerman 2017) and can serve as a supplement where other sources of nutrition are lacking on the landscape.
7. Lastly, I hypothesized detection would always be lower at randomly selected sites compared to wildlife openings and this effect would vary across study areas. Wildlife openings are often used to supplement foods (e.g. insects, Barnett and Barnett 2008) essential to young turkeys. Wildlife openings also serve as areas to find mates and forage and avoid predators (Sisson et. al 1991, Wouldiams et al. 1997, Spears et al. 2007), potentially causing turkeys to frequent them more often when compared to other types of sites. Here I wanted to compare the effect of randomly selected sites as a whole.

I defined occupancy as the proportion of sample units that were visited by turkeys at some time during the survey period (MacKenzie et al. 2006), and developed a number of *a priori* hypotheses regarding occupancy; each hypothesis was then translated into a model (Table 1.4)

1. I hypothesized that turkey occupancy would not change in the presence of bait. Little research has been done to determine whether bait presence truly shifts the home ranges of turkeys; however, previous work done on bobwhite quail (*Colinus virginianus*) suggests birds may decrease their home range size in response to bait (Sisson et al. 2000, Haines et al. 2004).
2. I hypothesized occupancy would be lower at randomly selected sites compared to wildlife openings, this effect would be constant between study areas and years.

During the summer wildlife openings provide attractive sites for foraging and predator avoidance by turkeys (Yarrow and Yarrow 1999), randomly selected sites conversely may only provide a few or none of the necessities to turkeys during this time of year.

3. Finally, I hypothesized the occupancy of poults would increase as day of year increases. Successful first nests hatch from early May through early June and second nest attempts may hatch as late as August (Davis et al. 1995), causing an increase of poults throughout the duration of my survey.

Models of detection and use were built in Program MARK v9.0 (White and Burnham 1999) using the robust design occupancy estimation with estimates of psi (ψ), gamma (γ) and epsilon (ε). Detection covariates included day of year, study area, time of day, presence of bait, randomly selected site, and site type. Site type refers to the subset of categories within randomly selected sites; these could be two-track roads (n = 39), agricultural fields (n = 4), fire breaks (n = 8), edges near an opening/road (n = 31), forest (n = 26) and edges near clear cuts (n = 3). Wildlife openings could also be randomly selected (n = 22). Covariates used in occupancy models included day of year, study area and bait presence. I compared models using AIC corrected for small sample size (AICc, sample size = number of sites) and model probability (w) (Burnham and Anderson 2002). Before developing any detection or use model I created one null model ψ(g) ε(g) γ(g) p(g) of detection and occupancy. My null model states that occupancy and detection will always vary with study area. This is because my study areas differ in location and land cover composition, thus I assumed that turkey occupancy and abundance differ also. I first compared all detection (p) models for each sex and age class of turkey using the null occupancy model. I then compared occupancy models using the best detection model(s) to determine the overall best model for each sex and age class.

Post hoc analysis

During my analysis I found best fit models for all turkeys and adult female turkey classes in which probability of use was best explained by an additive relationship between study area and randomly selected sites. That is, the probability of use varies at every study area, yet, the effect of randomly selected sites was constant across study areas. To further test this relationship, I ran three additional models. The first model allowed randomly selected sites to have a constant effect between study areas and vary across years. The second model allowed the effect of randomly selected sites to vary across years and study areas, and the last model allowed the effect of randomly selected sites to vary across study areas but remain constant across years. I then ran two different models examining the relationship between bait, wildlife openings, and randomly selected sites, to examine how bait presence influenced estimates of occupancy at the survey sites. To do this I modeled two different relationships. In the first model bait had a constant effect across study areas, and in the second model the effect of bait varied across study areas.

I also found that bait was the factor most influencing my estimates of occupancy for adult male, total poults and Poult 3 age classes, and the effect of bait varied across study areas. To further examine this relationship, I also ran a model that kept the effect of bait constant across study areas.

I found the best fitting model for Poult 2 turkey occupancy suggested that probability of use was most influenced by a constant effect of day of year. To further examine this relationship, I ran a competing model that allowed the effect of day of year to vary across study areas. I also ran models to test the relationship of bait to Poult 2 occupancy.

Results

In 2017, I surveyed 90 wildlife openings and 133 randomly selected sites from 5 July to 28 August. I then surveyed the same 223 sites were again in 2018 from 4 July to 20 August. Over all surveys I collected and interpreted 1,136,097 time-lapse images. I detected turkeys in 11,925 images (1.05%). Among those images were turkeys were observed, adult females were the most frequently observed turkey class and were observed in 7,096 images (60%). Adult males were found in 4,131 images (34.6%). Poults were found the least often, appearing in 2,432 images (20%). Between the classes of poults, Poult 3 was observed the most (n = 2037, 17.1%), followed by Poult 2 (n = 270 images, 2.3%), and Poult 1 was observed in the fewest images 125 (1.05%). Due to the scarce number of encounters of Poult 1 (n = 10), I did not analyze them separately, although I did include them in the analysis of the total poult and all turkey analyses. Additionally, there were 955 images (8%) in my unknown category.

Detection

Selection of a detection model for all turkeys, adult males, adult females, total poults, and Poult 2 was unequivocal (w = 1) and showed that detection rates varied as a function of study area, bait presence, site type, and time of day (Tables 1.5, 1.6, 1.7, 1.8, 1.9, 1.10). Based upon my top model, for each of these classes the effect of bait and site types differed among study areas, and the effect of time of day was consistent among study areas. The best detection model for Poult 3 was also unequivocal (w = 1), but for this class, bait and site type were not included in the best model which indicated that detection rates were different among study areas with a consistent effect from time of day (Table 1.11).

Bait had the greatest effect on detection at Oakmulgee for my all turkey, adult male, and adult female classes. All turkeys were 5.53 (4.33 – 7.10; 95% C.L.) times as likely to be detected when bait was present. Adult males were 6.32 (3.83 – 10.41; 95% C.L.) times as likely to be detected when bait was present and adult females were 6.64 (4.57 – 9.70; 95% C.L.) times as likely to be detected when bait was present. Detection probability also increased in the presence of bait at Skyline for every turkey class with total turkeys being 2.94 (2.15 – 4.03; 95% C.L.) times as likely to be detected when bait was present, adult males being 4.20 (2.08 – 8.49; 95% C.L.) times as likely, adult females being 3.84 (2.41 – 6.12; 95% C.L.) times as likely. Bait presence at Skyline had the greatest effect on poults, with total poults being 9.25 (3.32 – 25.71; 95% C.L.) times as likely to be detected in the presence of bait and Poult 2 wild turkeys being 1.74E+14 (1.73E+14 – 1.74E+14; 95% C.L.) times as likely to be detected in the presence of bait. In contrast, detection decreased in the presence of bait at Barbour (Figures 1.1, 1.2, 1.3, 1.4, 1.5). Total turkeys were 0.73 (0.58 – 0.93; 95% C.L.) times as likely to be detected in the presence of bait, adult males were 0.55 (0.34 – 0.90; 95% C.L.) times as likely, adult females were 0.68 (0.47 – 1.0; 95% C.L.) times as likely, total poults were 0.57 (0.28 – 1.19; 95% C.L.) and Poult 2 turkeys were 0.85 (0.32 – 2.21; 95% C.L.) times as likely to be detected in the presence of bait.

The differences in detection among site type were variable among all turkeys, adult males, adult females, Poult, and Poult 2 classes (Figures 1.6, 1.7, 1.8, 1.9, 1.10). Total poults and Poult 2 turkeys demonstrated high detection probabilities on wildlife openings. Adult males and females and all turkeys were detected at a variety of site types. Adult males and all turkeys were predominately detected at wildlife openings, edges near openings/ roads and fire breaks. Detection for adult females were similar to adult males, predominately being detected at wildlife openings and edges near openings/ roads.

I also observed two distinct peaks in detection throughout the day at 0800 and 1600 across my study areas for all turkeys, adult males, adult females and total poults. (Figures 1.11, 1.12, 1.13, 1.14). Poult 3 demonstrated a slight shift in pattern of detectability with peaks at 0700 and 1500 and a slight peak at 1600 (Figure 1.15). Poult 2 also demonstrated a different pattern of detectability with peaks at 0600 and 1400 at all study areas (Figure 1.16).

Occupancy dynamics

The best model of occupancy dynamics differed among classes of turkeys (Table 1.12). The unequivocal best model (w = 1.0) for all turkeys (Table 1.13) and adult females (Table 1.14) indicated that use of sites in 2017 (Ψ), and changes in occupancy between years (ε and γ) were different among study areas and between all random sites and WLO, but the differences in use between random sites and WLO were constant (i.e., additive). For all turkeys and adult females, use of WLO was greater than random sites (Figures 1.17, 1.18). All turkeys were 2.67 (1.32 - 5.38; 95% C.L.) times as likely to use wildlife openings compared to randomly selected sites. Similarly, adult females were 4.96 (1.97 – 12.51; 95% C.L.) times as likely to use wildlife openings compared to randomly selected sites. The changes in site use between years varied but the patterns were similar for all turkeys and adult females. Use of random sites increased between 2017 and 2018 on all three areas, but use of WLO increased from 2017 to 2018 at Barbour and Oakmulgee, but declined at Skyline.

By comparison, the unequivocal best model (w = 1.0) of occupancy dynamics for adult males (Table 1.15), total poults (Table 1.16), and Poult 3 (Table 1.17) indicated that use of sites in 2017 (Ψ) was different among study area, did not vary between WLO and random sites, but changes in occupancy were affected by bait and the effect was different among areas. The changes in site use between years varied, but due to the interaction, the patterns were different between years for each class of turkey (Figures 1.19, 1.20, 1.21).

In contrast, the unequivocal best model (w = 1.0) of occupancy dynamics for Poult 2 (Table 1.18) indicated that use of sites in 2017 (Ψ) was different among study areas, and, changes in occupancy among sites and between years were related to date (DOY) and the effect was similar at each area (Figure 1.22).

Post hoc analysis

For both wild turkeys and adult females, I found the best fit model for the effect of randomly selected site was constant across years and study areas (Table 1.19, Table 1.20). I also found that for wild turkeys and adult females, the relationship among study area random sites and bait was complex and best described by a three-way interaction between study area, randomly selected sites and bait presence (Table 1.21, Table 1.22).

For adult males, and Poult 3, I found that the effect of bait on occupancy was constant across study areas (Table 1.23 and Table 1.24). For all poults, I found that the effect of bait varied among study areas (Table 1.25).

For Poult 2, I found equivocal support for the best fit model. The first model was my *a priori* model where the probability of use was influenced day of year with similar effects across study areas and a second model where the effect of day of year varied among study areas (ΔAICc

< 1). This suggests that the effect of day of year on Poult 2 occupancy may vary at each study area (Table 1.26). I also found that, similar to other sex-age classes of turkeys, the effect of bait varied across study areas (Table 1.27).

Discussion

Identifying and understanding the sources of variation in detection is important for reducing heterogeneity that could bias estimates of occupancy. All of my best detection models included a quadratic relationship between detection and time of day. In this relationship there were two distinct time periods when turkeys were most likely to be detected, one earlier in the day and the other in the afternoon. This pattern was similar to the findings of other researchers (Wunz 1990, Damm 2010, Gonnerman 2017), and has been observed in other avian species (Verbeek 1972, Burton and Hudson 1978, Hutto 1981). This pattern correlates with feeding and resting behavior during summer. Specifically, birds are likely to rest during the warmest period of the day and concentrate their foraging behavior earlier in the morning and later in the afternoon to minimize energy expenditure during the summer months (Verbeek 1972). Having two distinct time periods of increased detection may allow the number of photos collected to be reduced in future surveys and decrease the amount of time spent classifying images.

Bait presence, site type, and study area were also in the top models of all my turkey classes except for Poult 3. I found the relationship of bait to be inconsistent; that is, the presence of bait did not always increase turkey detection probabilities. These results are contradictory to the findings of Gonnerman (2017) who found as the number of days since bait was last replenished increased, the probability of detecting a turkey on camera increased. The difference between Gonnerman's findings and mine could have been caused by differences in forage availability across the landscape. For example, Skyline is the only study area that contains rugged plateau escarpments, and has fewer routinely managed wildlife openings; here food may be more limited or concentrated in certain areas, thus a readily available food source such as cracked corn would result in an increase in detection. Conversely, Barbour WMA has a mosaic of managed cover types as well as a number of openings; therefore, there may be a greater diversity of forage types available to turkeys making bait less attractive. Additionally, Barbour has more roads and thus greater access to wildlife openings, and this may contribute to lower detection rates on wildlife openings.

On average detection probabilities were lower on all other site types in comparison to wildlife openings and varied among study areas. Previous studies illustrated that adult females and broods spent the majority of their time foraging in openings (Blackburn et al. 1975, Hurst and Stringer 1975, Speake et al. 1975, Healy 1985); therefore, I expected higher detection probabilities on openings. I believed that other site types may not provide as much forage or may serve as travel corridors, which would ultimately decrease the frequency of use by turkeys. When I found other site types that had detection probabilities similar to wildlife openings, such as firebreaks and edges near openings/ roads, I believe this occurred because those sites provided better forage or vegetation structure compared to wildlife openings (Miller et al. 1999). Detection probabilities also varied according to study area. The cause of these differences is likely variation in land management practices, disturbance, land cover, and human activity levels, but is difficult to determine without further research (Gonnerman 2017).

Increasing the precision of monitoring programs for turkeys requires an understanding of the factors influencing turkey occupancy across the landscape. Not every sex and age class of turkey had the same best occupancy model. However, for all turkeys and adult females, probability of use was always lower at randomly selected sites than wildlife openings. Random sites were often located in forested areas that likely provided less forage than wildlife openings. Females frequently restrict their movements to areas of high food abundance, particularly when broods are young, and wildlife openings may provide more forage than random sites (Miller et al. 1997, Byrne et al. 2011). It is important to note that my all turkey class was composed predominately of adult females and therefore the results for all turkeys were most similar to adult females. If biologists have the objective of estimating the total occupancy in an area, my results suggest random placement of camera sites is necessary to avoid bias.

Conversely, in adult males, total poults, and Poult 3 turkeys, site type was not an important factor affecting occupancy, instead I found model support for bait presence to be the most important factor determining probability of use. These results were surprising as there is no published research showing bait presence influences estimates of occupancy for gallinaceous birds. Instead, my results suggest adult males, total poults, and Poult 3 wild turkeys may shift or increase their home range in response to bait presence. While no published research currently exists examining whether turkeys shift home ranges in response to bait, research on northern bobwhite suggests birds may decrease their home range size in response to bait (Sisson et al. 2000, Haines et al. 20004). It is important to note that while I found model support for bait presence influencing estimates of occupancy, I could not determine the magnitude or direction of this effect. Further research is needed to determine whether changes in home ranges actually occur and whether they are attributable bait presence. It is possible that factors I did not examine caused the changes in changes in occupancy that I observed. For example, I often deployed bait towards the end of July and August, and while day of year was not an important predictor of occupancy, it is possible that environmental factors such as soft mast availability affected my results. It is also plausible that adult males were more likely to respond to bait presence either by being forced out of areas containing more dominant males and inadvertently discovering bait (Buchholz 1997, Buchwalder and Huber-Eicher 2003, Buchwalder and Huber-Eicher 2005), or that males simply found bait during exploratory movements (Marable et al. 2012). Due to the inconsistent effects of bait across areas, it may be appropriate to use bait to monitor turkeys within a study area, but comparisons across multiple study areas may not be valid.

For a monitoring program to be useful, it should help discriminate among hypotheses about environmental and other variables that are manipulated in active conservation (Nichols and Williams 2006). My objectives were to determine the effect of randomly selected sites on estimates of occupancy dynamics and detection; and to determine the effect of bait presence on occupancy dynamics and detection across turkey sex and age classes. Understanding these effects is critical for the proper design of surveys that would provide useful inference about the turkey population. Other factors such as mast availability, disturbance, and misidentification of turkeys in photos should be investigated as additional sources of heterogeneity that influence estimate of occupancy and detection.

My analysis demonstrates that, if managers are interested in monitoring the female segment of the population, a random sample of survey sites is needed to obtain unbiased estimates of occupancy and abundance. Biologists also need to incorporate randomly selected sites into their survey design if they are interested in surveying adult males or Poult 3 turkeys. However, it becomes more complicated when using bait. My models showed bait presence influenced our estimates of occupancy for some classes of turkeys. While it may be necessary to use bait within a study area to conduct a survey, it may not be appropriate to make inferences across multiple study areas due to the variable effects of bait presence. The use of bait may also result in overestimates of occupancy for adult males and Poult 3; therefore, the effect of bait presence on other classes of turkeys should be explored further (Margadant 2019).

Recommendations

Camera surveys are an effective way of gathering information about turkey populations at a moderate cost compared to mark-recapture surveys. However, survey methods require careful consideration. Using camera trap surveys, biologists can obtain estimates of occupancy, detection, productivity, and abundance, which can provide useful information on population trend, state and size to inform management and aid in future management decisions; however, improper survey design may provide misleading results.

Further investigation of factors affecting imperfect detection can help guide future surveys and improve survey design (MacKenzie et al. 2002). Detection rates for studies using time-lapse cameras can restrict image collection to periods of high turkey activity, thereby increasing detection rates, which will decrease the number of images collected, and the amount of time spent interpreting them. Surveys conducted only on wildlife openings and surveys using bait require careful interpretation because both factors introduce heterogeneity in occupancy and detection. Additional research is necessary to examine the extent of the effects of bait on detection probabilities and occupancy dynamics.

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Table 1.1 Weekly schedule for treatments at camera trapping sites at randomly selected sites and wildlife openings on study areas in Alabama in 2017 and 2018. Up to 25 camera traps were deployed each week at each site. Light green indicates periods when unbaited surveys were conducted. Blue indicates pre-bait periods when bait was deployed but surveys were not conducted. Dark Green indicates bait periods when baited surveys were conducted.

Camera Site		**Dates**					
		5-11 July	**12-18 July**	**19-25 July**	**26 July - 1 August**	**2-8 August**	**9-15 August**
Wildlife Openings	Sites 1-10						
	Sites 11-20						
	Sites 21-30						
Random Site	Sites 1-15						
	Sites 16-30						
	Sites 31-45						

Table 1.2. Eastern wild turkey (*Meleagris gallapavo silvestris*) poult classification based off days of age, height and physical characteristics in Alabama.

Poult Class	Days of Age	Height (cm)	Characteristics
Poult 1	≤ 7	≤15.24	2 white wing bars & a downy appearance
Poult 2	8-35	24.13	Wing bars appear with juvenile plumage starting to come in
Poult 3	36-56	36.83	Emergence of black primary feathers with white wing barring

Table 1.3. Models used to compare the detection (p) of wild turkeys by sex and age using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) camera trap surveys in Alabama, summer 2017 and 2018.

[1]Model
ψ(g) ε(g) γ(g) p(g)
ψ(g) ε(g) γ(g) p(g*R)
ψ(g) ε(g) γ(g) p(g+DOY)
ψ(g) ε(g) γ(g) p(g+TOD4)
ψ(g) ε(g) γ(g) p(g*ST)
ψ(g) ε(g) γ(g) p(g*bait)
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)

[1] g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.4. Models used to compare occupancy (ψ), local extinction (ε), and colonization (γ) while accounting for imperfect detection (p) of wild turkeys by sex and age class using camera trap surveys in Alabama, summer 2017 and 2018.[2]

[2]Model
ψ(g+R) ε(g+R) γ(g+R) *p*(g)
ψ(g+R) ε(g+R) γ(g+R) *p*(g*R)
ψ(g+R) ε(g+R) γ(g+R) *p*(g+DOY)
ψ(g+R) ε(g+R) γ(g+R) *p*(g+TOD4)
ψ(g+R) ε(g+R) γ(g+R) *p*(g*ST)
ψ(g+R) ε(g+R) γ(g+R) *p*(g*bait)
ψ(g+R) ε(g+R) γ(g+R) *p*(g*bait*ST+TOD4)
ψ(g) ε(g*bait) γ(g*bait) *p*(g)
ψ(g) ε(g*bait) γ(g*bait) *p*(g*R)
ψ(g) ε(g*bait) γ(g*bait) *p*(g+DOY)
ψ(g) ε(g*bait) γ(g*bait) *p*(g+TOD4)
ψ(g) ε(g*bait) γ(g*bait) *p*(g*ST)
ψ(g) ε(g*bait) γ(g*bait) *p*(g*bait)
ψ(g) ε(g*bait) γ(g*bait) *p*(g*bait*ST+TOD4)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g*R)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g+DOY)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g+TOD4)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g*ST)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g*bait)
ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g*bait*ST+TOD4)
ψ(g) ε(g) γ(g) p(g)

[2] g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.5. Best models (Δ<2.0) of detection for each turkey sex and age class at camera trapping sites in Alabama 2017 and 2018. Best models are indicated by X.

[3]**Model**	**TT**	**Male**	**Female**	**Poult**	**Poult 2**	**Poult 3**
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	**X**	**X**	**X**	**X**	**X**	
ψ(g) ε(g) γ(g) p(g+TOD4)						**X**
ψ(g) ε(g) γ(g) p(g*bait)						
ψ(g) ε(g) γ(g) p(g*R)						
ψ(g) ε(g) γ(g) p(g*ST)						
ψ(g) ε(g) γ(g) p(g+DOY)						
ψ(g) ε(g) γ(g) p(g)						

[3] g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.6. Comparison of models for estimating detection rates (*p*) using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) for all turkeys using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (*w*), model likelihood (Lik), number of parameters (*K*) and deviance (Dev) are shown.

[4]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g) ε(g) γ(g) *p*(g*bait*ST+TOD4)	11208.24	0	1	1	31	11143.93
ψ(g) ε(g) γ(g) *p*(g+TOD4)	11723.89	515.65	0	0	16	11691.27
ψ(g) ε(g) γ(g) *p*(g*bait)	11920.39	712.15	0	0	15	11889.84
ψ(g) ε(g) γ(g) *p*(g*R)	12130.25	922.01	0	0	15	12099.70
ψ(g) ε(g) γ(g) *p*(g*ST)	12197.60	989.36	0	0	24	12148.21
ψ(g) ε(g) γ(g) *p*(g+DOY)	12344.49	1136.25	0	0	13	12318.08
ψ(g) ε(g) γ(g) *p*(g)	12346.84	1138.60	0	0	12	12322.49

[4]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.7. Comparison of models for estimating detection (p) rates using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) for adult male wild turkeys using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K) and deviance (Dev) are shown.

[5]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	4489.97	0	1	1	31	4425.66
ψ(g) ε(g) γ(g) p(g+TOD4)	4697.70	207.73	0	0	16	4665.08
ψ(g) ε(g) γ(g) p(g*bait)	4776.42	286.45	0	0	15	4745.87
ψ(g) ε(g) γ(g) p(g*ST)	4851.54	361.57	0	0	24	4802.16
ψ(g) ε(g) γ(g) p(g*R)	4862.56	372.59	0	0	15	4832.01
ψ(g) ε(g) γ(g) p(g)	4930.33	440.35	0	0	12	4905.97
ψ(g) ε(g) γ(g) p(g+DOY)	4930.69	440.72	0	0	13	4904.27

[5]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.8. Comparison of models for estimating detection (p) rates using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) for adult female wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K) and deviance (Dev) are shown.

[6]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	7319.10	0	1	1	31	7254.79
ψ(g) ε(g) γ(g) p(g+TOD4)	7623.68	304.58	0	0	16	7591.05
ψ(g) ε(g) γ(g) p(g*bait)	7718.20	399.10	0	0	15	7687.65
ψ(g) ε(g) γ(g) p(g*R)	7894.37	575.27	0	0	15	7863.82
ψ(g) ε(g) γ(g) p(g*ST)	7933.83	614.73	0	0	24	7884.44
ψ(g) ε(g) γ(g) p(g+DOY)	7992.05	672.96	0	0	13	7965.64
ψ(g) ε(g) γ(g) p(g)	7994.23	675.14	0	0	12	7969.88

[6] g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.9. Comparison of models for estimating detection rates (*p*) using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) for total poults, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (*w*), model likelihood (Lik), number of parameters (*K*) and deviance (Dev) are shown.

[7]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g) ε(g) γ(g) *p*(g*bait*ST+TOD4)	2046.24	0	1	1	31	1981.93
ψ(g) ε(g) γ(g) *p*(g+TOD4)	2117.35	71.11	0	0	16	2084.73
ψ(g) ε(g) γ(g) *p*(g*bait)	2158.11	111.87	0	0	15	2127.56
ψ(g) ε(g) γ(g) *p*(g*R)	2201.79	155.56	0	0	24	2152.41
ψ(g) ε(g) γ(g) *p*(g*ST)	2202.34	156.10	0	0	15	2171.79
ψ(g) ε(g) γ(g) *p*(g)	2214.12	167.88	0	0	12	2189.77
ψ(g) ε(g) γ(g) *p*(g+DOY)	2215.81	169.58	0	0	13	2189.40

[7]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.10. Comparison of models for estimating detection rates (p) using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) for Poult 2 wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K) and deviance (Dev) are shown.

[8]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	841.93	0	0.98	1	31	777.62
ψ(g) ε(g) γ(g) p(g*bait)	849.51	7.58	0.02	0.02	15	818.96
ψ(g) ε(g) γ(g) p(g+TOD4)	861.50	19.57	0	0	16	828.88
ψ(g) ε(g) γ(g) p(g*R)	867.90	25.97	0	0	15	837.36
ψ(g) ε(g) γ(g) p(g)	882.15	40.22	0	0	12	857.79
ψ(g) ε(g) γ(g) p(g+DOY)	882.34	40.41	0	0	13	855.93
ψ(g) ε(g) γ(g) p(g*ST)	885.17	43.23	0	0	24	835.78

[8]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.11. Comparison of models for estimating detection (p) using a null model of occupancy (ψ), local extinction (ε), and colonization (γ) rates for Poult 3 wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K) and deviance (Dev) are shown.

[9]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g) γ(g) p(g+TOD4)	1331.47	0	1	1	16	1298.85
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	1347.29	15.82	0	0	31	1282.98
ψ(g) ε(g) γ(g) p(g*bait)	1386.39	54.92	0	0	24	1337.01
ψ(g) ε(g) γ(g) p(g*ST)	1388.16	56.69	0	0	15	1357.61
ψ(g) ε(g) γ(g) p(g*R)	1397.67	66.19	0	0	15	1367.12
ψ(g) ε(g) γ(g) p(g)	1398.67	67.20	0	0	12	1374.32
ψ(g) ε(g) γ(g) p(g+DOY)	1400.56	69.08	0	0	13	1374.14

[9]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.12. Best models (Δ<2.0) of occupancy dynamics and detection for each turkey sex and age class at camera trapping sites in Alabama 2017 and 2018. Best models are indicated by X. Comparison of occupancy models across turkey sex an age classes.

[10]**Model**	**TT**	**Male**	**Female**	**Total Poult**	**Poult 2**	**Poult 3**
• ψ(g+R) ε(g+R) γ(g+R) *p*(g*bait*ST+TOD4)	**X**		**X**			
• ψ(g+R) ε(g+R) γ(g+R) *p*(g+TOD4)						
• ψ(g) ε(g*bait) γ(g*bait) *p*(g*bait*ST+TOD4)		**X**		**X**		**X**
• ψ(g) ε(g*bait) γ(g*bait) *p*(g+TOD4)						
• ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g*bait*ST+TOD4)					**X**	
• ψ(g+DOY) ε(g+DOY) γ(g+DOY) *p*(g+TOD4)						
• ψ(g) ε(g) γ(g) *p*(g*bait*ST+TOD4)						
• ψ(g) ε(g) γ(g) *p*(g+TOD4)						

[10]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.13. Comparison of occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for all turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K) and deviance (Dev) are shown.

[11]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g+R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	11174.06	0	1	1	34	11103.28
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	11208.24	34.18	0	0	31	11143.93
ψ(g+DOY) ε(g+DOY) γ(g+DOY) p(g*bait*ST+TOD4)	11209.38	35.32	0	0	34	11138.60
ψ(g) ε(g*bait) γ(g*bait) p(g*bait*ST+TOD4)	11216.41	42.35	0	0	37	11139.11

[11] g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.14. Comparison of occupancy (*ψ*), local extinction (*ε*), and colonization (*γ*) and detection (*p*) models for adult female wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (*w*), model likelihood (Lik), number of parameters (*K*), and deviance (Dev) are shown.

[12]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g+R) *ε*(g+R) *γ*(g+R) *p*(g*bait*ST+TOD4)	7287.39	0	1	1	34	7216.61
ψ(g) *ε*(g*bait) *γ*(g*bait) *p*(g*bait*ST+TOD4)	7307.63	20.24	0	0	37	7230.34
ψ(g+DOY) *ε*(g+DOY) *γ*(g+DOY) *p*(g*bait*ST+TOD4)	7315.61	28.22	0	0	34	7244.83
ψ(g) *ε*(g) *γ*(g) *p*(g*bait*ST+TOD4)	7319.10	31.70	0	0	31	7254.79

[12]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.15. Comparison of occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for adult male wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[13]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g*bait) ε(g*bait) γ(g*bait) p(g*bait*ST+TOD4)	4485.77	0	1	1	37	4414.98
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	4636.47	144.19	0	0	31	4572.16
ψ(g+R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	4650.69	158.40	0	0	34	4579.90
ψ(g+DOY) ε(g+DOY) γ(g+DOY) p(g*bait*ST+TOD4)	4650.99	158.71	0	0	34	4580.21

[13]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.16. Comparison of occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for total poults, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (*w*), model likelihood (Lik), number of parameters (*K*), and deviance (Dev) are shown.

[14]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g) ε(g*bait) γ(g*bait) p(g*bait*ST+TOD4)	2063.09	0	0.46	1	37	1985.79
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	2063.59	0.50	0.35	0.78	31	1999.28
ψ(g+R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	2065.33	2.25	0.15	0.33	34	1994.55
ψ(g+DOY) ε(g+DOY) γ(g+DOY) p(g*bait*ST+TOD4)	2067.85	4.76	0.04	0.09	34	1997.07

[14] g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.17. Comparison of occupancy (*ψ*), local extinction (*ε*), and colonization (*γ*) and detection (*p*) models for wild turkey Poult 3, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (*w*), model likelihood (Lik),number of parameters (*K*), and deviance (Dev) are shown.

[15]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g) *ε*(g*bait) *γ*(g*bait) *p*(g+TOD4)	1324.15	0	0.90	1	22	1278.99
ψ(g) *ε*(g) *γ*(g) *p*(g+TOD4)	1329.42	5.27	0.06	0.07	19	1290.55
ψ(g+DOY) *ε*(g+DOY) *γ*(g+DOY) *p*(g+TOD4)	1331.47	7.32	0.02	0.03	16	1298.85
ψ(g+R) *ε*(g+R) *γ*(g+R) *p*(g+TOD4)	1333.34	9.19	0.01	0.01	19	1294.47

[15]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.18. Comparison of occupancy (*ψ*), local extinction (*ε*), and colonization (*γ*) and detection (*p*) models for Poult 2 wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (*w*), model likelihood (Lik), number of parameters (*K*) and deviance (Dev) are shown.

[16]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g+DOY) *ε*(g+DOY) *γ*(g+DOY) *p*(g*bait*ST+TOD4)	836.57	0	0.80	1	34	765.79
ψ(g+R) *ε*(g+R) *γ*(g+R) *p*(g*bait*ST+TOD4)	839.33	2.76	0.20	0.25	34	768.55
ψ(g) *ε*(g) *γ*(g) *p*(g*bait*ST+TOD4)	854.34	17.77	0	0	31	790.03
ψ(g) *ε*(g*bait) *γ*(g*bait) *p*(g*bait*ST+TOD4)	858.42	21.85	0	0	37	781.12

[16]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.19. *Post hoc* comparison of randomly selected site effect on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for all turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[17]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g+R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	11174.06	0	0.85	1	34	11103.28
ψ(g*R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	11177.98	3.92	0.12	0.14	36	11102.86
ψ(g+R) ε(g*R) γ(g*R) p(g*bait*ST+TOD4)	11180.51	6.45	0.03	0.04	38	11101.03
ψ(g*R) ε(g*R) γ(g*R) p(g*bait*ST+TOD4)	11203.29	29.23	0	0	40	11119.43
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	11208.24	34.18	0	0	31	11143.93

[17]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.20. *Post hoc* comparison of randomly selected sites on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for adult female wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik),number of parameters (K), and deviance (Dev) are shown.

[18]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g+R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	7287.39	0	0.86	1	34	7216.61
ψ(g*R) ε(g+R) γ(g+R) p(g*bait*ST+TOD4)	7291.04	3.64	0.14	0.16	36	7215.92
ψ(g+R) ε(g*R) γ(g*R) p(g*bait*ST+TOD4)	7300.61	13.21	0	0	38	7221.13
ψ(g*R) ε(g*R) γ(g*R) p(g*bait*ST+TOD4)	7310.75	23.35	0	0	40	7226.89
ψ(g) ε(g) γ(g) p(g*bait*ST+TOD4)	7322.10	34.70	0	0	31	7257.79

[18]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.21. *Post hoc* comparison of the effect of bait on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for all turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik),number of parameters (K), and deviance (Dev) are shown.

[19]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g+R) ε(g*R*bait) γ(g*R*bait) p(g*bait*ST+TOD4)	11154.03	0	0.88	1	44	11061.35
ψ(g+R) ε(g*R*bait) γ(g*R*bait) p(g*bait*ST+TOD4)	11158.06	4.03	0.12	0.13	40	11074.20
ψ(g+R) ε(g*R) γ(g*R) p(g*bait*ST+TOD4)	11176.33	22.29	0	0	38	11096.85

[19]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.22. *Post hoc* comparison of the effect of bait on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for adult female wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik),number of parameters (K), and deviance (Dev) are shown.

[20]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g*R) ε(g+R*bait) γ(g+R*bait) p(g*bait*ST+TOD4)	7279.94	0	0.97	1	42	7191.68
ψ(g*R) ε(g+R+bait) γ(g+R+bait) p(g*bait*ST+TOD4)	7287	7.06	0.03	0.03	38	7207.52
ψ(g+R) ε(g*R) γ(g*R) p(g*bait*ST+TOD4)	7291.04	11.10	0	0	36	7215.92

[20]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.23. *Post hoc* comparison of the effect of bait on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for adult male wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[21]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g+bait) γ(g+bait) p(g*bait*ST+TOD4)	4632.64	0	0.96	1	33	4564.02
ψ(g) ε(g*bait) γ(g*bait) p(g*bait*ST+TOD4)	4638.82	6.17	0.04	0.05	37	4561.52

[21]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.24. *Post hoc* comparison of the effect of bait on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for Poult 3 wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[22]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g+bait) γ(g+bait) p(g+TOD4)	1317.84	0	0.96	1	18	1281.06
ψ(g) ε(g*bait) γ(g*bait) p(g+TOD4)	1324.15	6.31	0.04	0.04	22	1278.99

[22]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.25. *Post hoc* comparison of the effect of bait on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for total poults, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[23]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g) ε(g*bait) γ(g*bait) *p*(g*bait*ST+TOD4)	2063.09	0	1	1	37	1985.79
ψ(g) ε(g+bait) γ(g+bait) *p*(g*bait*ST+TOD4)	2106.97	43.88	0	0	33	2038.35

[23]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.26. *Post hoc* comparison of the effect of day of year on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for Poult 2 wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[24]Model	AICc	ΔAICc	w	Lik	K	Dev
ψ(g) ε(g+DOY) γ(g+DOY) p(g*bait*ST+TOD4)	836.57	0	0.62	1	34	765.79
ψ(g) ε(g*DOY) γ(g*DOY) p(g*bait*ST+TOD4)	837.55	0.98	0.38	0.61	38	758.07

[24]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Table 1.27. *Post hoc* comparison of the effect of bait on occupancy (ψ), local extinction (ε), and colonization (γ) and detection (p) models for Poult 2 wild turkeys, using camera trap surveys in Alabama, summer 2017 and 2018. For each model, values AICc, relative difference in AICc (ΔAICc), model probability (w), model likelihood (Lik), number of parameters (K), and deviance (Dev) are shown.

[25]Model	AICc	ΔAICc	w	Lik	*K*	Dev
ψ(g+DOY) ε(g+DOY*bait) γ(g+DOY*bait) p(g*bait*ST+TOD4)	833.41	0	0.83	1	40	749.55
ψ(g+DOY) ε(g+DOY) γ(g+DOY) p(g*bait*ST+TOD4)	836.57	3.16	0.17	0.21	34	765.79
ψ(g+DOY) ε(g+DOY+bait) γ(g+DOY+bait) p(g*bait*ST+TOD4)	844.59	11.18	0	0	36	769.47

[25]g- study area on which the survey took place. R- randomly selected site. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST- a subset of the randomly selected sites; these included: ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6 – forests. ST7- wildlife openings. bait- bait was present during the time of the survey.

Figure 1.1. Probability of detection during no bait and baited camera surveys on each study area, for all turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

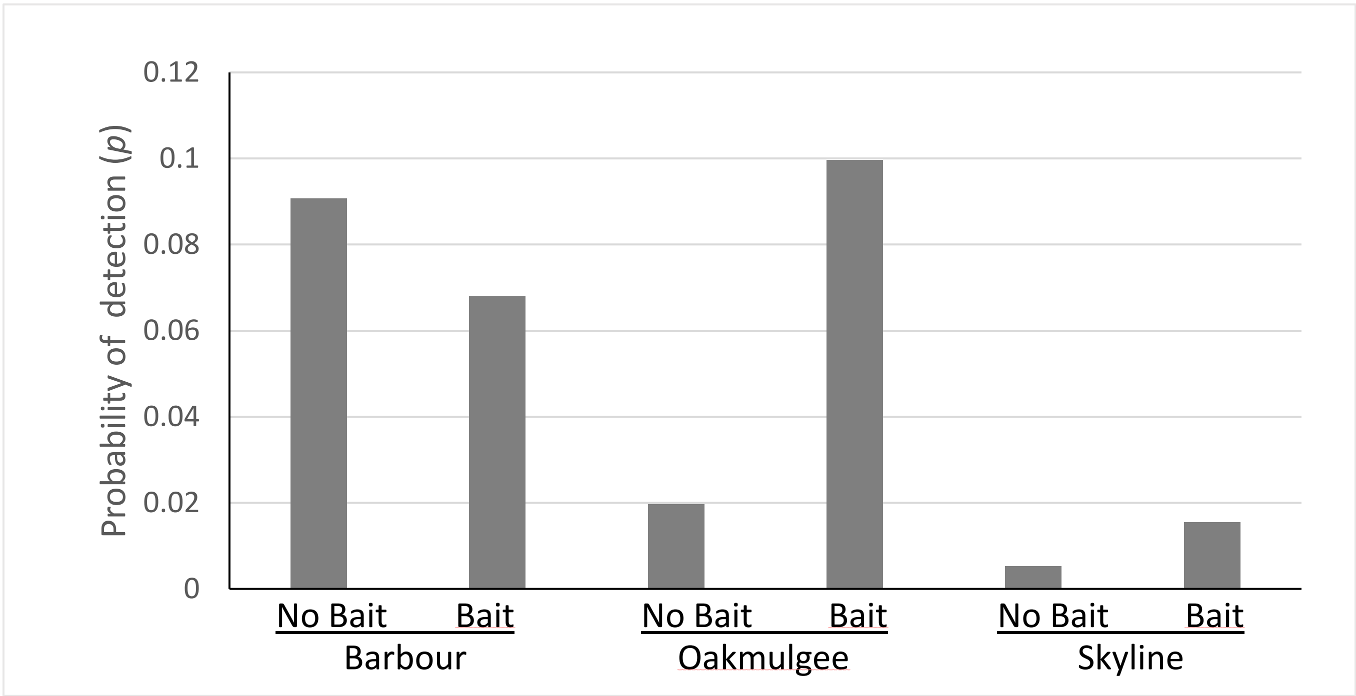


Figure 1.2. Probability of detection during no bait and bait camera surveys on each study area, for adult male wild turkeys using time-lapse cameras in Alabama, summer 2017 and 2018.

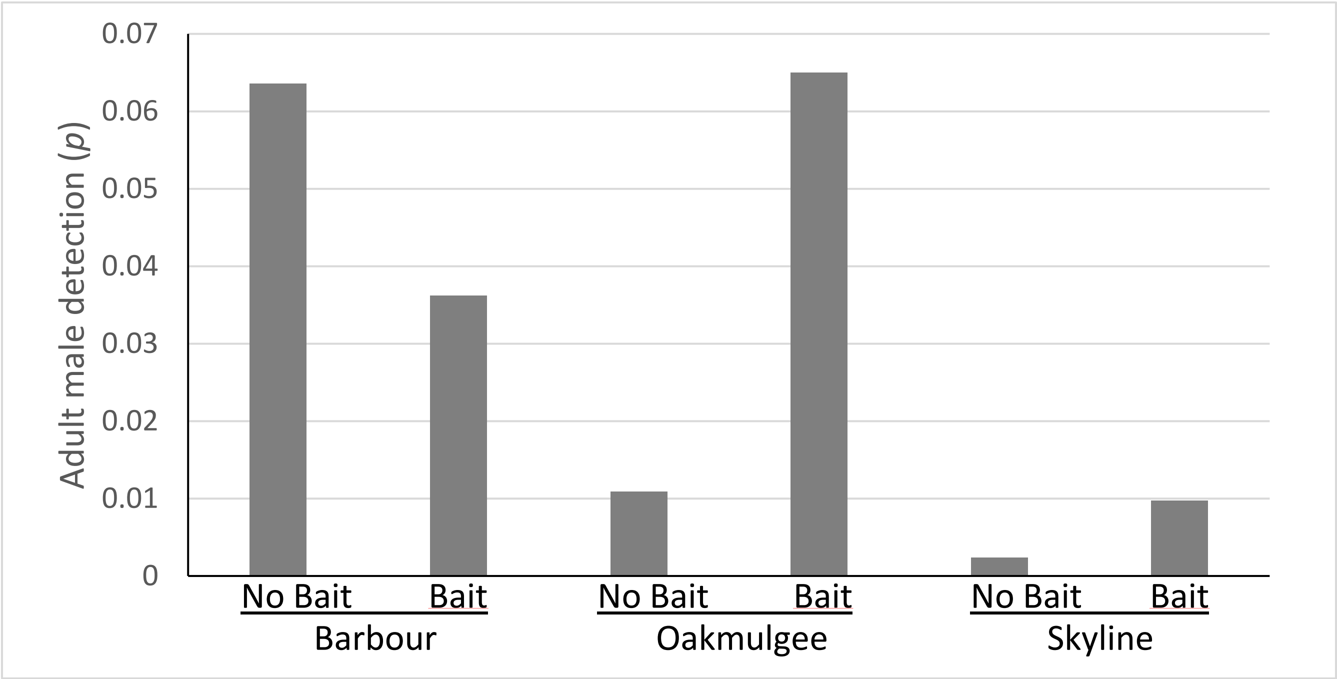


Figure 1.3. Probability of detection during no bait and baited camera surveys on each study area, for adult female wild turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

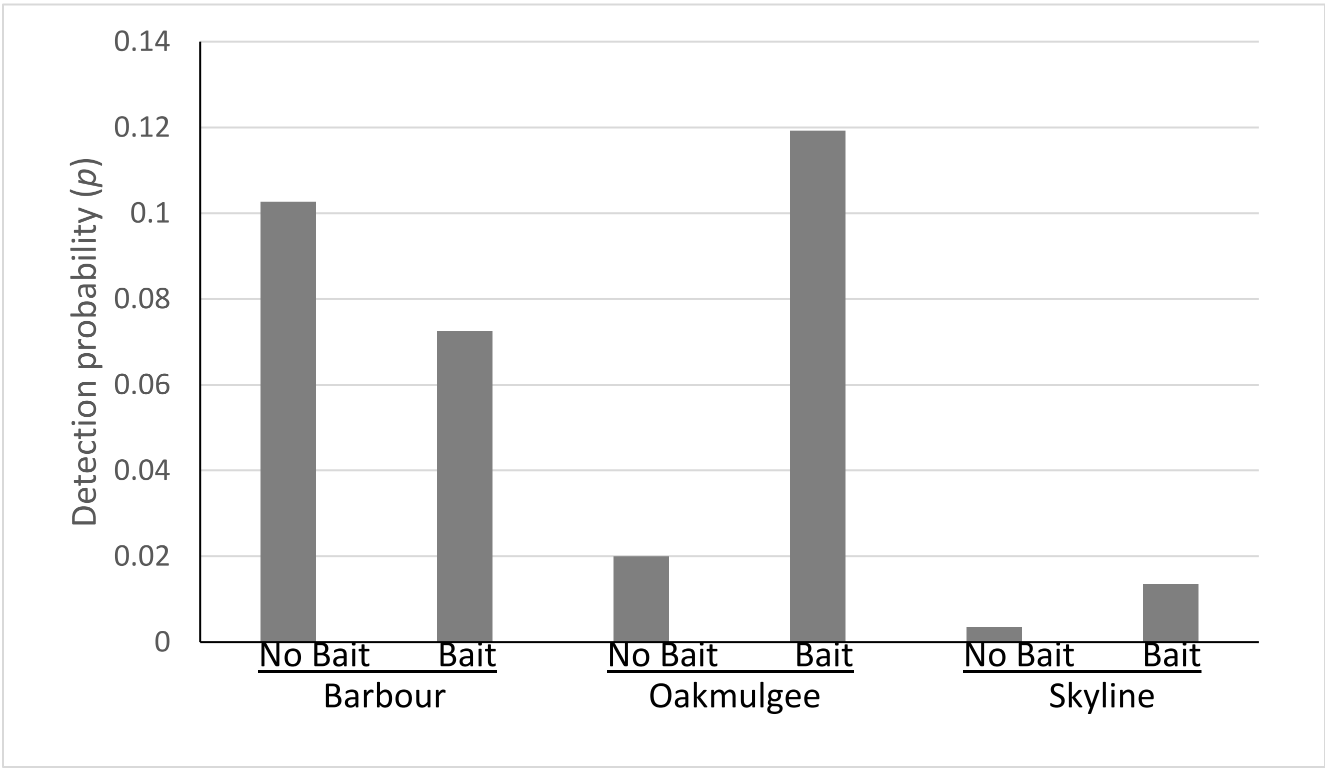


Figure 1.4. Probability of detection during no bait and baited camera surveys on each study area, for total poults, using time-lapse cameras in Alabama, summer 2017 and 2018.

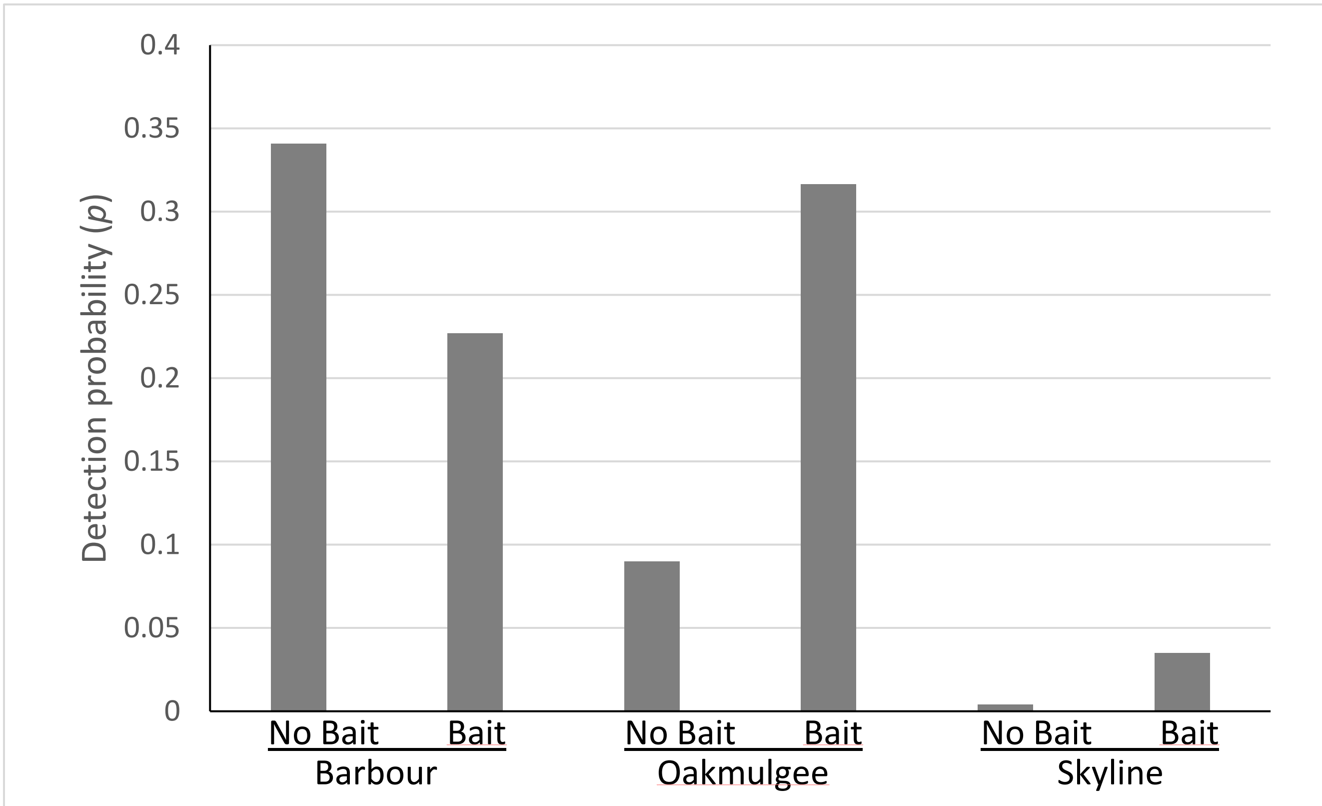


Figure 1.5. Probability of detection during no bait and baited camera surveys on each study area, for Poult 2 wild turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

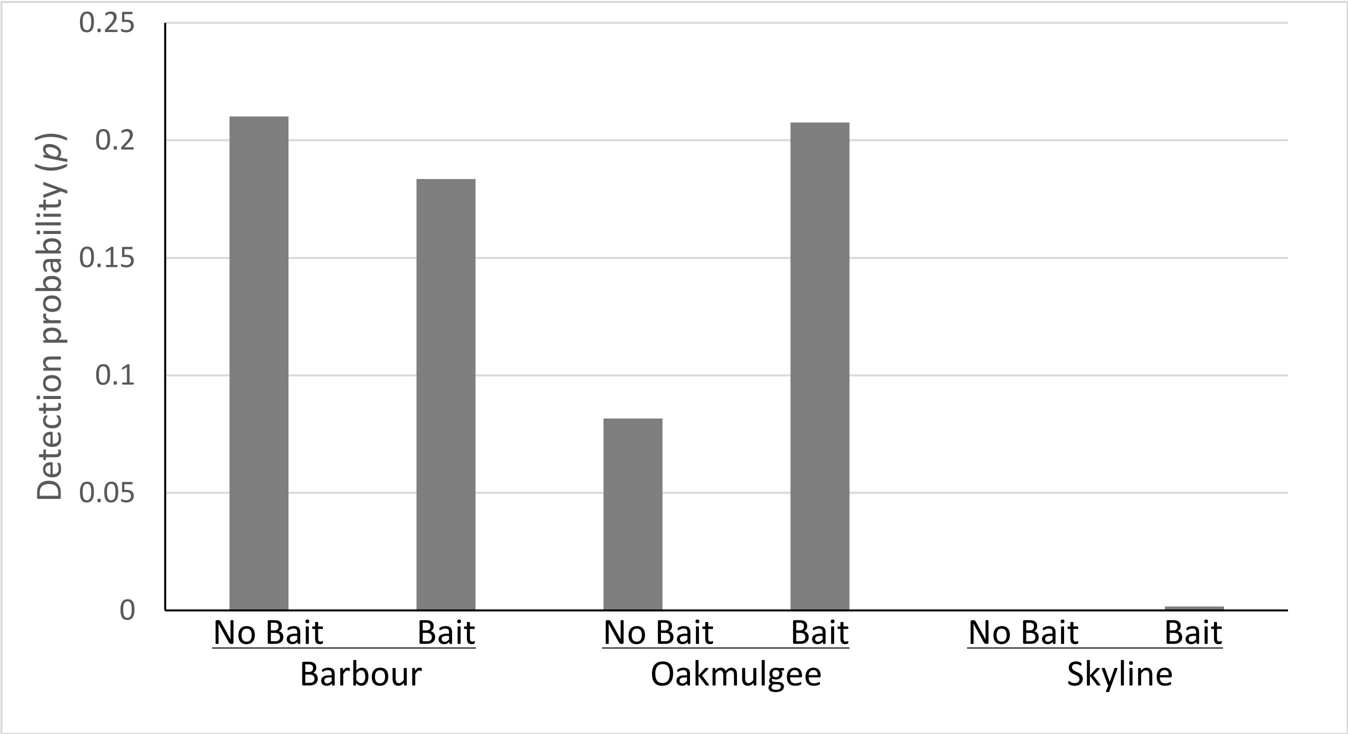


Figure 1.6. Probability of detection at each site type within each study area, for all turkeys using time-lapse cameras in Alabama, summer 2017 and 2018.

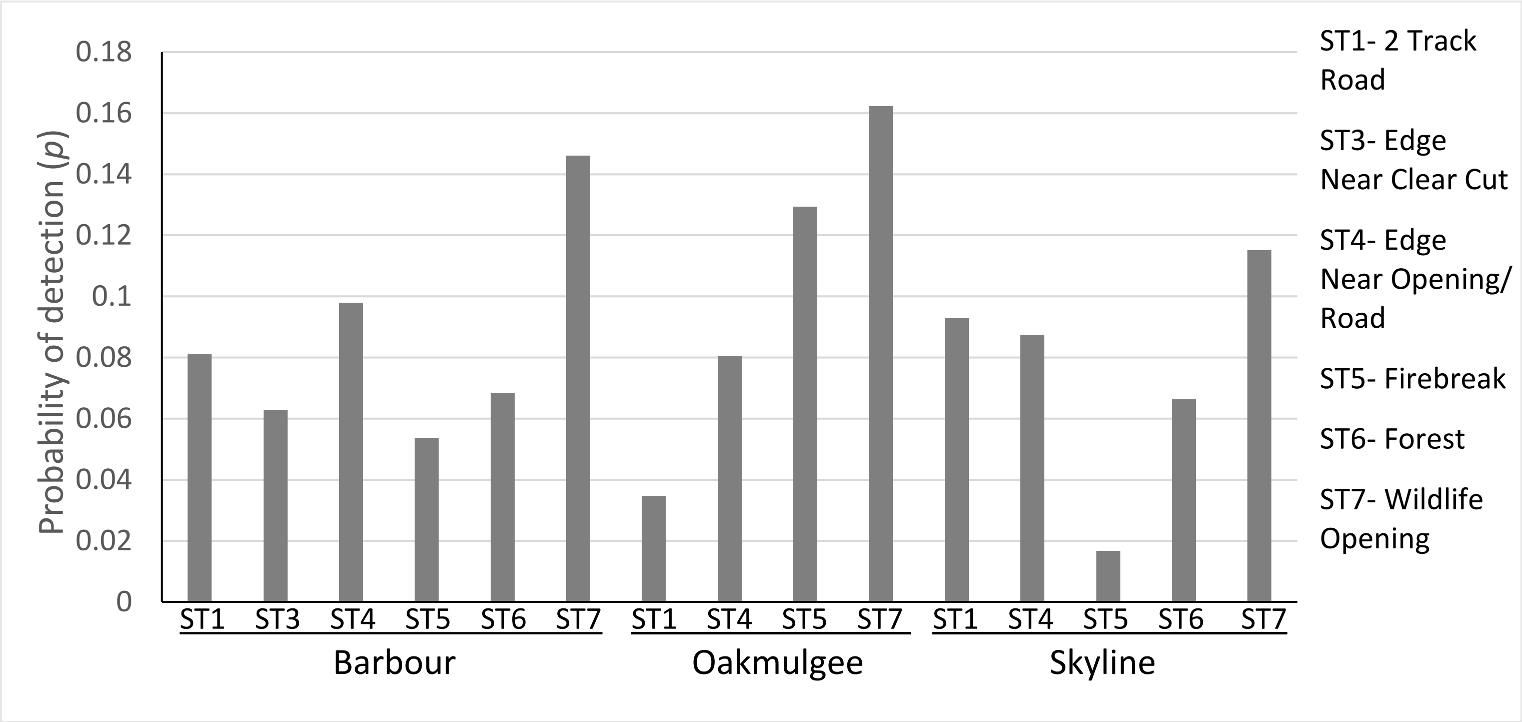


Figure 1.7. Probability of detection at each site type within each study area, for adult male wild turkeys using time-lapse cameras in Alabama, summer 2017 and 2018.

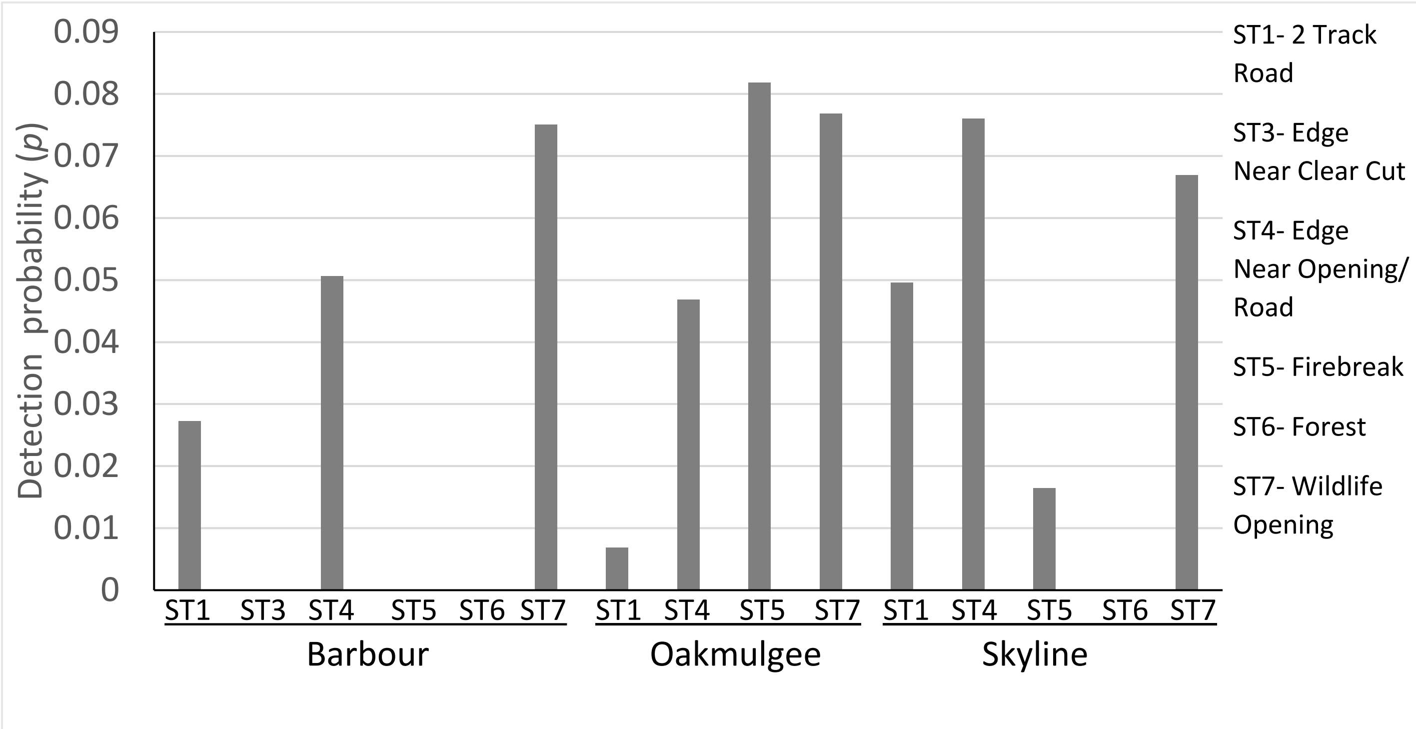


Figure 1.8. Probability of detection at each site type within each study area, for adult female wild turkeys using time-lapse cameras in Alabama, summer 2017 and 2018.

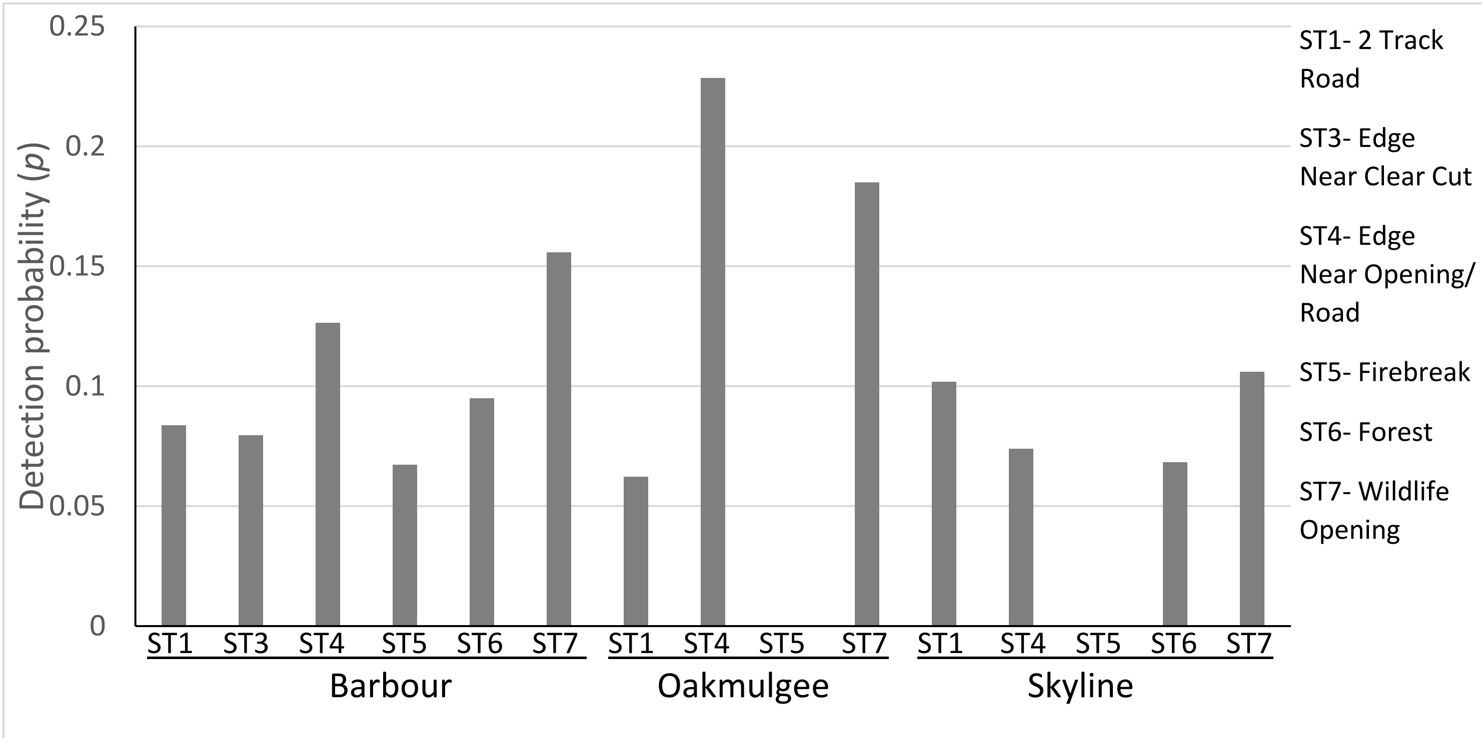


Figure 1.9. Probability of detection at each site type within each study area, for total poults using time-lapse cameras in Alabama, summer 2017 and 2018.

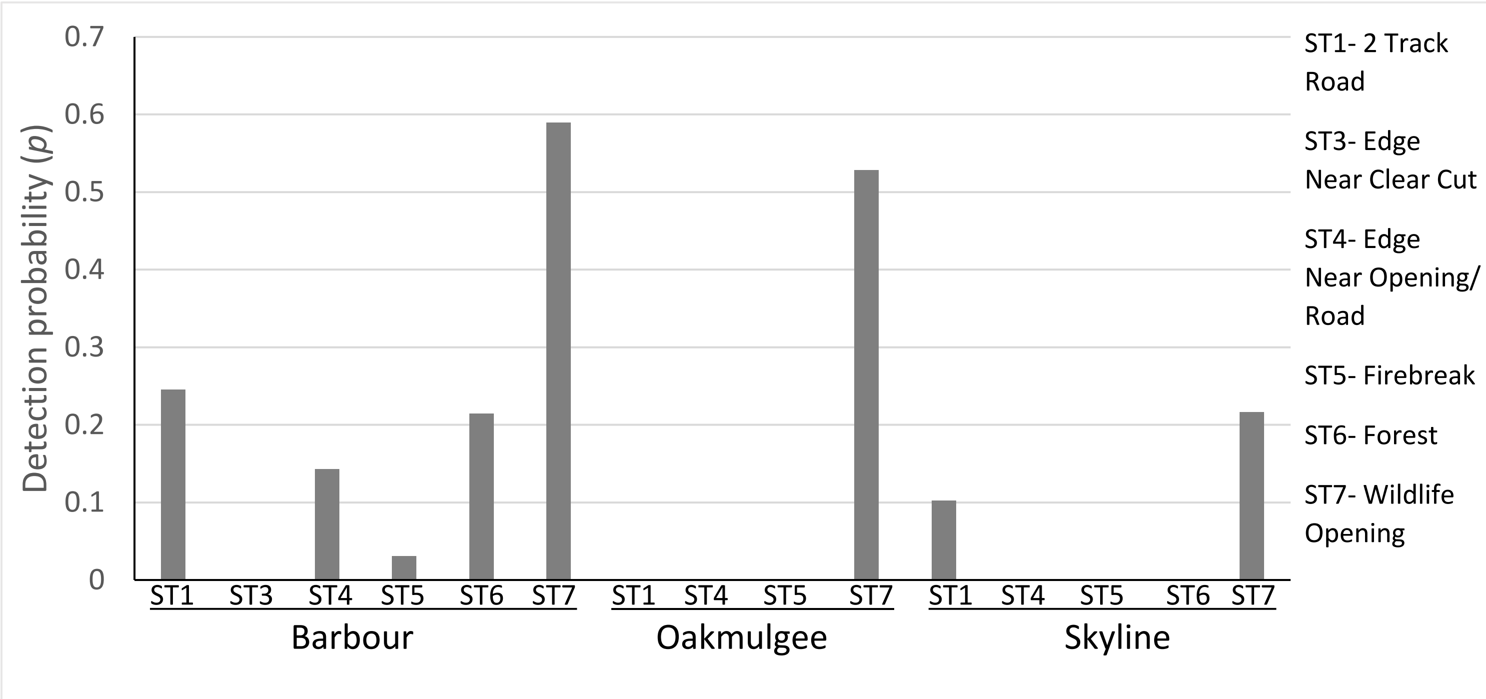


Figure 1.10. Probability of detection at each site type within each study area, for Poult 2 wild turkeys using time-lapse cameras in Alabama, summer 2017 and 2018.

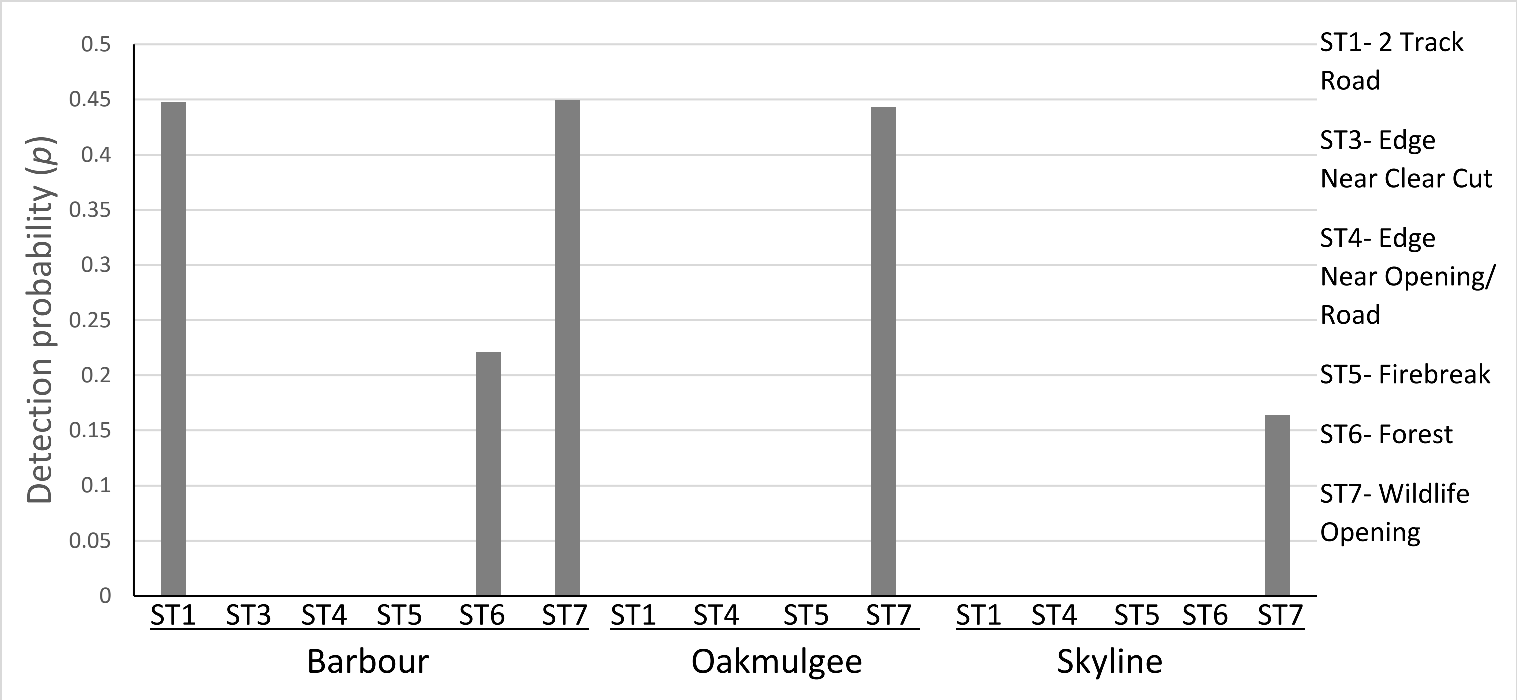


Figure 1.11. Probability of detection across time of day at each study area for all turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

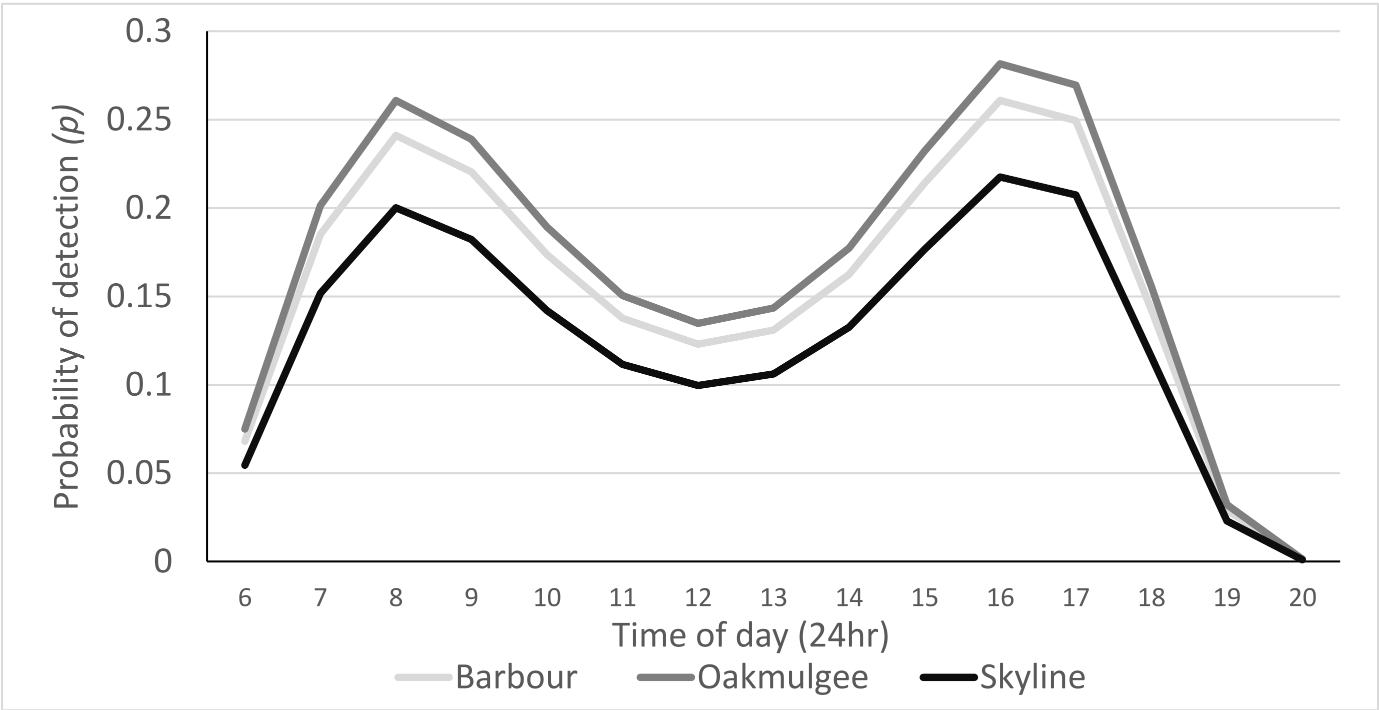


Figure 1.12. Probability of detection across time of day at each study area for adult male wild turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

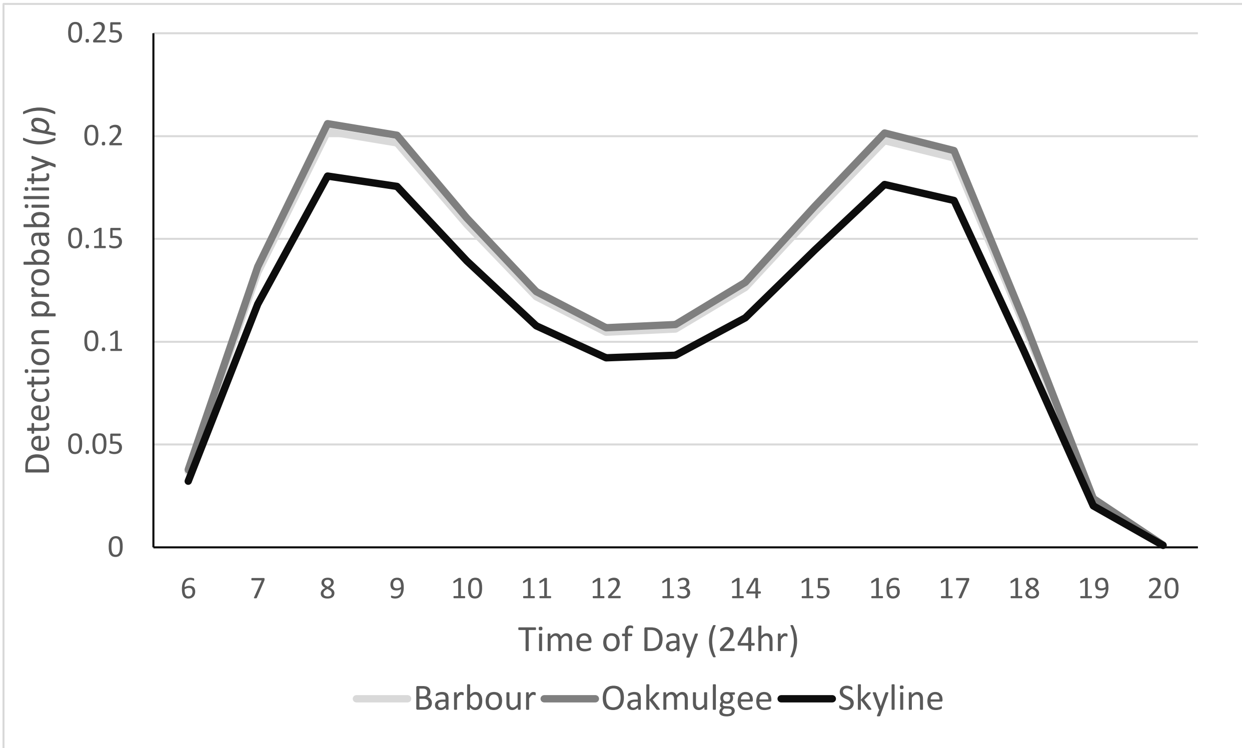


Figure 1.13. Probability of detection across time of day at each study area for adult female wild turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

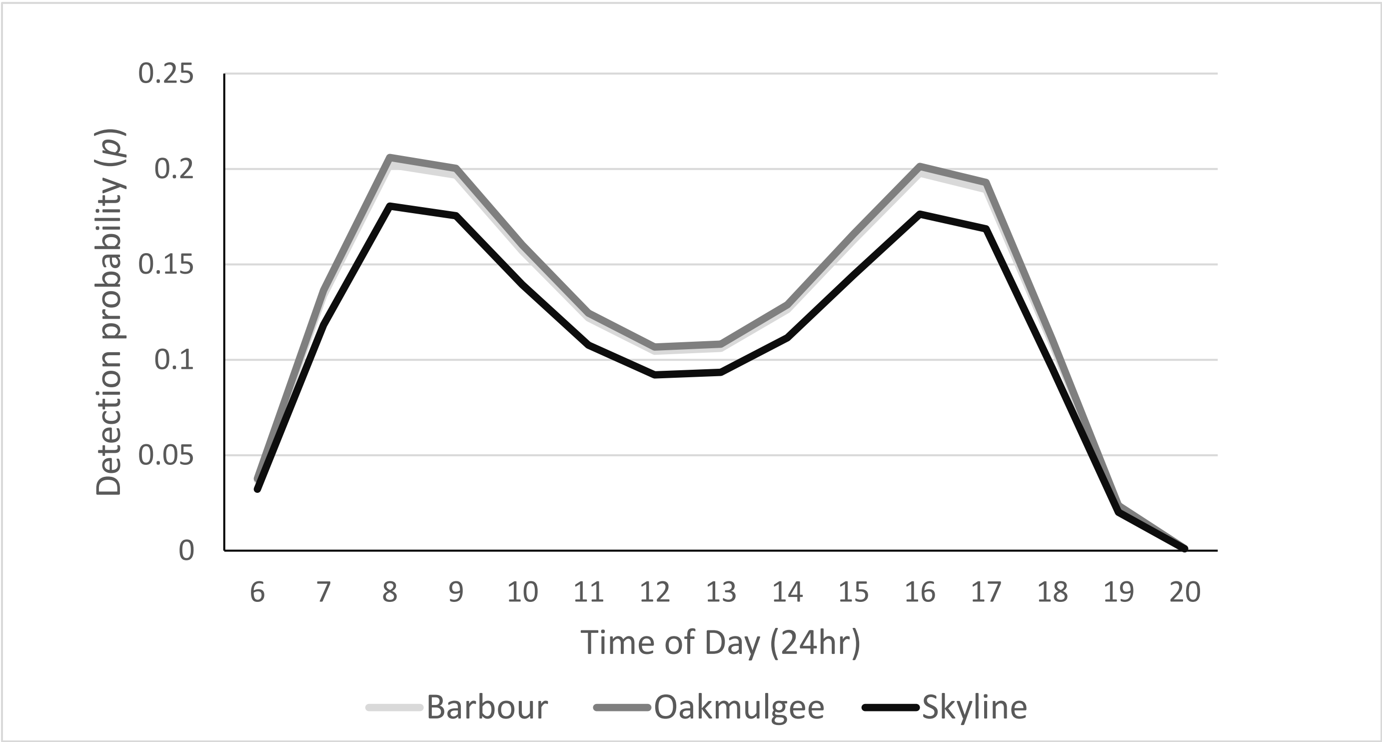


Figure 1.14. Probability of detection across time of day at each study area for total poults, using time-lapse cameras in Alabama, summer 2017 and 2018.

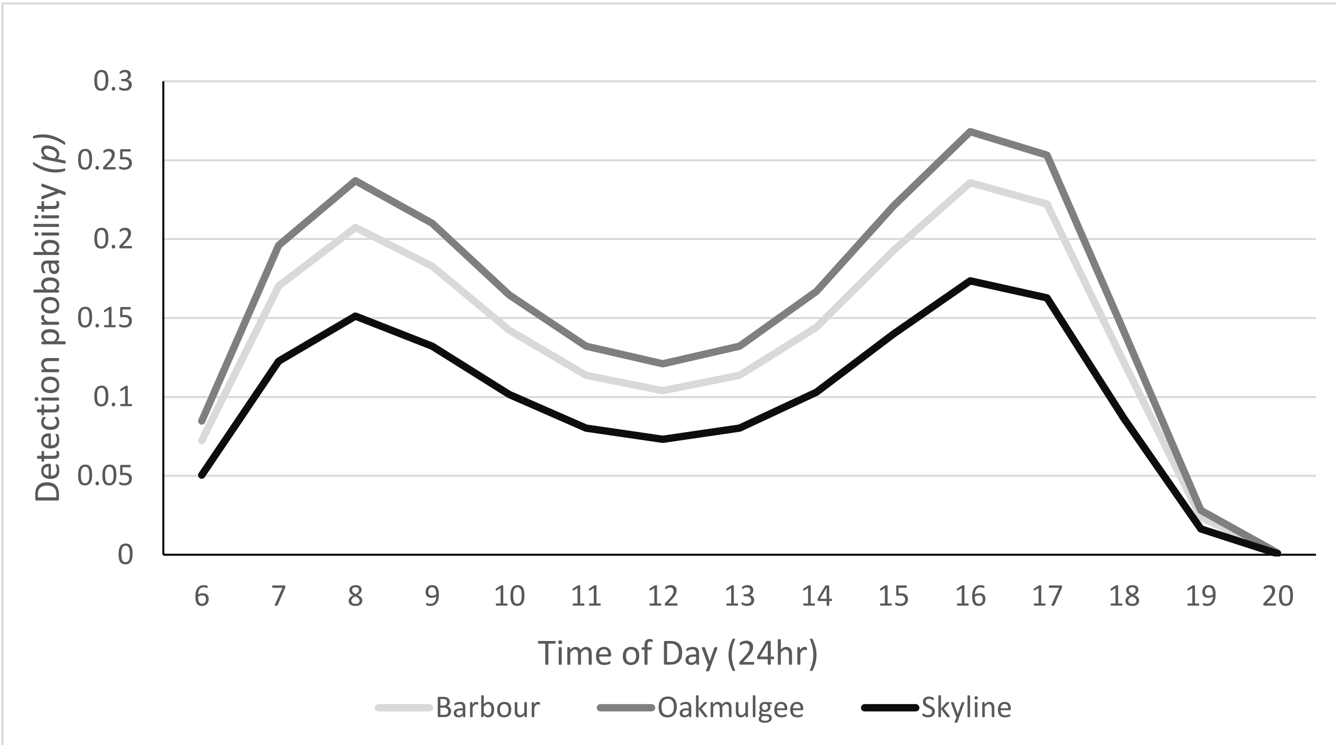


Figure 1.15. Probability of detection across time of day at each study area for Poult 3 wild turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

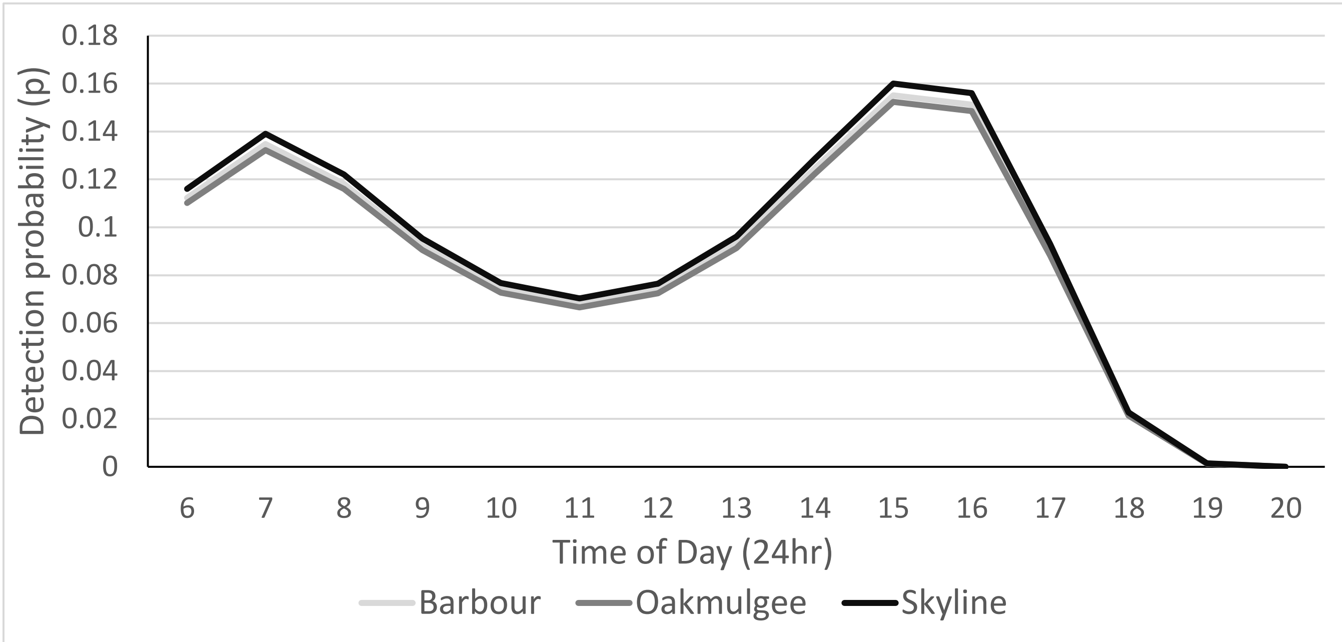


Figure 1.16. Probability of detection across time of day at each study area for Poult 2 wild turkeys, using time-lapse cameras in Alabama, summer 2017 and 2018.

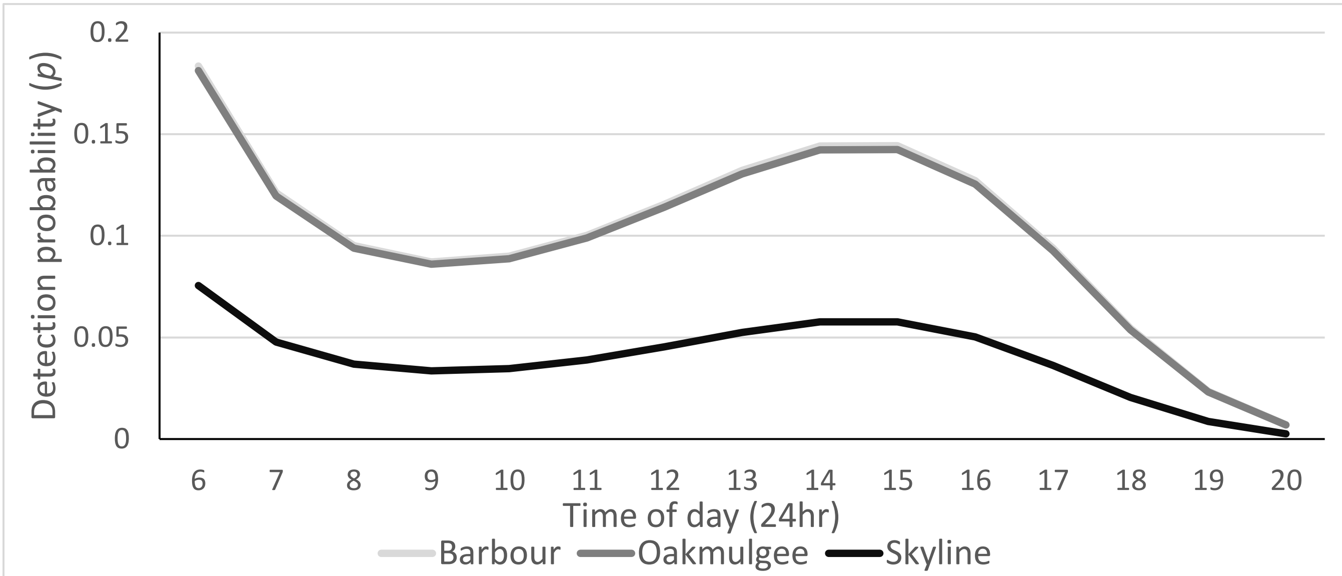


Figure 1.17. Probability of use by all turkeys for wildlife openings and randomly selected sites across study areas, using time-lapse cameras in Alabama, summer 2017 and 2018.

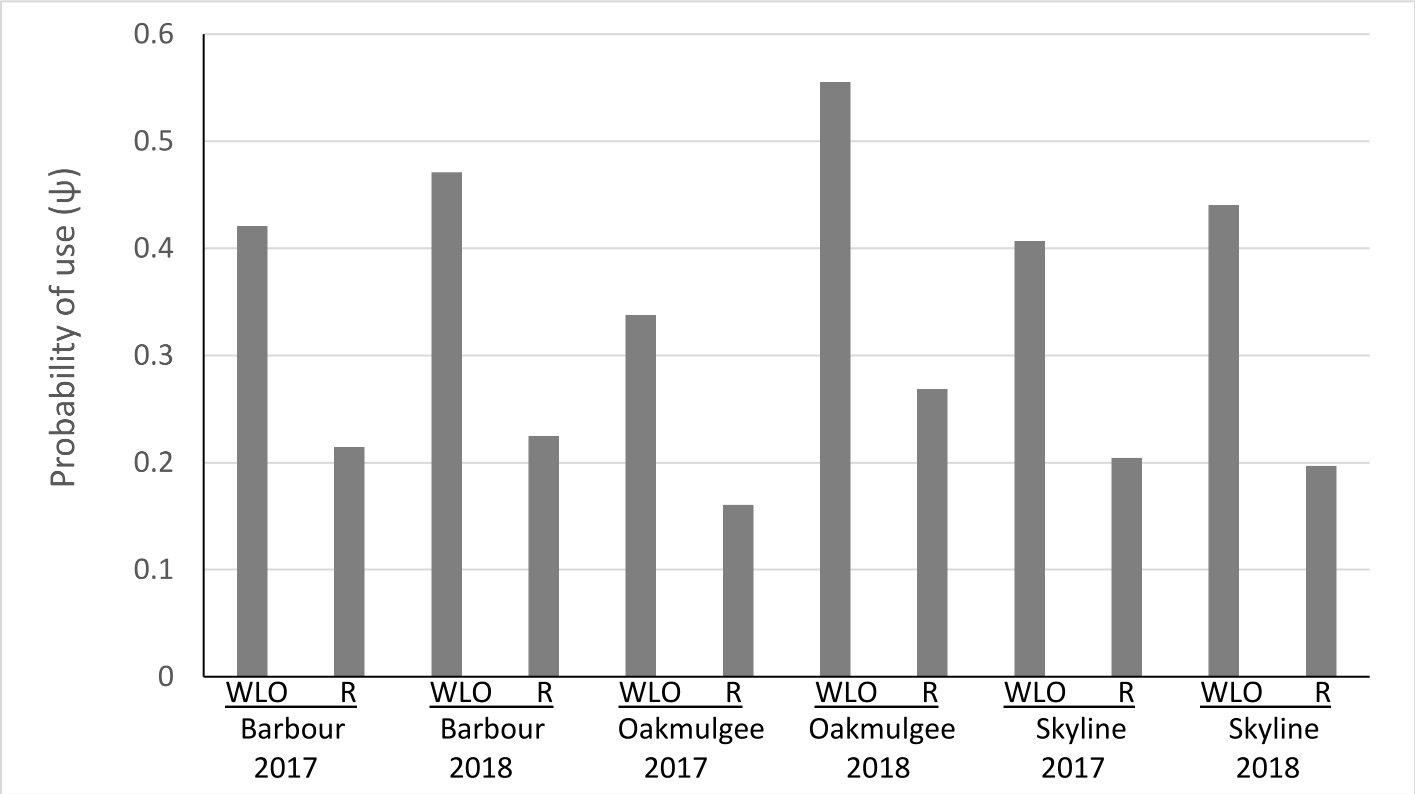


Figure 1.18. Probability of use by adult female wild turkeys for wildlife openings and randomly selected sites across study areas, using time-lapse cameras in Alabama, summer 2017 and 2018.

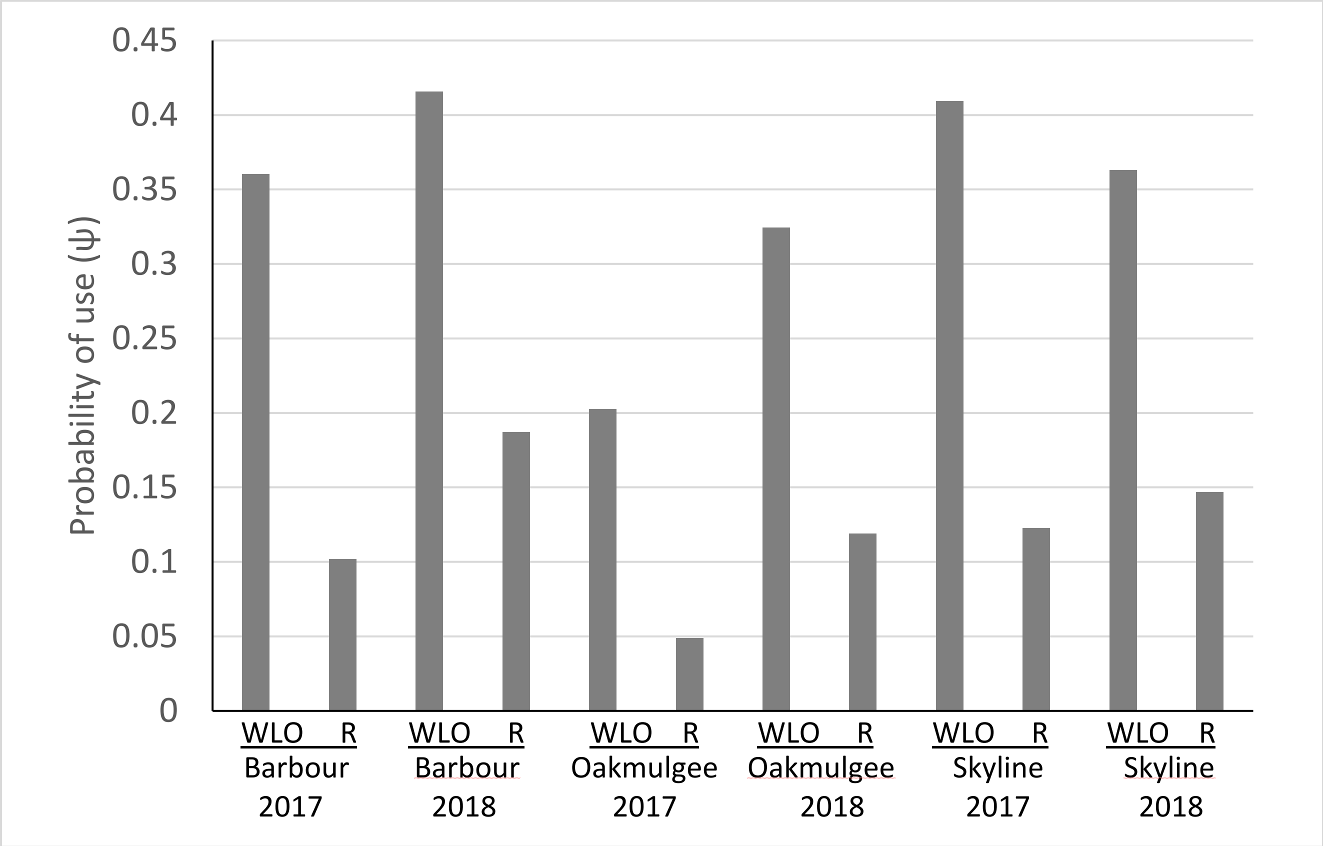


Figure 1.19. Probability of use by adult male wild turkey in no bait and bait camera surveys across study areas, using time-lapse cameras in Alabama, summer 2017 and 2018.

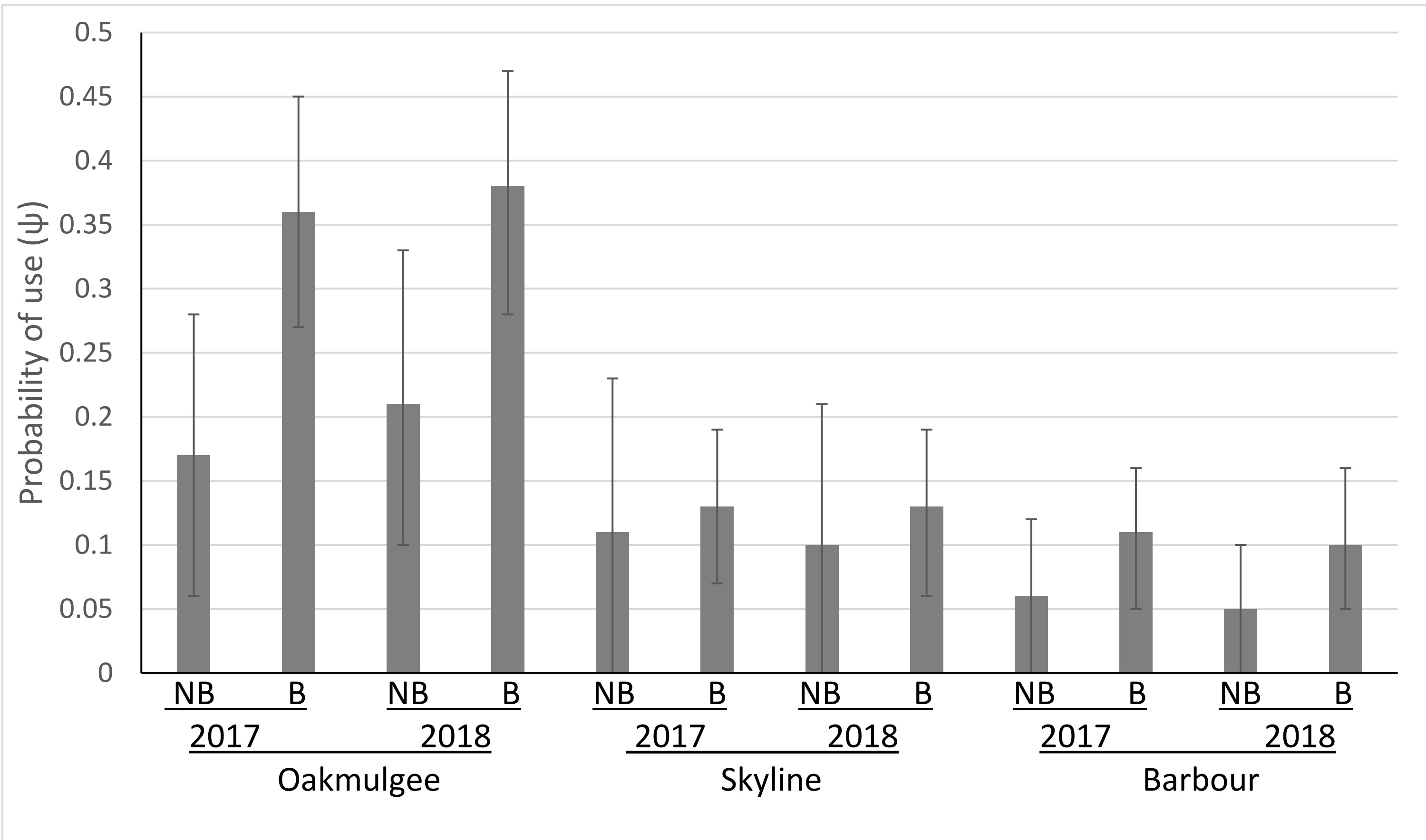


Figure 1.20. Relationships of total poult probability of use in no bait and baited surveys across study areas, using time-lapse cameras in Alabama, summer 2017 and 2018.

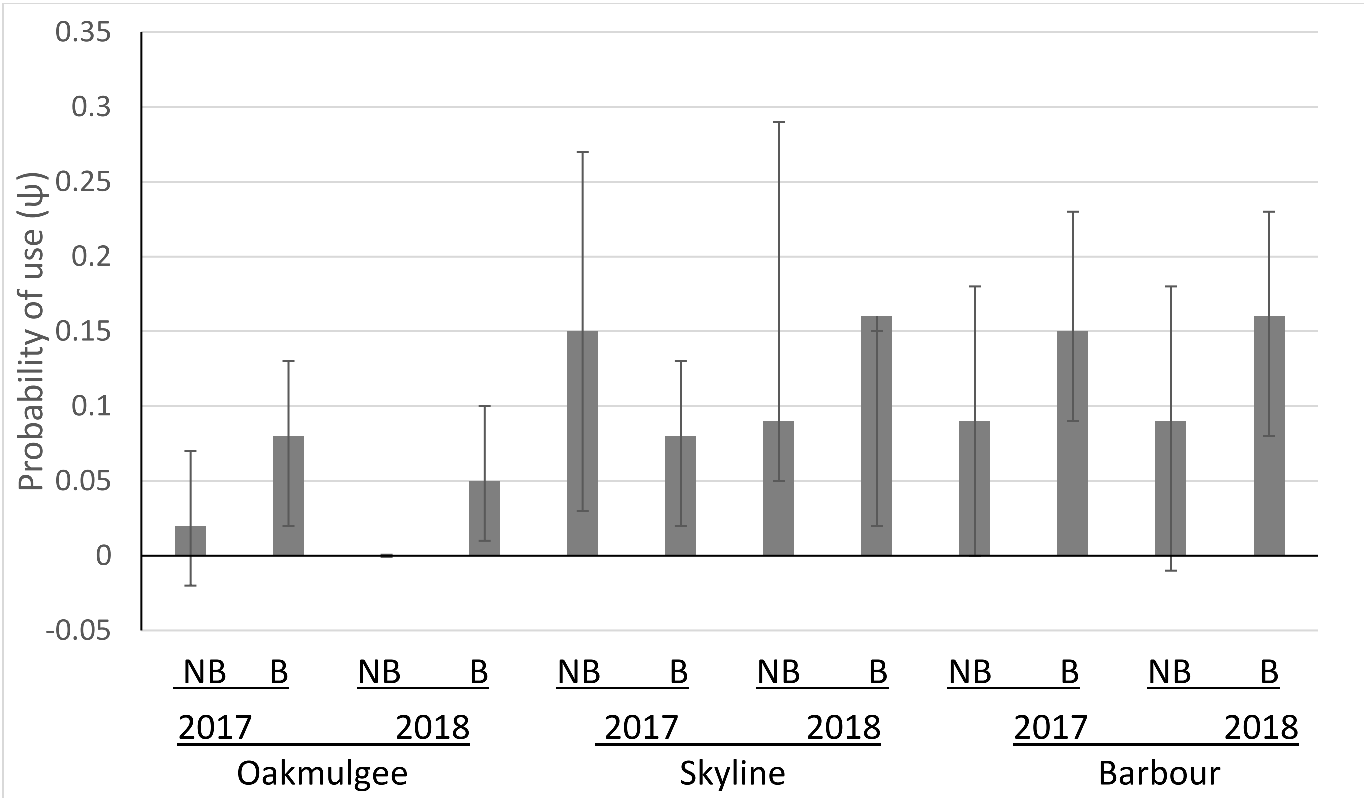


Figure 1.21. Relationships of Poult 3 probability of use in the presence of bait, across study areas, using time-lapse cameras in Alabama, summer 2017 and 2018.

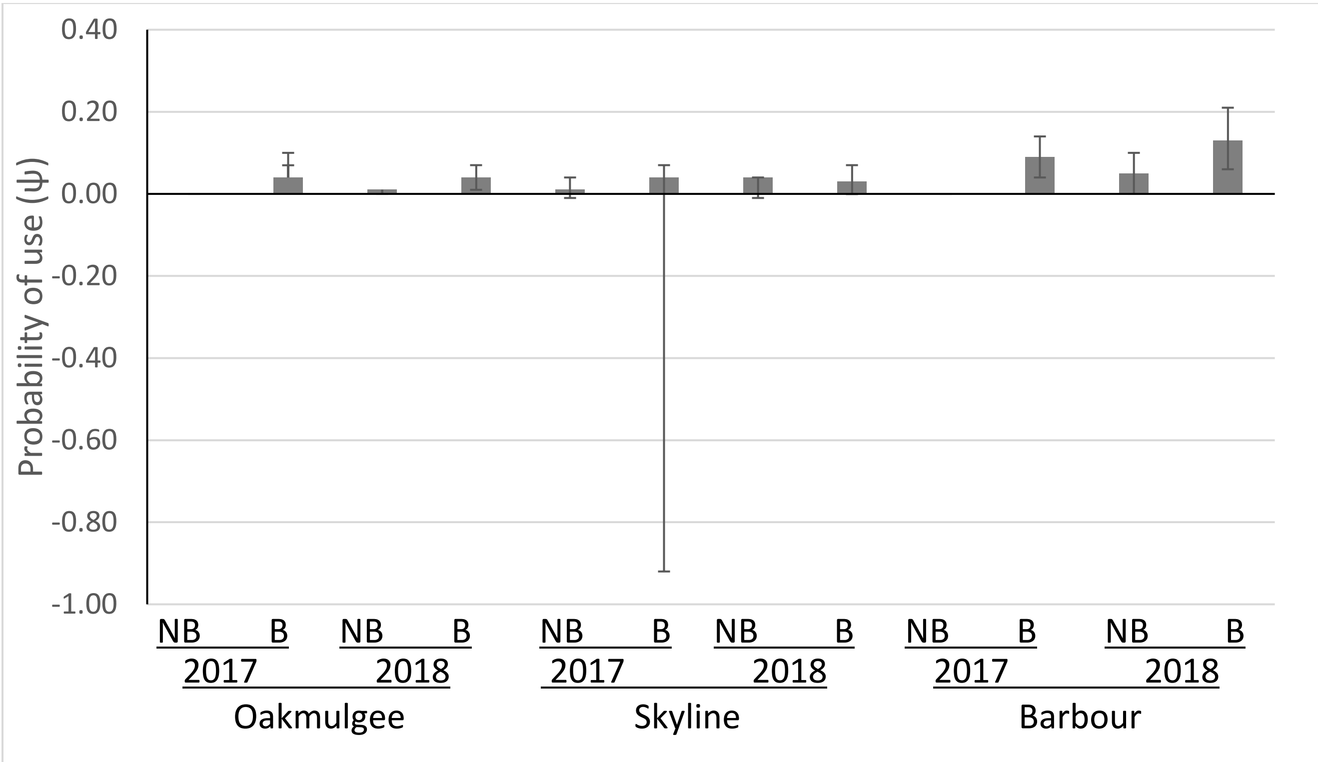
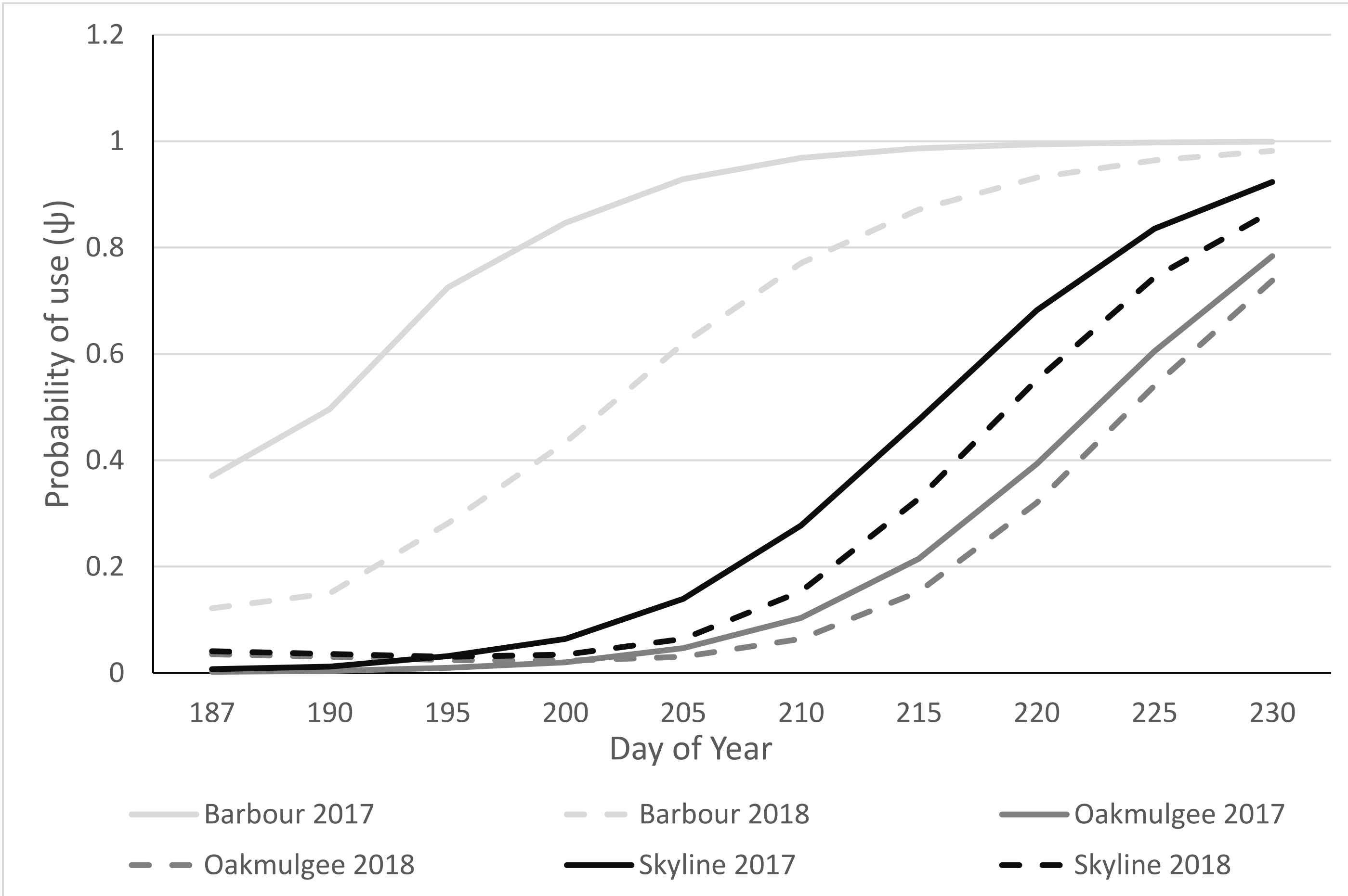


Figure 1.22. Probability of use in Poult 2 wild turkeys at Barbour Wildlife Management area across day of year, using time-lapse cameras in Alabama, summer 2017 and 2018.



Appendices

Appendix 1.1. Estimates of annual occupancy ($\hat{\psi}$) from the best occupancy model for all turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[24]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.22	0.06	0.10	0.33
Group 1 Session 2	0.37	0.04	0.30	0.45
Group 1 Session 3	0.43	0.05	0.34	0.52
Group 1 Session 4	0.45	0.05	0.35	0.55
Group 2 Session 1	0.27	0.07	0.14	0.41
Group 2 Session 2	0.28	0.04	0.21	0.35
Group 2 Session 3	0.28	0.04	0.21	0.36
Group 2 Session 4	0.28	0.04	0.20	0.37
Group 3 Session 1	0.29	0.06	0.18	0.40
Group 3 Session 2	0.31	0.03	0.25	0.38
Group 3 Session 3	0.32	0.04	0.24	0.40
Group 3 Session 4	0.32	0.04	0.24	0.40

[24]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.2. Estimates of annual occupancy ($\hat{\psi}$) from the best occupancy model for adult male wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[25]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.17	0.06	0.06	0.28
Group 1 Session 2	0.36	0.04	0.27	0.45
Group 1 Session 3	0.21	0.06	0.10	0.33
Group 1 Session 4	0.38	0.05	0.28	0.47
Group 2 Session 1	0.11	0.06	-0.01	0.23
Group 2 Session 2	0.13	0.03	0.07	0.19
Group 2 Session 3	0.10	0.05	0	0.21
Group 2 Session 4	0.13	0.03	0.06	0.19
Group 3 Session 1	0.06	0.03	0	0.12
Group 3 Session 2	0.11	0.03	0.05	0.16
Group 3 Session 3	0.05	0.03	0	0.10
Group 3 Session 4	0.10	0.03	0.05	0.16

[25]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.3. Estimates of annual occupancy ($\hat{\psi}$) from the best occupancy model for adult female wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[26]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.09	0.04	0.01	0.16
Group 1 Session 2	0.18	0.03	0.12	0.24
Group 1 Session 3	0.22	0.04	0.14	0.30
Group 1 Session 4	0.24	0.05	0.15	0.34
Group 2 Session 1	0.21	0.08	0.06	0.36
Group 2 Session 2	0.21	0.03	0.14	0.27
Group 2 Session 3	0.21	0.03	0.14	0.27
Group 2 Session 4	0.21	0.03	0.14	0.27
Group 3 Session 1	0.18	0.05	0.08	0.27
Group 3 Session 2	0.25	0.03	0.19	0.32
Group 3 Session 3	0.26	0.04	0.19	0.33
Group 3 Session 4	0.26	0.04	0.19	0.33

[26]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.4. Estimates of annual occupancy ($\hat{\psi}$) from the best occupancy model for total poults. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[27]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.02	0.02	-0.02	0.07
Group 1 Session 2	0.08	0.03	0.02	0.13
Group 1 Session 3	0.36E-07	0.35E-04	-0.68E-04	0.68E-04
Group 1 Session 4	0.05	0.02	0.01	0.10
Group 2 Session 1	0.15	0.06	0.03	0.27
Group 2 Session 2	0.08	0.03	0.02	0.13
Group 2 Session 3	0.09	0.06	0.05	0.29
Group 2 Session 4	0.16	0.03	0.02	0.15
Group 3 Session 1	0.09	0.05	0	0.18
Group 3 Session 2	0.15	0.04	0.09	0.23
Group 3 Session 3	0.09	0.05	-0.01	0.18
Group 3 Session 4	0.16	0.04	0.08	0.23

[27]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.5. Estimates of annual occupancy ($\hat{\psi}$) from the best occupancy model for Poult 2 wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[28]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.01	0.01	-0.02	0.04
Group 1 Session 2	0.01	0.01	-0.01	0.03
Group 1 Session 3	0.01	0.01	-0.01	0.04
Group 1 Session 4	0.01	0.01	-0.01	0.04
Group 2 Session 1	0.03	0.03	-0.03	0.10
Group 2 Session 2	0.04	0.02	0	0.08
Group 2 Session 3	0.05	0.02	0.01	0.09
Group 2 Session 4	0.05	0.03	0	0.10
Group 3 Session 1	0.72	0.34	0.06	1.38
Group 3 Session 2	0.10	0.05	0.01	0.19
Group 3 Session 3	0.04	0.02	0	0.08
Group 3 Session 4	0.03	0.02	-0.01	0.08

[28]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.6. Estimates of annual occupancy ($\hat{\psi}$) from the best occupancy model for Poult 3 wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[29]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.13E-259	0	0.13E-259	0.13E-259
Group 1 Session 2	0.04	0.02	0.1	0.07
Group 1 Session 3	0.98E-231	0	0.98E-231	0.98E-231
Group 1 Session 4	0.04	0.02	0.01	0.07
Group 2 Session 1	0.01	0.01	-0.01	0.04
Group 2 Session 2	0.03	0.02	-0.92	0.07
Group 2 Session 3	0.01	0.01	-0.01	0.04
Group 2 Session 4	0.03	0.02	-0.41E-03	0.07
Group 3 Session 1	0.43E-201	0	0.43E-201	0.43E-201
Group 3 Session 2	0.09	0.02	0.04	0.14
Group 3 Session 3	0.05	0.03	0	0.10
Group 3 Session 4	0.14	0.04	0.06	0.21

[29]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.7. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* randomly selected site occupancy model for all turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[30]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.22	0.06	0.10	0.33
Group 1 Session 2	0.37	0.04	0.30	0.45
Group 1 Session 3	0.43	0.05	0.34	0.52
Group 1 Session 4	0.45	0.05	0.35	0.55
Group 2 Session 1	0.27	0.07	0.14	0.41
Group 2 Session 2	0.28	0.04	0.21	0.35
Group 2 Session 3	0.28	0.04	0.21	0.36
Group 2 Session 4	0.28	0.04	0.20	0.37
Group 3 Session 1	0.29	0.06	0.18	0.40
Group 3 Session 2	0.31	0.03	0.25	0.38
Group 3 Session 3	0.32	0.04	0.24	0.40
Group 3 Session 4	0.32	0.04	0.24	0.40

[30]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.8. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* randomly selected site and bait interaction occupancy model for all turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[31]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.20	0.05	0.10	0.30
Group 1 Session 2	0.46	0.05	0.37	0.55
Group 1 Session 3	0.23	0.05	0.12	0.33
Group 1 Session 4	0.47	0.05	0.37	0.57
Group 2 Session 1	0.28	0.08	0.13	0.43
Group 2 Session 2	0.27	0.04	0.20	0.35
Group 2 Session 3	0.31	0.07	0.16	0.45
Group 2 Session 4	0.28	0.04	0.20	0.37
Group 3 Session 1	0.28	0.06	0.18	0.39
Group 3 Session 2	0.39	0.04	0.31	0.48
Group 3 Session 3	0.18	0.05	0.09	0.27
Group 3 Session 4	0.36	0.04	0.28	0.45

[31]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.9. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* occupancy model for adult male wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[32]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.17	0.06	0.06	0.29
Group 1 Session 2	0.35	0.04	0.26	0.43
Group 1 Session 3	0.24	0.05	0.13	0.34
Group 1 Session 4	0.38	0.05	0.28	0.47
Group 2 Session 1	0.10	0.05	0	0.20
Group 2 Session 2	0.14	0.03	0.08	0.20
Group 2 Session 3	0.07	0.03	0.02	0.12
Group 2 Session 4	0.13	0.03	0.07	0.20
Group 3 Session 1	0.06	0.03	0	0.12
Group 3 Session 2	0.11	0.03	0.05	0.16
Group 3 Session 3	0.05	0.02	0.01	0.09
Group 3 Session 4	0.10	0.03	0.05	0.16

[32]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.10. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* randomly selected site occupancy model for adult female wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[33]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.09	0.04	0.01	0.16
Group 1 Session 2	0.18	0.03	0.12	0.24
Group 1 Session 3	0.22	0.04	0.14	0.30
Group 1 Session 4	0.24	0.05	0.15	0.34
Group 2 Session 1	0.21	0.08	0.06	0.36
Group 2 Session 2	0.21	0.03	0.14	0.27
Group 2 Session 3	0.21	0.03	0.14	0.27
Group 2 Session 4	0.21	0.03	0.14	0.27
Group 3 Session 1	0.18	0.05	0.08	0.27
Group 3 Session 2	0.25	0.03	0.19	0.32
Group 3 Session 3	0.26	0.04	0.19	0.33
Group 3 Session 4	0.26	0.04	0.19	0.33

[33]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.11. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* randomly selected site and bait interaction occupancy model for adult female wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[34]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.08	0.03	0.02	0.15
Group 1 Session 2	0.20	0.03	0.14	0.27
Group 1 Session 3	0.16	0.04	0.09	0.23
Group 1 Session 4	0.24	0.04	0.16	0.33
Group 2 Session 1	0.19	0.07	0.05	0.32
Group 2 Session 2	0.23	0.03	0.16	0.30
Group 2 Session 3	0.13	0.03	0.07	0.19
Group 2 Session 4	0.22	0.04	0.15	0.29
Group 3 Session 1	0.17	0.05	0.08	0.27
Group 3 Session 2	0.30	0.04	0.22	0.37
Group 3 Session 3	0.18	0.04	0.11	0.26
Group 3 Session 4	0.30	0.04	0.22	0.38

[34]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.12. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* occupancy model for total poults. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[35]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.02	0.02	-0.02	0.07
Group 1 Session 2	0.08	0.03	0.01	0.13
Group 1 Session 3	0.36E-07	0.35E-04	-0.68E-04	0.68E-04
Group 1 Session 4	0.05	0.02	0.01	0.10
Group 2 Session 1	0.15	0.06	0.03	0.26
Group 2 Session 2	0.08	0.03	0.02	0.13
Group 2 Session 3	0.17	0.06	0.05	0.29
Group 2 Session 4	0.09	0.03	0.02	0.15
Group 3 Session 1	0.09	0.05	0	0.18
Group 3 Session 2	0.16	0.04	0.09	0.23
Group 3 Session 3	0.09	0.05	-0.01	0.18
Group 3 Session 4	0.16	0.04	0.08	0.23

[35]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.13. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* occupancy model for Poult 2 wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[36]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.01	0.02	-0.02	0.05
Group 1 Session 2	0.03	0.02	-0.01	0.07
Group 1 Session 3	0.69E-04	0	0	0
Group 1 Session 4	0.01	0.01	-0.01	0.04
Group 2 Session 1	0.06	0.05	-0.03	0.15
Group 2 Session 2	0.03	0.02	0	0.06
Group 2 Session 3	0.05	0.03	0	0.10
Group 2 Session 4	0.03	0.02	0	0.06
Group 3 Session 1	0.24	0.13	-0.01	0.50
Group 3 Session 2	0.27	0.12	0.02	0.51
Group 3 Session 3	0.34E-24	0.21E-22	-0.40E-22	0.41E-22
Group 3 Session 4	0.03	0.02	-0.01	0.07

[36]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.14. Estimates of annual occupancy ($\hat{\psi}$) from the best *post hoc* occupancy model for Poult 3 wild turkeys. Values for $\hat{\psi}$, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.

[37]Parameter	Estimate	SE	LCI	UCI
Group 1 Session 1	0.56E-308	0	0.56E-308	0.56E-308
Group 1 Session 2	0.04	0.01	0.1	0.06
Group 1 Session 3	0.01	0.01	0	0.02
Group 1 Session 4	0.04	0.02	0.01	0.08
Group 2 Session 1	0.01	0.01	-0.02	0.04
Group 2 Session 2	0.04	0.02	0	0.07
Group 2 Session 3	0.04	0	0	0.02
Group 2 Session 4	0.03	0.02	0.99E-03	0.06
Group 3 Session 1	0.56E-308	0	0.56E-308	0.56E-308
Group 3 Session 2	0.09	0.02	0.05	0.14
Group 3 Session 3	0.05	0.02	0	0.09
Group 3 Session 4	0.13	0.03	0.07	0.20

[37]Group 1- Oakmugee WMA. Group 2- Skyline WMA. Group 3- Barbour WMA. Session 1- no bait camera survey conducted in 2017. Session 2- baited camera survey conducted in 2017. Session 3- no bait camera survey conducted in 2018. Session 4- baited camera survey conducted in 2018.

Appendix 1.15. Beta estimates from my best fit model for all turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[1]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-0.32	0.32	-0.95	0.31
Psi R	-0.98	0.36	-1.68	-0.28
Psi g1	-0.35	0.43	-1.19	0.49
Psi g2	-0.06	0.44	-0.93	0.81
Epsilon Intercept	-0.13	0.29	-0.70	0.44
Eps R	0.61	0.35	-0.08	1.29
Epsilon g1	-0.92	0.42	-1.74	-0.09
Epsilon g2	-0.14	0.40	-0.92	0.65
Gamma Intercept	-0.30	0.24	-0.76	0.17
Gam R	-1.21	0.24	-1.69	-0.73
Gamma g1	0.14	0.29	-0.42	0.70
Gamma g2	-0.30	0.30	-0.89	0.29
p Intercept	-2.62	0.16	-2.92	-2.31
Bait	0.31	0.12	0.07	0.55
TOD	166.84	17.93	131.69	201.99
TOD2	-6065.72	595.73	-7233.35	-4898.09
TOD3	76109.23	7047.45	62296.22	89922.23
TOD4	-305603.78	27114.51	-358748.21	-252459.35
p ST1	-0.59	0.17	-0.93	-0.25
p ST3	-0.84	0.35	-1.53	-0.15
p ST4	-0.40	0.13	-0.66	-0.14
p ST5	-1.00	0.39	-1.77	-0.24
p ST6	-0.76	0.20	-1.15	-0.37
p g1	0.10	0.08	-0.04	0.25
p g1 bait	-1.71	0.12	-1.95	-1.47
p g1 ST1	-0.95	0.40	-1.74	-0.17

Appendix 1.15. Beta estimates from my best fit model for all turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[1]

Parameter	Estimate	SE	LCI	UCI
p g1 ST4	-0.30	0.54	-1.36	0.76
p g1 ST5	0.77	0.87	-0.94	2.48
p g2	-0.24	0.13	-0.50	0.02
p g2 bait	-1.08	0.16	-1.39	-0.76
p g2 ST1	0.37	0.20	-0.02	0.77
p g2 ST4	0.13	0.23	-0.33	0.58
p g2 ST5	-0.93	0.66	-2.22	0.37
p g2 ST6	0.21	0.52	-0.81	1.22

[1]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. R- randomly selected site. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.16. Beta estimates from my best fit model for adult male wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[2]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-2.69	0.52	-3.71	-1.68
Psi g1	1.13	0.66	-0.16	2.41
Psi g2	0.52	0.77	-0.98	2.03
Epsilon Intercept	1.26	0.80	-0.30	2.82
Epsilon g1	-2.09	0.89	-3.83	-0.36
Epsilon g2	-0.76	1.00	-2.71	1.20
Epsilon bait	1.25	0.59	0.10	2.40
Eps g1 bait	-2.22	0.29	-2.80	-1.65
Eps g2 bait	1.26	0.35	0.57	1.96
Gamma Intercept	0.17	0.41	-0.63	0.97
Gamma g1	-0.77	0.40	-1.55	0.01
Gamma g2	-2.08	0.20	-2.47	-1.69
Gamma bait	0.51	0.22	0.09	0.94
Gam g1 bait	0.15	17.02	-33.22	33.52
Gam g2 bait	268.84	534.40	-778.58	1316.25
p Intercept	-2327.04	6016.07	-14118.54	9464.45
p bait	-944.11	22047.16	-44156.54	42268.31
TOD	-1.00	0.34	-1.66	-0.33
TOD2	-96.82	0	-96.82	-96.82
TOD3	-0.39	0.24	-0.85	0.08
TOD4	-72.56	0	-72.56	-72.56
p ST1	-31.74	84.76	-197.87	134.39
p ST3	0.02	0.15	-0.27	0.31
p ST4	-1.76	0.23	-2.21	-1.32
p ST5	-1.46	0.85	-3.14	0.21
p ST6	-0.20	0.71	-1.59	1.19

Appendix 1.16. Beta estimates from my best fit model for adult male wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[2]

Parameter	Estimate	SE	LCI	UCI
p g1	72.65	0	72.65	72.65
p g1 bait	-0.05	0.25	-0.54	0.45
p g1 ST1	-1.35	0.34	-2.01	-0.68
p g1 ST4	0.70	0.37	-0.03	1.43
p g1 ST5	0.51	0.34	-0.17	1.18
p g2	71.17	0	71.17	71.17
p g2 bait	-2.94	49.23	-99.42	93.55
p g2 ST1	-2.69	0.52	-3.71	-1.68
p g2 ST4	1.13	0.66	-0.16	2.41
p g2 ST5	0.52	0.77	-0.98	2.03
p g2 ST6	1.26	0.80	-0.30	2.82

[2]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. R- randomly selected site. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.17. Beta estimates from my best fit model for adult female wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[3]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-0.57	0.36	-1.28	0.13
Psi R	-1.60	0.47	-2.53	-0.68
Psi g1	-0.80	0.54	-1.85	0.26
Psi g2	0.21	0.56	-0.90	1.31
Epsilon Intercept	-0.21	0.34	-0.87	0.45
Eps R	1.49	0.54	0.42	2.55
Epsilon g1	-1.23	0.73	-2.66	0.20
Epsilon g2	0.25	0.49	-0.71	1.21
Gamma Intercept	-0.67	0.24	-1.15	-0.19
Gam R	-0.82	0.26	-1.33	-0.31
Gamma g1	-0.70	0.32	-1.33	-0.08
Gamma g2	-0.30	0.31	-0.90	0.30
p Intercept	-2.55	0.18	-2.90	-2.20
p bait	0.38	0.19	0	0.76
TOD	145.91	20.87	105.00	186.82
TOD2	-5590.92	703.38	-6969.54	-4212.30
TOD3	72198.80	8401.27	55732.31	88665.30
TOD4	-295042.90	32564.02	-358868.37	-231217.42
p ST1	-0.63	0.23	-1.07	-0.18
p ST3	-0.70	0.35	-1.38	-0.02
p ST4	-0.21	0.17	-0.54	0.11
p ST5	-0.84	0.39	-1.61	-0.08
p ST6	-0.56	0.20	-0.95	-0.17
p g1	0.17	0.10	-0.02	0.35
p g1 bait	-1.89	0.19	-2.27	-1.52
p g1 ST1	-0.41	0.51	-1.40	0.59

Appendix 1.17. Beta estimates from my best fit model for adult female wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[3]

Parameter	Estimate	SE	LCI	UCI
p g1 ST4	0.61	1.30	-1.94	3.15
p g1 ST5	-14.50	1896.14	-3730.94	3701.93
p g2	-0.40	0.20	-0.79	0
p g2 bait	-1.35	0.24	-1.81	-0.88
p g2 ST1	0.59	0.27	0.06	1.11
p g2 ST4	-0.14	0.36	-0.85	0.56
p g2 ST5	-164.83	0	-164.83	-164.83
p g2 ST6	0.12	0.50	-0.85	1.10

[3]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. R- randomly selected site. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.18. Beta estimates from my best fit model for total poults. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[4]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-2.28	0.54	-3.34	-1.23
Psi R	-1.44	1.11	-3.60	0.73
Psi g1	0.53	0.72	-0.87	1.94
Psi g2	-0.73	0.83	-2.36	0.89
Epsilon Intercept	-223.53	0	-223.53	-223.53
Eps R	0.68	1.04	-1.37	2.73
Epsilon g1	1.96	1.48	-0.95	4.86
Epsilon g2	374.43	46619.49	-90999.77	91748.63
Gamma Intercept	-2.58	2.34	-7.17	2.01
Gam R	-2.12	0.35	-2.80	-1.44
Gamma g1	-0.74	0.56	-1.85	0.36
Gamma g2	-765.56	0	-765.56	-765.56
p Intercept	-0.64	0.87	-2.35	1.08
p bait	-13.55	964.48	-1903.92	1876.82
TOD	766.42	0.00	766.42	766.42
TOD2	-1.22	0.20	-1.62	-0.83
TOD3	0.57	0.38	-0.17	1.31
TOD4	-62.72	24.17	-110.09	-15.34
p ST1	1386.36	826.17	-232.94	3005.65
p ST3	-7766.53	9901.07	-27172.62	11639.56
p ST4	-2285.55	38459.55	-77666.26	73095.17
p ST5	-0.88	0.36	-1.59	-0.17
p ST6	-1027.29	0	-1027.29	-1027.29
p g1	-1.42	0.75	-2.89	0.05
p g1 bait	-2.97	1.16	-5.24	-0.70
p g1 ST1	-1.10	0.48	-2.04	-0.16

Appendix 1.18. Beta estimates from my best fit model for total poults. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[4]

Parameter	Estimate	SE	LCI	UCI
p g1 ST4	-0.11	0.21	-0.52	0.29
p g1 ST5	-1.56	0.38	-2.30	-0.82
p g2	-73.71	0	-73.71	-73.71
p g2 bait	-230.84	36396.73	-71568.43	71106.76
p g2 ST1	-119.79	72349.73	-141925.25	141685.68
p g2 ST4	-1.01	0.39	-1.77	-0.24
p g2 ST5	-2.22	0.52	-3.25	-1.20
p g2 ST6	0.13	0.57	-0.99	1.25

[4]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. R- randomly selected site. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.19. Beta estimates from my best fit model for Poult 2 wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[5]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-32.75	16.17	-64.44	-1.07
Psi DOY	0.17	0.09	0	0.34
Psi g1	-5.59	2.58	-10.64	-0.54
Psi g2	-4.39	2.34	-8.97	0.19
Epsilon Intercept	-26.85	12.92	-52.18	-1.53
Epsilon DOY	0.13	0.06	0.02	0.25
Epsilon g1	-1.28	1.63	-4.48	1.92
Epsilon g2	0.71	1.65	-2.51	3.94
Gamma Intercept	6.96	7.33	-7.40	21.32
Gamma DOY	-0.05	0.03	-0.12	0.02
Gamma g1	-1.18	1.23	-3.59	1.23
Gamma g2	-1.02	1.05	-3.09	1.05
p Intercept	-1.49	0.35	-2.18	-0.81
p bait	0.17	0.49	-0.79	1.13
TOD	-61.32	40.65	-140.99	18.35
TOD2	1310.93	1384.39	-1402.48	4024.34
TOD3	-7200.87	16484.70	-39510.89	25109.15
TOD4	-2098.35	63529.52	-126616.21	122419.50
p ST1	0	0.40	-0.78	0.77
p ST3	-40.97	11691.86	-22957.02	22875.09
p ST4	-39.59	19416.33	-38095.60	38016.42
p ST5	-34.00	39664.13	-77775.70	77707.70
p ST6	-0.71	0.47	-1.63	0.21
p g1	-0.02	0.36	-0.73	0.70
p g1 bait	-1.08	0.49	-2.04	-0.12
p g1 ST1	-31.31	0	-31.31	-31.31

Appendix 1.19. Beta estimates from my best fit model for Poult 2 wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[5]

Parameter	Estimate	SE	LCI	UCI
p g1 ST4	1.07	974.67	-1909.28	1911.43
p g1 ST5	-0.35	1108.21	-2172.43	2171.74
p g2	-1.01	0.53	-2.04	0.02
p g2 bait	-4.02	0.83	-5.64	-2.40
p g2 ST1	-32.79	0	-32.79	-32.79
p g2 ST4	-2.40	0	-2.40	-2.40
p g2 ST5	-4.53	2520.90	-4945.50	4936.44
p g2 ST6	-65.02	0	-65.02	-65.02

[5]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. R- randomly selected site. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.20. Beta estimates from my best fit model for Poult 3 wild turkeys. Values of my beta estimate, standard error (SE), lower confidence interval (LCI) and upper confidence interval (UCI) are shown.[6]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-463.66	0	-463.66	-463.66
Psi g1	-134.79	0	-134.79	-134.79
Psi g2	459.37	0	459.37	459.37
Epsilon Intercept	-491.20	59.81	-608.42	-373.98
Epsilon g1	274.24	0	274.24	274.24
Epsilon g2	-163.20	0	-163.20	-163.20
Epsilon bait	492.28	59.81	375.06	609.50
Eps g1 bait	268.50	0	268.50	268.50
Eps g2 bait	620.20	0	620.20	620.20
Gamma Intercept	-2.31	0.29	-2.88	-1.74
Gamma g1	-0.87	0.51	-1.86	0.13
Gamma g2	-1.56	0.65	-2.84	-0.28
Gamma bait	-1.22	0.78	-2.74	0.31
Gam g1 bait	-527.48	0	-527.48	-527.48
Gam g2 bait	0.83	1.40	-1.91	3.58
p Intercept	-2.07	0.28	-2.61	-1.52
TOD	-3227.98	1407.67	-5987.02	-468.94
TOD2	54142.90	18489.57	17903.34	90382.45
TOD3	-263114.99	78313.76	-416609.97	-109620.01
TOD4	-0.02	0.22	-0.45	0.41
p g1	274.24	0	274.24	274.24
p g2	-2.31	0.29	-2.88	-1.74

[6]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges

near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.21. Beta estimates from my best fit *post hoc* model for all turkeys random site analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown. [7]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-0.42	0.33	-1.07	0.23
Psi R	-0.78	0.38	-1.52	-0.03
Psi g1	-0.18	0.45	-1.06	0.70
Psi g2	0.15	0.46	-0.76	1.05
Epsilon Intercept	-0.16	0.32	-0.80	0.47
Epsilon R	0.71	0.59	-0.44	1.86
Epsilon g1	-0.78	0.51	-1.78	0.21
Epsilon g1 R	-0.43	0.84	-2.08	1.22
Epsilon g2	-0.18	0.50	-1.16	0.80
Epsilon g2 R	0.27	0.85	-1.39	1.93
Gamma Intercept	-0.25	0.29	-0.82	0.32
Gamma R	-1.29	0.39	-2.05	-0.53
Gamma g1	0.44	0.42	-0.39	1.26
Gamma g1 R	-0.68	0.63	-1.92	0.56
Gamma g2	-0.86	0.48	-1.81	0.08
Gamma g2 R	1.11	0.63	-0.12	2.34
p Intercept	-2.66	0.16	-2.97	-2.35
p bait	0.29	0.12	0.05	0.52
TOD	166.66	18.03	131.33	202.00
TOD2	-6059.12	599.05	-7233.26	-4884.98
TOD3	76026.18	7086.88	62135.90	89916.45
TOD4	-305271.81	27263.69	-358708.64	-251834.98
p ST1	-0.54	0.17	-0.88	-0.20
p ST3	-0.82	0.35	-1.51	-0.13
p ST4	-0.35	0.13	-0.61	-0.10
ST5	-0.96	0.39	-1.73	-0.19

Appendix 1.21. Beta estimates from my best fit *post hoc* model for all turkeys random site analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown. [7]

Parameter	Estimate	SE	LCI	UCI
p g1	0.15	0.08	0	0.30
p g1 bait	-1.65	0.12	-1.90	-1.41
p g1 ST1	-1.13	0.40	-1.91	-0.34
p g1 ST4	-0.46	0.56	-1.56	0.63
p g1 ST5	0.43	1.01	-1.55	2.42
p g1 ST6	-153.81	68644.00	-134696.05	134388.44
p g2	-0.22	0.13	-0.47	0.04
p g2 bait	-1.01	0.16	-1.32	-0.70
p g2 ST1	0.33	0.20	-0.06	0.72
p g2 ST4	0.08	0.23	-0.38	0.54
p g2 ST5	-1.00	0.67	-2.30	0.31
p g2 ST6	-0.56	0.49	-1.51	0.40

[7]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.22. Beta estimates from my best fit *post hoc* model for adult female random site analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[8]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-0.45	0.39	-1.21	0.32
Psi R	-2.00	0.72	-3.41	-0.59
Psi g1	-1.06	0.64	-2.31	0.19
Psi g1 R	0.95	1.17	-1.36	3.25
Psi g2	0.00	0.70	-1.37	1.37
Psi g2 R	0.58	1.12	-1.62	2.79
Epsilon Intercept	-0.21	0.34	-0.87	0.44
Epsilon R	1.49	0.55	0.42	2.56
Epsilon g1	-1.27	0.75	-2.74	0.20
Epsilon g2	0.26	0.49	-0.70	1.22
Gamma Intercept	-0.67	0.24	-1.15	-0.19
Gamma R	-0.83	0.26	-1.34	-0.32
Gamma g1	-0.72	0.33	-1.36	-0.08
Gamma g2	-0.30	0.31	-0.90	0.31
p Intercept	-2.55	0.18	-2.90	-2.20
p bait	0.37	0.22	-0.06	0.79
TOD	145.91	20.86	105.02	186.80
TOD2	-5590.80	703.03	-6968.75	-4212.85
TOD3	72197.36	8397.15	55738.94	88655.77
TOD4	-295037.22	32548.28	-358831.85	-231242.59
p ST1	-0.63	0.23	-1.07	-0.18
p ST3	-0.70	0.35	-1.38	-0.02
p ST4	-0.21	0.17	-0.54	0.11
p ST5	-0.84	0.39	-1.61	-0.08
p ST6	-0.57	0.20	-0.96	-0.17
p g1	0.17	0.10	-0.02	0.35

Appendix 1.22. Beta estimates from my best fit *post hoc* model for adult female random site analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[8]

Parameter	Estimate	SE	LCI	UCI
p g1 bait	-1.89	0.19	-2.27	-1.52
p g1 ST1	-0.44	0.51	-1.44	0.56
p g1 ST4	0.43	2.10	-3.68	4.55
p g1 ST5	-378.11	237732.76	-466334.32	465578.11
p g2	-0.38	0.23	-0.82	0.06
p g2 bait	-1.33	0.26	-1.83	-0.83
p g2 ST1	0.59	0.27	0.06	1.11
p g2 ST4	-0.14	0.36	-0.84	0.57
p g2 ST5	-225.18	24689.05	-48615.71	48165.36
p g2 ST6	0.14	0.49	-0.83	1.10

[8]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.23. Beta estimates from my best fit *post hoc* model for adult female wild turkeys bait analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[9]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-0.46	0.39	-1.22	0.31
Psi R	-2.00	0.72	-3.41	-0.60
Psi g1	-1.12	0.63	-2.35	0.11
Psi g1 R	0.83	1.14	-1.41	3.07
Psi g2	0.31	0.81	-1.27	1.89
Psi g2 R	0.39	1.15	-1.87	2.65
Epsilon Intercept	0.55	0.51	-0.45	1.55
Epsilon R	1.23	0.52	0.20	2.25
Epsilon bait	-1.22	0.65	-2.49	0.04
Epsilon g1 bait	-0.96	1.09	-3.10	1.18
Epsilon g1	-0.34	0.78	-1.87	1.20
Epsilon g2	-0.62	0.97	-2.53	1.28
Epsilon g2 bait	1.35	1.15	-0.90	3.61
Gamma Intercept	-1.56	0.50	-2.54	-0.59
Gamma bait	1.18	0.52	0.15	2.20
Gamma R	-0.88	0.27	-1.41	-0.36
Gamma g1	-0.74	0.77	-2.24	0.77
Gamma g1 bait	0.16	0.83	-1.47	1.79
Gamma g2	1.41	0.70	0.04	2.79
Gamma g2 bait	-2.33	0.87	-4.04	-0.62
p Intercept	-2.55	0.18	-2.90	-2.20
p bait	0.63	0.18	0.28	0.98
TOD	145.98	21.40	104.03	187.93
TOD2	-5593.52	722.91	-7010.42	-4176.62
TOD3	72232.73	8637.00	55304.21	89161.25
TOD4	-295181.11	33466.35	-360775.15	-229587.06

Appendix 1.23. Beta estimates from my best fit *post hoc* model for adult female wild turkeys bait analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[9]

Parameter	Estimate	SE	LCI	UCI
p ST1	-0.63	0.23	-1.07	-0.18
p ST3	-0.68	0.34	-1.35	0
p ST4	-0.21	0.17	-0.54	0.11
p ST5	-0.85	0.40	-1.62	-0.07
p ST6	-0.57	0.20	-0.96	-0.18
p g1	0.16	0.10	-0.02	0.35
p g1 bait	-1.83	0.18	-2.18	-1.47
p g1 ST1	-0.52	0.49	-1.48	0.44
p g1 ST4	0.73	1.02	-1.28	2.74
p g1 ST5	-143.16	0.00	-143.16	-143.16
p g2	-0.65	0.19	-1.02	-0.27
p g2 bait	-1.57	0.22	-2.01	-1.13
p g2 ST1	0.59	0.27	0.07	1.11
p g2 ST4	-0.10	0.35	-0.77	0.58
p g2 ST5	-138.87	24807.81	-48762.18	48484.44
p g2 ST6	0.18	0.48	-0.76	1.12

[10]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.24. Beta estimates from my best fit *post hoc* model for adult male wild turkeys bait effect analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[10]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-2.69	0.52	-3.71	-1.68
Psi g1	1.11	0.66	-0.18	2.40
Psi g2	0.61	0.80	-0.95	2.18
Epsilon Intercept	0.91	0.84	-0.73	2.55
Epsilon g1	-1.70	0.98	-3.63	0.23
Epsilon g2	-0.34	1.11	-2.51	1.84
Epsilon bait	26.76	228.70	-421.49	475.01
Eps g1 bait	-25.60	228.70	-473.84	422.65
Eps g2 bait	-25.90	228.70	-474.16	422.36
Gamma Intercept	-2.25	0.32	-2.87	-1.63
Gamma g1	1.36	0.39	0.59	2.13
Gamma g2	0.06	0.49	-0.90	1.02
Gamma bait	-0.64	0.67	-1.96	0.68
Gam g1 bait	-0.62	0.95	-2.48	1.23
Gam g2 bait	0.52	1.03	-1.50	2.55
p Intercept	-2.08	0.20	-2.46	-1.69
p bait	0.59	0.25	0.10	1.07
TOD	0.14	15.82	-30.86	31.15
TOD2	268.93	490.80	-693.03	1230.90
TOD3	-2327.47	5513.25	-13133.43	8478.49
TOD4	-944.38	20232.97	-40601.00	38712.25
p ST1	-1.00	0.34	-1.66	-0.33
p ST3	-82.64	37102.29	-72803.13	72637.85
p ST4	-0.39	0.24	-0.85	0.08
p ST5	-56.90	0	-56.90	-56.90
p ST6	-31.18	0	-31.18	-31.18

Appendix 1.24. Beta estimates from my best fit *post hoc* model for adult male wild turkeys bait effect analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[10]

Parameter	Estimate	SE	LCI	UCI
p g1	0.02	0.15	-0.27	0.31
p g1 bait	-1.82	0.26	-2.32	-1.32
p g1 ST1	-1.41	0.86	-3.09	0.27
p g1 ST4	-0.11	0.71	-1.51	1.29
p g1 ST5	56.96	0	56.96	56.96
p g2	-0.12	0.28	-0.67	0.43
p g2 bait	-1.42	0.36	-2.12	-0.71
p g2 ST1	0.70	0.37	-0.03	1.43
p g2 ST4	0.51	0.34	-0.17	1.18
p g2 ST5	55.51	0	55.51	55.51
p g2 ST6	-3.67	0	-3.67	-3.67

[10]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.25. Beta estimates from my best fit *post hoc* model for total poults bait analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[11]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-2.28	0.54	-3.34	-1.23
Psi g1	-1.44	1.11	-3.60	0.73
Psi g2	0.53	0.72	-0.87	1.94
Epsilon Intercept	-0.73	0.83	-2.36	0.89
Epsilon g1	-223.53	0	-223.53	-223.53
Epsilon g2	0.68	1.04	-1.37	2.73
Epsilon bait	1.96	1.48	-0.95	4.86
Eps g1 bait	374.43	46619.49	-90999.77	91748.63
Eps g2 bait	-2.58	2.34	-7.17	2.01
Gamma Intercept	-2.12	0.35	-2.80	-1.44
Gamma g1	-0.74	0.56	-1.85	0.36
Gamma g2	-765.56	0	-765.56	-765.56
Gamma bait	-0.64	0.87	-2.35	1.08
Gam g1 bait	-13.55	964.48	-1903.92	1876.82
Gam g2 bait	766.42	0	766.42	766.42
p Intercept	-1.22	0.20	-1.62	-0.83
p bait	0.57	0.38	-0.17	1.31
TOD	-62.72	24.17	-110.09	-15.34
TOD2	1386.36	826.17	-232.94	3005.65
TOD3	-7766.53	9901.07	-27172.62	11639.56
TOD4	-2285.55	38459.55	-77666.26	73095.17
p ST1	-0.88	0.36	-1.59	-0.17
p ST3	-1027.29	0	-1027.29	-1027.29
p ST4	-1.42	0.75	-2.89	0.05
p ST5	-2.97	1.16	-5.24	-0.70
p ST6	-1.10	0.48	-2.04	-0.16

Appendix 1.25. Beta estimates from my best fit *post hoc* model for total poults bait analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[11]

Parameter	Estimate	SE	LCI	UCI
p g1	-0.11	0.21	-0.52	0.29
p g1 bait	-1.56	0.38	-2.30	-0.82
p g1 ST1	-73.71	0	-73.71	-73.71
p g1 ST4	-230.84	36396.73	-71568.43	71106.76
p g1 ST5	-119.79	72349.73	-141925.25	141685.68
p g2	-1.01	0.39	-1.77	-0.24
p g2 bait	-2.22	0.52	-3.25	-1.20
p g2 ST1	0.13	0.57	-0.99	1.25
p g2 ST4	-318.05	90219.84	-177148.94	176512.84
p g2 ST5	-232.18	0	-232.18	-232.18
p g2 ST6	-201.48	179579.25	-352176.81	351773.85

[11]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.26. Beta estimates from my best fit *post hoc* model for Poult 2 wild turkeys bait effect analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[12]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-25.86	11.60	-48.59	-3.13
Psi DOY	0.13	0.06	0.01	0.24
Psi g1	-3.07	1.46	-5.93	-0.21
Psi g2	-1.66	1.18	-3.97	0.65
Epsilon Intercept	-1384.12	18.87	-1421.11	-1347.13
Epsilon DOY	7.16	0.10	6.97	7.35
Epsilon bait	-155.63	27.87	-210.26	-101.00
Epsilon g1	-18.50	17149.05	-33630.64	33593.64
Epsilon g1 bait	-229.88	0	-229.88	-229.88
Epsilon g2	-1017.77	17.77	-1052.59	-982.94
Epsilon g2 bait	1175.80	17.70	1141.10	1210.49
Gamma Intercept	-45.23	60.84	-164.48	74.03
Gamma bait	52.56	59.98	-65.01	170.13
Gamma DOY	-0.05	0.05	-0.15	0.05
Gamma g1	46.49	57.36	-65.94	158.92
Gamma g1 bait	-47.23	57.36	-159.66	65.20
Gamma g2	51.21	60.00	-66.39	168.82
Gamma g2 bait	-52.22	60.00	-169.83	65.39
p Intercept	-1.50	0.35	-2.18	-0.81
p bait	0.27	0.46	-0.62	1.17
TOD	-60.58	40.61	-140.17	19.00
TOD2	1295.66	1380.58	-1410.28	4001.60
TOD3	-7118.91	16418.92	-39300.00	25062.18
TOD4	-2074.25	63205.49	-125957.02	121808.51
p ST1	0	0.39	-0.77	0.77
p ST3	-611.09	0	-611.09	-611.09

Appendix 1.26. Beta estimates from my best fit *post hoc* model for Poult 2 wild turkeys bait effect analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[12]

Parameter	Estimate	SE	LCI	UCI
p ST4	-110.06	0	-110.06	-110.06
p ST5	-288.66	0	-288.66	-288.66
p ST6	-0.71	0.47	-1.62	0.20
p g1	-0.02	0.36	-0.73	0.69
p g1 bait	-1.05	0.46	-1.94	-0.16
p g1 ST1	-268.77	0	-268.77	-268.77
p g1 ST4	3.09	0	3.09	3.09
p g1 ST5	-10.51	0	-10.51	-10.51
p g2	-1.11	0.49	-2.08	-0.14
p g2 bait	-3.12	0.85	-4.79	-1.45
p g2 ST1	-142.96	0	-142.96	-142.96
p g2 ST4	-3.27	0	-3.27	-3.27
p g2 ST5	-20.13	0	-20.13	-20.13
p g2 ST6	-285.57	0	-285.57	-285.57

[12]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts. ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.

Appendix 1.27. Beta estimates from my best fit *post hoc* model for Poult 3 wild turkeys bait effect analysis. Values of my beta estimates, standard error (SE), lower confidence intervals (LCI) and upper confidence interval (UCI) are shown.[13]

Parameter	Estimate	SE	LCI	UCI
Psi Intercept	-292.07	0	-292.07	-292.07
Psi g1	156.27	0	156.27	156.27
Psi g2	289.26	0.60	288.09	290.44
Epsilon Intercept	-88.46	261.06	-600.14	423.23
Epsilon g1	-70.72	0	-70.72	-70.72
Epsilon g2	-86.73	32086551.00	-62889727.00	62889554.00
Epsilon bait	89.57	261.06	-422.11	601.25
Eps g1 bait	97.49	0	97.49	97.49
Eps g2 bait	182.93	70700592.00	-138573000.00	138573300.00
Gamma Intercept	-2.05	0.31	-2.65	-1.45
Gamma g1	-1.23	0.69	-2.59	0.13
Gamma g2	-131.69	0	-131.69	-131.69
Gamma bait	-0.94	0.76	-2.43	0.55
Gam g1 bait	1.12	1.17	-1.17	3.40
Gam g2 bait	131.51	0	131.51	131.51
p Intercept	-1.41	0.23	-1.86	-0.96
TOD	-68.26	17.72	-102.98	-33.54
TOD2	1542.16	351.40	853.41	2230.90
TOD3	-8770.87	1904.64	-12503.97	-5037.78
TOD4	-2518.50	251.87	-3012.17	-2024.84
p g1	-0.13	0	-0.13	-0.13
p g2	76.97	0	76.97	76.97

[13]g1- Oakmulgee WMA. g2- Skyline WMA. Barbour WMA was the reference condition. DOY- day of the year that the camera was initially deployed. TOD4- quartic term for time of day. ST1- 2 track roads. ST2- ag fields. ST3- edges near clear cuts.

ST4- edges near openings/roads. ST5- firebreaks. ST6- forests. Wildlife openings served as the reference condition. Bait- bait was present during the time of the survey.