# IMPACTS OF INVASIVE WOODY VEGETATION ON SURVIVAL, NEST, AND BROOD ECOLOGY OF SCALED QUAIL (*CALLIPEPLA SQUAMATA*) IN THE SOUTHERN HIGH PLAINS OF TEXAS

by

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A thesis submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Master of Science
with a Major in Wildlife Ecology
August 2021

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## ACKNOWLEDGEMENTS

First and foremost, I want to thank Dr. Sarah Fritts for hiring me, as well as for all of her help and guidance on this project, and her ability to get me back on track when I lost my way. I would also like to thank Dr. Blake Grisham for his expertise and support, no matter the time of day. As well as Manuel Silva, who went through the fires of graduate school with me, and was always there for a mutual venting session. A special thanks to Rowdy White for his extensive quail knowledge and willingness to help no matter what. As well as John McLaughlin who provided me opportunities to share my research and always provided support. To the technicians that worked alongside me and helped me survive my field seasons with their humor and incredible attitudes, Jessica Watson and Rebecca Davis, words can’t express my gratitude to both of you. Thank you to Dr. Jennifer Jensen and Levi Heffelfinger, who endured multiple, frantic, emails from me begging for help with various analyses. Of course, I want to offer a huge thank you to my funders and landowners who made this project possible, Texas Parks and Wildlife, Texas State University, Texas Tech University, and the Quail-Tech Alliance, as well as the owner and employees of the ranch I conducted research on. Lastly, I want to thank my friends and family, who have offered their endless support and understanding, even though they usually had no clue what I was doing. I love all of you dearly and I could not have done this without all of you.

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## Introduction

### History

Scaled quail (*Callipepla squamata*) are a small game bird species that occur in the southwest region of the United States throughout Arizona, Texas, and Oklahoma and into Mexico (Williford et al. 2014). Scaled quail are also known as "cottontops" or blue quail due to the white tuft of feathers on their heads as well as their blue-grey feathers (Silvy et al. 2007). Scaled quail are popular amongst hunters and are known for being more of a challenge in comparison to northern bobwhites (*Colinus virginianus*) due to their tendencies of running from prey instead of flushing (Leopold 1959, Schemnitz 1961). Scaled quail diets primarily consist of seeds and insects during the spring and summer months, and grains and seeds during the fall and winter months (Schemnitz 1964, Burd 1989, Rollins 2000).

Scaled quail movements are largely concentrated between dawn and dusk depending on weather and time of year, with more frequent movements in midday hours during the breeding season (Schemnitz 1961, Silvy et al. 2007). Scaled quail select shortgrass landscapes with interspersed shrubs and overhead cover, which allow for easier movements and protection from predators (Schemnitz 1964, Rollins 1980). Although northern bobwhites and scaled quail exhibit dietary overlap (Schemnitz 1964, Rollins 1980), scaled quail generally considered hardier and slightly less resistant to dramatic population fluctuations in comparison to northern bobwhites (Schemnitz 1964, Rollins 1980) and frequently select different habitats. Male and female scaled quail form large groups, or coveys, in late September to October, ranging from 8 to 50 birds depending on geographic location (Wallmo 1956, Schemnitz 1961) and remain in coveys for the fall and winter months before dividing into pairs in March and April (Schemnitz 1961). Covey break-up marks the beginning of the breeding season, which can last until mid to late August (Schemnitz 1961). Depending on the time of year and time of day, scaled quail have been observed to select different cover types (Silvy et al. 2007). However, the Arizona subspecies, (*C. s. pallida*) which occurs in the Southern High Plains (hereafter "SHP") generally select the same habitats between the breeding and non-breeding seasons (Silvy et. al 2007).

Based on long-term roadside call counts performed by Texas Parks and Wildlife (TPWD), scaled quail numbers have been declining since the mid to late 1980's in the Rolling Plains and SHP of Texas. Rollins (2000) reported that northwest Texas as well as the Oklahoma panhandle have only "relic populations" since the early 1990's, meaning current scaled quail distributions are smaller and more fragmented than before. However, the Trans-Pecos and Edwards Plateau ecoregions have the greatest abundance of scaled quail according to 15-yr data trends in the TPWD Forecast. Although there is a considerable amount of literature on this species, much of their ecology, specifically nesting and brood ecology, is not well understood (Silvy et al. 2007). Scaled quail survival rates have been estimated to be between 15-70%, depending on the study region (Rollins 2000, Pleasant 2003, Kauffman 2019).

Scaled quail habitat use varies depending on the time of year and activity. Lotebush (*Ziziphus obtusfolia*), sandplum (*Prunus angustifolia*) thickets, and catclaw mimosa (*Mimosa biunciferae*) are important for loafing cover (Rollins 2000), whereas cholla cactus (*Cylindropuntia imbricate*) is sometimes used (Stormer 1981, Silvy et al.

2007). Some of the literature appears to be contradictory on the matter of mesquite (*Prosopis glandulosa*). For example, some studies state that mesquite is used by quail for escape cover (Schemnitz 1959, Griffing 1972), but it is suspected there is a composition threshold in which avoidance occurs (Rho 2015). On a broader scale, scaled quail tend to select less herbaceous cover and more open ground, (Schemnitz 1964, Rollins 2000). Scaled quail in the Rolling Plains and SHP  are more influenced by a decrease in grassland-herbaceous habitat and an aggregation of cropland-pasture habitat than scaled quail in South Texas (Rho et al. 2015); however, it is important to note that there are different subspecies between the two ecoregions, with *C. s. pallida* occurring in the SHP and *C. s. castanogastris* occurring in South Texas. Habitat selection of the two subspecies varies slightly, which should be accounted for in management recommendations (Silvy et al. 2007, Williford et al. 2014, Rho et al. 2015).

Previous literature suggests that several potential factors contribute to population declines, and although the factors are all likely working in conjunction, some factors are more critical than others (Bridges 2001, Pleasant et al. 2006, Rho et al. 2015). Weather is a highly influential factor contributing to population declines and influences all aspects of scaled quail ecology, especially reproduction (Bridges et al. 2001, Lusk et al. 2005). Similar to other Galliforme species (e.g., lesser prairie-chickens (*Tympanuchus pallidicinctus*)), temperature and precipitation likely are more accurate indicators of population abundance in dry versus wet ecological regions (Bridges et al. 2001, Grisham et al. 2016). Drought is specifically detrimental to scaled quail populations (Lusk et al. 2001, Reyna and Burggren 2012). The Palmer Drought Severity Index (PDSI) is one metric used to assess drought, with a value of +4 representing very wet conditions and -4 representing extremely dry conditions (Bridges et al. 2001, Fuchs 2012). PDSI calculations uses observations and estimations of precipitation, temperature, and soil water content to calculate drought metrics (NOAA 2019). There have been five major droughts in the SHP since the 1900s, the most severe (lowest PDSI of -6.39) beginning in 2010 and extending to 2015 (NOAA 2019). According to the United States Drought Monitor, the SHP experienced another shorter drought from 2018 to 2019 (NOAA 2019).

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## II. SURVIVAL, BREEDING, AND NEST ECOLOGY OF SCALED QUAIL HENS IN THE SOUTHERN HIGH PLAINS OF TEXAS

### Abstract

Scaled quail (*Callipepla squamata*) are a small game bird found in the western portions of the United States, ranging from Arizona and Oklahoma, across Texas, and into Mexico. Scaled quail are closely related to northern bobwhites (*Carolinus virginianus*), although they are generally considered a slightly hardier species and prefer more open, desert-grassland habitat. Scaled quail have been on the decline in various regions in Texas since the mid-1980s, and while researchers have identified multiple contributing factors, climate change, and habitat degradation and fragmentation due to human development have created added, unprecedented challenges to scaled quail management. Upland game bird research is increasingly focusing on invasive woody vegetation, specifically mesquite, and the impacts it has on populations and habitat suitability. Thus, understanding the specifics of how scaled quail interact with woody vegetation is vital as the landscape changes and becomes more fragmented. My study focused on breeding ecology of scaled quail and how they used invasive woody vegetation during the breeding season (March 15 – August 15). I calculated survival probabilities of scaled quail hens as well as nest survival probabilities of VHF and GPS-tagged hens using the nest survival model in program MARK (version 9.0). I quantified woody vegetation usage and landscape metrics in Fragstats (version 4.2) using aerial images collected with a drone and classified using ArcMap (version 10.7) and overlayed with core use areas and home ranges calculated from GPS-tagged hens. Invasive woody vegetation occurred in scaled quail core use areas and home ranges in the same proportion in which it occurred on the landscape. AIC*c* best models indicated a negative relationship with

woody vegetation in core use areas and hen survival (β = -0.77, SE: 0.39, 90% CI: -0.12±1.42), thus larger amounts of woody vegetation is potentially detrimental to scaled quail in their core use areas. Additionally, the AIC*c* best model included a positive relationship between percent grassland (β = 2.6, 90% CI: 4.5±0.68) in scaled quail hen home ranges. My findings suggest that scaled quail hens likely only select mesquite because it is available, and will ultimately select for non-invasive native grasses and vegetation more frequently if it is more available to them.

## Introduction

### Breeding Ecology

Scaled quail begin breeding in the Southern High Plains (SHP) in early March, with males beginning mating calls and displays during the dawn and dusk hours (Schemnitz 1961). Males and females generally begin pairing up between April and May with nesting attempts continuing from May to August (Schemnitz 1961, Tharp 1971). Average clutch size is 13–14 eggs, but ranges from 5–22 (Wallmo 1956, Schemnitz 1961, Tharp 1971). Pleasant (2003) estimated 55% and 64% nest survival probability in the SHP in 1999 and 2000, respectively. Nest survival probability in southern New Mexico was estimated by Kauffman et al. (2021) to be 39.1% across a 23-day incubation period (N= 39). . Hens are capable of re-nesting 2–3 times following nest failures (Schemnitz 1961, Campbell et al. 1973, Pleasant et al. 2006, Silvy et al. 2007). Nest success and failure rely heavily on several factors including weather patterns, vegetation composition at the landscape and patch levels, and predator abundance (Guthery et al. 1988, Chalfoun et al. 2002, Pleasant et al. 2006, Rho et al. 2015, Carroll et al. 2018).

Precipitation and temperature influence nest success and subsequent egg and chick survival both directly and indirectly. Average precipitation in the SHP is 40–56 cm (Texas Parks and Wildlife Ecoregions), with precipitation peaking in May and September. Summer rainfall promotes grass and forb production directly, which increases potential nesting cover (Campbell et al. 1973). However, severe storms that produce hail has been demonstrated to destroy nests and eggs (Higgins and Johnson 1978, Carver et al. 2017). High levels of moisture and humidity allows for microbial growth around the nest and subsequently may raise the risks for predation due to increased chances of scent detection (Pleasant et al. 2003), supporting the moisture-facilitated nest depredation hypothesis. Conversely, inadequate amounts of precipitation pose risks as well, as it is typically accompanied by vegetation die-off and higher temperatures (Guthery et al. 1988, Briggs and Knapp 1995). Apart from nesting cover, certain vegetation types are important for diet during nesting and brooding. For example, forbs are an important component of breeding quail diets (Campbell et al. 1973). Greater quantities of forbs generally lead to greater numbers of invertebrates, which are a vital part of chick diets (Orange 2015). High temperatures and inadequate rainfall at the beginning of the nesting season could potentially result in a loss of forbs early on, reducing the number of invertebrates, leading to lower chick survival overall (Hurst 1972, Taylor and Guthery 1994).

Sustained high temperatures that typically occur with drought affect scaled quail reproduction by decreasing adult survival and nest success and results in smaller clutch sizes (Lusk et al. 2001, Carey 2009, Tri et al. 2013). Continued temperatures at or above 40° C drastically increase adult and chick mortality in northern bobwhites, as these temperatures are fatal to embryos and can cause hyperthermia in adults (Guthery et al. 2005, Reyna and Burggren 2012). Nest success is affected by prolonged high temperatures, as the optimal egg incubation temperature for domestic chickens is approximately 37.5° C (Wilson et al. 1979). However, northern bobwhite eggs have retained viability (1>hr) at temperatures of 45° C (Reyna 2010, Reyna and Burggren 2012). Summer temperatures in the SHP average between 31° C and 35° C; however, temperatures can increase to above 41° C (US Climate Data 2020). High temperatures can strain hens as they expend energy attempting to regulate body temperature (Reyna 2010, Reyna and Burggren 2012), and the combination of increased energy expenditure and added stress of egg production can result in decreases in all reproductive processes (Guthery et al. 2001, Carey 2009, Reyna and Burggren 2012).

Both vegetation composition and structure are important for nesting. Hens commonly nest in yucca (*Yucca* spp.), various species of bunchgrass (*Andropogon* spp), prickly pear (*Opuntia* spp.), mesquite (*Prosopis glandulosa*), sand sagebrush (*Artemisia filifolia*), catclaw acacia (*Senegalia greggii*) and cholla (*Cylindropuntia imbricate*) (Pleasant et al. 2006, Silvy et al. 2007). However, regardless of species, nest site selection likely relies heavily on visual obstruction, (up to 1 m being optimal), paired with low percentages of bare ground (Pleasant et al. 2006)

Focusing on changes in landscape composition is critical in scaled quail habitat management, especially woody vegetation encroachment and habitat fragmentation due to historical and current agricultural practices and climate change (Wilcox et al. 2012, Rho et al. 2015). Historical stocking densities in the SHP exhibited a sharp increase in the mid 1930s, a decrease in the 1940s, leveled out in the 1960s (~60% below peak) and have remained largely unchanged since (Wilcox et al. 2012, Rho et al. 2015). Larger scaled quail populations correlate with habitat that is comprised of larger patches of grassland and lower percentages of pasture-cropland (Bridges et al. 2002, Rho et al. 2015). Larger, more stable, populations are generally less susceptible to large-scale changes due to drought; whereas smaller, more intermittent, populations generally exhibit more changes due to weather (Lusk et al. 2002). Population changes are apparent during drought conditions (Lusk et al. 2002, Tri et al. 2013), and droughts are becoming more frequent and of higher magnitude in the SHP with climate change (South Central Climate Science Center 2018, NOAA 2019).

Woody vegetation (mesquite, *Prosopis spp.*) encroachment began in Texas alongside the introduction of cattle grazing in the region, as early cattle ranchers supplemented feed with mesquite pods during long, northern cattle drives (Ellsworth et al. 2018). It has been estimated that mesquite encroachment has reduced the value of approximately 22 million ha of the 70 million ha of land in Texas (Ellsworth 2018). Mesquite trees are a highly invasive, hardy, nitrogen-fixing species, meaning they can improve the soil quality around their roots, and have been used in some countries to combat desertification (Shackleton et al. 2014, Ellsworth et al. 2018). However, mesquite can seriously damage the surrounding rangeland by competing with non-invasive vegetation for water, due to their deep root systems and high water demand (Canadell et al. 1996, Texas State Soil and Water Conservation Board (TSSWCB) 2017).

Mesquite roots can grow as deep as 50 m and cover a surface upwards of 15 m in circumference, which aids in competition with other native vegetation for soil moisture (Canadell et al. 1996, Ellsworth et al. 2018). Honey mesquite, which is the primary species on my study site, has been known to reach heights upwards of 7.6 m tall, and a trunk diameter of 0.6 m (Ellsworth et al. 2018). A study conducted on the soil respiration levels around mesquite trees in the Sonoran desert determined that levels were higher around large mesquite trees (>3 m tall), in comparison to medium mesquite trees (1.5 to 3 m tall) (Cable et al. 2012). However, medium mesquite trees had respiration levels that were similar to surrounding grassland species (Cable et al. 2015). As soil respiration levels increase with increasing temperature (Kirschbaum 1995), it can be assumed that this would affect the surrounding microclimate underneath mesquite trees. Although grasses and medium sized mesquite trees have shown to have similar rates of respiration, and theoretically higher ground temperature conditions, grass species may provide more airflow than mesquite trees (Cable et al. 2012, Hovick et al. 2014).

The overall goal of my project was to assess the influences of woody vegetation (defined as mesquite) encroachment on various aspects of scaled quail breeding and brood ecology. My objectives were to: 1) estimate survival of hens and nest success; 2) assess the influence of temperature and vegetation composition on nest survival; 3) examine the influence of temperature and vegetation composition and structure on nest site selection (third-order selection, Krausman 1999); and 4) quantify the percent composition of woody cover at nest sites (second-order selection, Krausman 1999). Additionally, I assessed the relationships between weather variability and vegetation composition and structure on nest success (Guthery et al. 1988, Pleasant et al. 2006). I hypothesized that adult and nest survival rates would be positively related to lower temperatures at nest sites as well as a lower percentage of woody cover (Carey et al. 2009, Reyna and Burggren 2012, Rho et al. 2015). I hypothesized that nest survival would correlate with vegetation types that offer the coolest temperatures and thermal cover due to the maximum temperature threshold of incubating eggs, such as native grasses and non-invasive shrubs (Lusk et al. 2001, Pleasant et al. 2006, Reyna 2010, Hovick et al. 2014). Finally, I hypothesized that hens would select areas with lower percentage of woody vegetation surrounding nest sites and greater percentages of vegetation offering cooler temperatures and cover (Lusk et al. 2002, Rho et al. 2015).

## Methods

### Study Site

I monitored scaled quail on a ranch in Potter County, Texas (Figure 1), it is a working cattle ranch and supported several large herds of beef cattle that were occasionally rotated between pastures, as well as a herd of horses. The ranch was also used for oil production and hunting. Additionally, there is an active supplemental feeding program with approximately 180 quail feeders scattered across the ranch, and feed is periodically broadcasted along the ranch roads. The ranch is in the SHP ecoregion, which is characterized by a semi-arid climate, and has been collaborating with the Quail-Tech Alliance at Texas Tech University and participating in spring call counts since 2010. The average yearly rainfall is approximately 40–56 cm, and the primary soil types vary from clay to sand with caliche underlying the surface soils. (Texas Parks and Wildlife Department Ecoregions).

According to Texas Parks and Wildlife Department, the SHP is largely comprised of shortgrass prairie or mesquite grassland, with native grasses including sideoats grama (*Bouteloua* curtipendula), blue grama (*Bouteloua* gracilis), hairy grama (*Bouteloua* *hirsuta*), and buffalo grass (*Bouteloua* dactyloides). The region also supports forbs, legumes, and woody species, which include redberry juniper (*Juniperus pinchotii*), yucca (*Yucca* spp.), mesquite (*Prosopis glandulosa*), sand shinnery oak (*Quercus havardii*), lotebush (*Ziziphus obtusifolia*), hackberry (*Celtis occidentalis*), prickly pear *(Opuntia* spp.), skunkbush sumac (*Rhus trilobata*), plum (*Prunus* spp.), and catclaw acacia (*Acacia greggii*), among many others. Much of the region has been influenced by agriculture and ranching, with cropland averaging between 30%–60% of the landscape (Texas Parks and Wildlife Ecoregions).

**Capture, Tagging, and Monitoring Methods**

I began sampling scaled quail hens in early April of the 2019 season and mid-May during the 2020 season under the authority of Texas Parks and Wildlife Department Scientific Collecting Permit #SPR-1217–243. My goal was to maintain 20 radio-tagged individuals at all times for both field seasons. I sampled birds using walk-in funnel traps (Smith et al. 1981) baited with milo and covered with available surrounding vegetation. I set traps before sunrise, checked them mid-day and again at sundown. I released all non-target species captures immediately. After birds were removed from traps, I placed them into mesh bird bags for a maximum of 30 minutes during processing. I applied aluminum butt-end leg bands (National Band and Tag Co., Newport, Kentucky, No. 8 bands) on the left leg of each bird. I determined gender based on presence or absence of streaking on the throat (Wallmo 1956). In addition, I recorded weight, age, trap number, and location of each capture. I then placed 6-gram necklace style VHF radio-transmitters with an 11-month lifespan (American Wildlife Enterprises, Monticello, Florida) on all hens captured. I began searching for nests starting from May 15 to August 15 during both field seasons and determined nest locations using VHF radio-telemetry. I monitored nests every three days until the clutch hatched, or the nest was abandoned or predated. I followed nest detection methods used by Pleasant et al. (2006), homing in on the hen and circling around until she either flushed, or by returning to the same location during the subsequent check. When I ascertained whether the hen was nesting, I returned during the dawn or dusk hours when she was out foraging to establish the presence of the nest and determine clutch size.

**Nest Site Selection Characteristics**

I deployed two Ibutton dataloggers (hereafter "ibuttons") (Maxim Integrated Products, Sunnyville, California, USA) at the substrate at the edge of the nest and two at a random location 5 m outside the nest to assess effects of microclimate on nest survival probability and nest site selection. Random locations were selected using a random number generator to select a direction between 0 and 360 degrees. Ibuttons recorded temperature every 30 minutes and remained at the nest location for at least two weeks, or until nest fate was determined (Grisham et al. 2016). Vegetation characteristics at nest sites were determined by conducting vegetation surveys at nest sites and paired random locations between 15 and 360 m away. I estimated stems per hectare and visual obstruction of grass and shrubs, separately using a robel pole (Robel et al. 1970). I assessed species composition using a Daubenmire frame at the nest bowl at 1 m, 5 m, 10 m, and 15 m in each cardinal direction, separating each type into 5 classes (litter, grass, forb, bare ground, shrub)  noting litter height and tallest plant, as well as species of shrub and woody vegetation encountered (Daubenmire 1959). I gathered overall woody vegetation inventory within a 50 m radius from the nest bowl. All nest sites and random paired locations were examined within 3–4 days after the nest failed or succeeded.

### Hen Survival and Nest Success

Hens were tracked every three days from May to August 15, and once they began nesting, I recaptured previously tagged birds at night using VHF telemetry and a hand net. I replaced the VHF necklaces with Ecotone PICA 5.5-gram rechargeable GPS backpack style transmitters (Ecotone Telemetry, Gdynia, Poland) with a 2-gram "piggy-back" VHF transmitter glued onto the side of each unit (Advanced Telemetry Systems, Isanti, Minnesota). GPS units were deployed on each hen for two weeks, and collected data every 30 minutes, which allowed for estimation of the home range of each hen. At the end of the two-week period, I recaptured the birds at night with the same methods mentioned above, replaced the GPS backpacks with VHF collars, and immediately downloaded the data from the GPS loggers. I continued monitoring each hen throughout the season and recorded all nesting attempts. Upon each subsequent success, I continued tracking the hens with broods weekly to verify chick survival.

### Home Range and Woody Vegetation Usage

I flew a Sensefly Ebee mapping drone with a S.O.D.A. (Sensor Optimized for Drone Applications) camera (Sensefly SA, Cheseaux-Lausanne, Switzerland) that acquired RGB (Red, Green, and Blue) imagery and measured spectral wavelengths between 400 – 1,000 (RGB wavelength intervals). Drone flights were Programmed using Sensefly eMotion3, mapped out to ensure they covered all GPS-recorded hen locations. I created orthomosaic images from the drone photos which were used to delineate landcover for each hen home range for landscape level habitat metrics to be included in habitat selection and survival models. The drone provided a great advantage over using free satellite imagery because imagery alone can become outdated quickly. Leaf loss in deciduous woody cover and grazing of herbaceous cover can quickly change habitat structure. Thus, basing habitat selection studies for this specific habitat on outdated imagery could bias conclusions due to the time lag between selection and when image data for the area was acquired. Additionally, I collected weather data from the West Texas Mesonet which has stations located near each ranch and provides detailed, long term weather data.

## Statistical Analysis

### Nest Site Selection Characteristics

I evaluated microclimate conditions at both nest sites and at random locations using Proc Means in SAS (version 9.3) (Grisham et al. 2016). I calculated summary statistics for temperature collected by the ibuttons which were grouped together by used vs random sites. I compared empirical distribution functions of nest temperature between used versus random. Empirical distribution functions are defined as the distribution of the cumulative data points in the sample and converge to a probability of 1 (Zar 2010). I used the Kolmogorov-Smirnov test to determine differences in empirical distribution functions for temperature and among each comparison (Grisham et al. 2016).

For all comparisons I did pairwise comparisons for each objective using a 2-sample Kuiper statistic in PROC NPAR1WAY in SAS (version 9.3) and reported the Kuiper statistic (K), Kolmogorov-Smirnov test statistic (KSa) and critical value (KS), maximized difference (MD), and percentage of observations that fell to the left of the MD for temperature (Grisham et al. 2016). The MD was defined as the value that maximized differences in the empirical distribution functions between parameters. Cooler distribution functions are characterized by a larger proportion of observations that fall to the left of the MD, whereas warmer distribution functions are characterized by larger proportions of observations on the right side of the MD (Grisham et al. 2016).

I evaluated nest site selection in Program R using a logistic regression with multiple covariates. The response variable was hen nest site and paired random locations (1 = used nest site; 0 = random), and the covariates were main vegetation type, visual obstruction (VOR), measurements of ground cover types (percent bare ground, grass, forbs, shrubs, litter, and mesquite – recorded as exotic species) estimated from the Daubenmire frame measurements, temperature (mean and maximum and number of 30-minute increments ≥45° C) (Reyna and Burggren 2012). To create variables using the vegetation data I conducted several transformations.

I averaged 100% VOR among four cardinal directions for each interval, but not among intervals (point center, 1 m, 5 m, 10 m, 15 m) and focused on VOR measurements at the 0 and 100 percent, as studies have demonstrated these to be the most influential vegetation heights for grassland birds (Grisham et al. 2016). I then log-transformed both VOR values. I averaged canopy cover percent among four cardinal directions for each category (litter, grass, shrubs, bare ground, forbs) for each interval, but not among intervals (point center, 1 m, 5 m, 10 m, 15 m) and then divided each canopy cover value within categories by 100 and lastly arcsine transformed. I then scaled each variable by subtracting the mean and dividing by the standard deviation. I used the vegetation and temperature variables as independent continuous covariates.

Before constructing models, I used variance inflation factors to assess collinearity among independent variables and dropped a covariate from the model if the factor was >3 (Zuur et al. 2009). I selected models *a priori* to examine the influence of variables on habitat use. I separately conducted models that combined vegetation structure at each measured distance from the point (e.g., all vegetation types at point center), models with each vegetation structure type at each distance from the point (e.g., shrubs at point center, 1 m, 5 m, 10 m, 15 m together), and models that combined vegetation and weather covariates.

I compared models using Akaike's Information Criterion (AIC*c*) and averaged models within Δ4 AIC*c* from the AIC*c* top model. I assessed model fit of all averaged models by comparing each model with a null model using an analysis of variance. I evaluated the significance of each variable by omitting variables with 90$^{th}$ confidence intervals that included 0.

**Hen Survival and Nest Success**

I estimated hen survival using the nest survival model in Program MARK (Version 9.0), as the exact date of death was not known (White and Burnham 1999, Cooch and White 2020). The response variable was biweekly survival (1 = survived; 0 = failed) which was collected using both VHF and GPS transmitters. I tested for multicollinearity using the Pearson's coefficient test (r<1) and all variables were automatically scaled in Program MARK. My covariates were transmitter type (VHF, GPS, or both), hen mass, number of days where the ambient temperature ≥40° C (Guthery et al. 2005, West Texas Mesonet), percentage and total area (ha) of each landcover type (yucca, cholla, grassland, herbaceous shrub, bare ground, woody vegetation, and structures), as well as largest patch index in each individual hen's calculated home range (90% isopleth) and core use area (50% isopleth). Largest patch index (%) represents the most to least fragmented class types (McGarigal and Marks 1995).

I developed several *a priori* models to assess nest survival probability and evaluated the model set using the logit-link function in the nest survival model in Program MARK. I based scaled quail nest survival probability candidate models on previous studies of scaled quail as well as incorporated temperature and habitat data collected at the nest. I assessed the effects of various factors on nest survival probability such as: vegetation type (yucca, prickly pear, bunchgrass, mesquite, catclaw acacia, and cholla), visual obstruction, microclimate temperature collected from ibuttons (mean, maximum, and number of 30-minute increments ≥45° C) (Reyna and Burggren 2012, Grisham et al. 2016), precipitation using data recorded by the West Texas Mesonet, and percentage of woody vegetation within a 50 m radius of the nest. I used an information-theoretic approach and AIC*c* and selected the model with the lowest AIC*c* and evaluated the effect of each covariate on nest survival probability (Burnham and Anderson 2002).

**Home Range and Woody Vegetation Composition**

I estimated hen home range size and habitat selection using the data from the GPS backpacks in conjunction with the drone imagery and vegetation surveys to assess percent composition of woody vegetation in both used and random nesting habitat. I used the Brownian Bridge Movement Model in Program R (Horne et al. 2007, Walter and Fischer 2016) to define home range (90% contours) and core use areas (50% contours). The approximate positional error of the GPS units was 25.42 m (R. White personal communication). I used the drone images to assess percent composition of woody vegetation across used and random home ranges. Random home ranges were generated in ArcGIS Pro (version 2.7.2) using the generate random point tool. I created a 57-ha buffer around each point, which was the average home range size.

Pre-processing was done using Pix4Dmapper (Prilly, Switzerland) to stitch drone photos together to create orthomosaics. This involved an automatic, 3-step process that starts with initial processing, which includes keypoint extraction and matching, camera model optimization, and geolocation, as well as creation of tie points. The second step is the creation of densified point cloud and 3D textured mesh. The third step is the creation of the digital surface model (DSM), orthomosaic, and reflectance map. Orthomosaics were imported into ArcMap (version 10.7) and classified using the classification wizard. This process included creation of training samples using 6 different classes, cholla, yucca, bare ground, herbaceous shrub (primarily skunkbush and sand sagebrush), grassland, structures (man-made), and woody veg (mesquite). Classes were chosen based on previous scaled quail habitat use research and field observations, with an emphasis on woody vegetation (mesquite) classification. The cases in which classes needed to be combined to increase accuracy, cholla, yucca, and grassland were grouped into one class and labeled succulents/grassland. This occurred with images where the spectral signatures of succulent species (cholla and yucca) were similar to grassland, either due to original image quality or time of day of the flight. Training samples were then used to produce a signature file, which was used to classify the images using the maximum likelihood classification method. The resulting classified images had to be resampled using the majority resampling technique in ArcMap to increase the pixel sizes to 3x3 and reduce the file size to be imported into Fragstats (version 4.2).

I conducted accuracy assessments of each classified image by calculating confusion matrices, which were created in Microsoft Excel. For each confusion matrix I calculated the overall *kappa* and conditional *kappa* which illustrated the percent of data that are reliable and the level of agreement on a scale of 0 to 1. I also calculated producer's and user's accuracy, which represent the commission and omission errors, respectively. Commission error is the value assigned based on the amount of misclassification into each specific class. Omission error represents false negatives and represent the value in each class that were incorrectly predicted to be in a different class. Once I obtained an overall accuracy of at least 50% I exported all raster images as tif files into Fragstats and calculated class area (CA), percent land cover (PLAND), largest patch index (LPI), and edge density (ED).

I compared the differences between used and random home ranges using logistic regression with the covariates being metrics calculated in Fragstats (version 4.2). The response variable was hen home range and the 50 random locations (1 = used hen home range; 0 = random), and the covariates were CA, PLAND, LPI, and ED. Before conducting models, I used variance inflation factors to assess collinearity among independent variables and dropped a covariate from the model if the factor was >3 (Zuur et al. 2009). I compared competing models using AIC*c* and averaged models within Δ4 AIC*c* from the top model. I assessed model fit of all averaged models by comparing each model with a null model using an analysis of variance. I evaluated the significance of each variable by omitting variables with 90$^{th}$ confidence intervals that included 0. Additionally, I assessed the same metrics listed above at the ranch level, which was defined by all the orthomosaics combined.

## Results

### Nest Site Selection Characteristics

I collected temperature recordings from 38 nests and random sites across the 2019 and 2020 seasons, resulting in a total of 50,002 recordings (Table 3). Empirical distribution functions of temperature between used and random sites were significantly different; 87% of temperature recordings at nest sites and 61% of recordings at random sites fell to the left of the MD (39° C) (Figure 2) The KS value was 0.13, KSa was 29, and K was 0.26. Mean temperatures were lower at nest sites versus random sites (Figure 2), whereas maximum temperatures at nest sites were approximately 9° C cooler than random, 41° C versus 50° C, respectively. Temperatures were normally distributed at nest site, with the most frequent temperatures occurring at approximately 35° C (Figure 3). Temperatures at random sites exhibited a bimodal distribution, which I suspect was due to the random placement of ibuttons. The most frequently occurring temperatures at random sites occurred at approximately 25° C and 45° C (Figure 3). Additionally, I calculated an average of 58 minutes where temperature at the nest bowl exceeded 45° C in 2019, and an average of 146 minutes in 2020, indicating significantly warmer temperatures the second year.

I assessed nest site characteristics at 38 nests across the 2019 and 2020 field seasons (Table 4, 5). The most frequently selected vegetation types selected for nests was yucca (50%) and cholla (29%). Based on the top model from the logistic regression (Table 6), scaled quail hens select for nest sites with less litter ($\beta$ = -2.14, SE = 1.09, 90% CI: -3.93, -0.34), forbs ($\beta$ = -2.97, SE = 1.37, 90% CI: -5.22, -0.71), and bare ground ($\beta$ = -3.39, SE = 1.74, 90% CI: -6.24, -0.53) (Figure 4). Additionally, there was a positive relationship between maximum temperatures at nest sites and litter cover (Figure 5), forb cover (Figure 6), and bare ground (Figure 7).

**Hen Survival and Nest Success**

I captured a total of 43 hens across the 2019-2020 field seasons, 25 in 2019 and 18 in 2020. 20 hens were equipped with both a GPS and VHF transmitter, and 23 with only a VHF transmitter. The majority of radio-tagged females made at least one nest attempt, resulting in a total of 39 nest attempts across both seasons. I documented 11 second nest attempts and 3 third nest attempts. I considered the nest a success if at least one chick was with the hen on the day the nest was found to be hatched out.

I tested 19 candidate models (N= 37) and my top model indicated that hen survival was different between years (Table 1, Figure 8). I calculated daily hen survival at 99% in 2019 (SE: 0.002; 90% CI: 0.998, 0.99) and 97% in 2020 (SE: 0.01; 90% CI: 0.99, 0.95. Probability that a hen would survive to the end of the season (133 days) was 51% in 2019 (SE: 0.13, 90% CI: 0.72, 0.30) and 1% in 2020 (SE: 0.02, 90% CI: 0.04, -0.02). The top model ($\Delta AIC_c$ <2) indicated that number of hot days ($\beta$ = 0.89, SE: 0.27, 90% CI: 1.33, 0.45) was positively associated with hen survival. Hot days were defined as the number of days the ambient temperature exceeded 40° C (West Texas Mesonet).

While the top model contained the majority of the weight, the second to top model indicated there was a negative relationship between total area of woody vegetation in core areas and hen survival (β = -0.77, SE: 0.39, 90% CI: -0.12, -1.42) (Table 1).

I compared 10 candidate models (N= 38) between the two years to quantify nest survival probability and my top model indicated that nest survival was varied between years (Table 2, Figure 9). The daily nest survival rate was 97% in 2019 (SE: 0.007, 90% CI: 0.98, 0.96), and 95% in 2020 (SE: 0.01, 90% CI: 0.97, 0.93; Table 2). Probability that a nest would survive the incubation period (23 days) was 5% (SE: 0.04, 90% CI: 0.12, -0.02) in 2019, and >1% (SE: 0.02, 90% CI: 0.01, -0.005) in 2020. I had several competitive models ($\Delta AIC_c$ <2), the top model contained no additional covariates other than different year, the second model was the null (Table 2), the third included main vegetation type the nest was built under (β = -0.08, SE: 0.85, 90% CI: 0.06, -0.2) and the fourth competing model included the number of hot days (β = 0.04, SE: 0.05, 90% CI: 0.13, -0.04); however, covariate confidence intervals overlapped '0'.

**Home Range and Woody Vegetation Composition**

I flew the drone for approximately 5 hours and 48 minutes at an altitude between 119 and 160 meters and captured approximately 5,000 images from 8 flights between both years. Drone flights for the 2019 season were conducted on August 10 between 1000 hrs and 1500 hrs, separated into 3 different missions. Flights for the 2020 season were conducted August 8 – 14 between 1000 hrs and 1500 hrs, separated into 5 different missions. I assessed the accuracy of each of my classified rasters using confusion matrices calculated in Excel. Overall classification accuracy ranged between approximately 56-86% (Table 8). Class specific accuracies ranged from poor to perfect

(11 % to 100%) (Table 8), producer's accuracy for cholla ranged between 23% to 94% (average 57%), user's accuracy ranged between 40% to 81% (average 55%). Producer's accuracy for yucca ranged between 50% to 90% (average 74%), user's accuracy ranged between 50% to 57% (average 55%). Producer's accuracy for succulents/grassland was 80%, user's accuracy ranged between 68% to 75% (average 71%). Producer's accuracy for bare ground ranged between 56% to 96% (average 88%), user's accuracy ranged between 88% to 100% (average 99%). Producer's accuracy for herbaceous shrub ranged between 12% to 73% (39%), user's accuracy ranged between 29% to 74% (average 55%). Producer's accuracy for grassland ranged between 31% to 73% (average 52%), user's accuracy ranged between 26% to 81% (average 49%). Producer's accuracy for woody vegetation ranged between 39% to 90% (average 68%), user's accuracy ranged between 51% to 89% (average 73%). Producer's accuracy for structures was 65% and user's accuracy was 68%. Kappa coefficient of agreement statistics ranged between 0.477 to 0.643 and average 0.559. indicating a moderate agreement amongst all of the classified images (Table 8, Figure 10).

I calculated 19 hen home ranges and determined an average size of 57 ha, with the largest being 192 ha and the smallest being 22 ha (Figure 11) (second-order selection, Krausman 1999). Two home ranges were removed from the land cover analysis because they were outside of the classified raster images. Home range and core use areas were larger in 2019 (N= 8) versus 2020 (N=11), at 71 and 12 ha and 55 and 9 ha, respectively (Figure 12). Woody vegetation averaged at 1.5% (0.8 ha) at the home range scale and 3% (0.3 ha) in core use areas (Table 9, 10). The largest percentage of landcover type was the succulent/grassland class at an average of 81% (75 ha) in home ranges and 79% (8 ha) in core use areas, followed by 11% (6 ha) and 10% (1 ha) bare ground, 3% (2 ha) and 3% (0.4 ha) herbaceous shrub, and 0.8% (1 and 0.1 ha) structures (Table 9). Largest patch indexes occurred in the succulent/grassland categories in both the core use areas and home ranges, 74% of core use areas and 76% of home ranges (Table 11). Edge density averaged at 673 ha in core use areas and ranged from 79 ha to 1,359 ha, home ranges had an average edge density of 582 ha and ranged from 89 ha to 1,238 ha (Table 12) (third-order selection, Krausman 1999).

Among the 50 (57 ha) randomly calculated home ranges, woody vegetation averaged at 1% (0.3 ha) (Table 13, 14). The succulent/grassland class type averaged at 85%, 8% bare ground, 3% herbaceous shrub, and 0.2% structures (Table 13, 14). Average edge density was 809 ha and ranged between 346 ha and 1332 ha (Table 16). For the used and random home range analysis, I tested 9 candidate models, and my top model indicated that percent grass ($\beta = 2.6$, 90% CI: 4.5, 0.68), largest patch index (grass) ($\beta = -3.2$, 90% CI: -1.24, -5.13), and edge density (grass) ($\beta = -0.74$, 90% CI: -0.08, -1.40) were all statistically different between used and random home ranges. At the ranch level, which was defined as all the raster images combined, woody vegetation averaged at 1.4% across 1,045 ha, with 77% succulents/grassland, 25% herbaceous shrub, 6% bare ground, and 0.3% structures. Total edge was calculated at 6,448,302 m (first-order selection).

# Discussion

## Nest Site Selection Characteristics

My assessment of microclimate conditions at nest sites indicated that scaled quail hens select for cooler sites to build nests, which aligns with previous research on nest site characteristics (Reyna 2010, Carroll et al. 2018, Belnap et al. 2019). Hen nest site selection was negatively related to amounts of litter, forbs, and bare ground in my study, all of which can contribute to higher temperatures at the nest site (Rader et al. 2007, Carroll et al. 2018). However, I suspect there might be a linkage to amount of shrub cover at the nest site and cooler temperatures (Forrester et al. 1998, Carroll et al. 2018), but the lack of variability in shrub cover between nests in my study likely contributed to their statistical insignificance. Hens likely selected succulent-type vegetation, particularly yucca (50%) and cholla (29%), because they typically provide ample overhead cover for nests as well as protection from predators due to their spines. However, studies on quail and other grouse species indicate that grass cover might be the limiting factor in site selection, and quail in Texas specifically might be selecting shrubs because of a lack of grass cover due to overgrazing (Fritts et al. 2016, Kauffman et al. 2021).

Although the most frequently occurring temperatures at nest sites remained below the threshold considered to be lethal to incubating eggs (Reyna 2010); the number of increments where temperature rose above 45° C likely played a larger role than average temperature (McKechnie et al. 2012). Additionally, I suspect that even if vegetation conditions at nests were optimal, structure may not have been adequate to protect nest sites against the extreme temperatures early in the season in 2020 (Guthery et al. 2001, Carroll et al. 2015). Differences in temperature and precipitation between the two years my study took place likely played a large role in nest site selection, as temperature covariates were the most important in my hen survival analysis. According to the West Texas Mesonet, total rainfall in 2019 was approximately 66 cm versus 33 cm in 2020. Monthly rainfall averages were similar between the two years until April, when in 2019 monthly rainfall was greater than in 2020. The monthly total in 2019 was 7 cm, versus 0.6 cm in 2020. Additionally, average maximum temperatures were greater earlier in the season in 2020 than they were in 2019, with the average maximum occurring in August at 40° C in 2019, versus 43° C in July and 40.5° C in August of 2020 (West Texas Mesonet). Apart from forbs and bare ground, all vegetation measurements collected in 2020 had greater percentages of each ground cover type, as well as higher visual obstruction and taller vegetation heights. This could indicate that the temperature discrepancies between the two years also played a large role, as hens choose nest sites based on which vegetation characteristics will provide the most protection for both themselves and their eggs.

**Hen Survival and Nest Success**

Hen daily survival rates were similar to previous studies (Kauffman 2019, Tanner et al. 2019); however, the top performing model indicated that survival rates were different between the two years my study took place. Temperatures peaked earlier and higher during the 2020 season, which could explain the discrepancy in hen survival estimates between the two years. Hens spend anywhere from 148 to 158 minutes off the nest during a 24 hr period, defined as "off-bouts", and studies have shown that they alter their incubation patterns and behavior based on environmental factors such as temperature and precipitation (Coe et al. 2015, Carroll et al. 2015). Coe et al. (2015)

suggested that females that nest earlier in the season have lower nest survival probabilities due to egg cooling and more temperature fluctuations. However, I suggest that the higher-than-average temperatures during off-bouts earlier in my study potentially put more of a strain on hens for a longer amount of time. Although my competing models were statistically insignificant, they still suggested a relationship with temperature and home range and habitat characteristics, which may have become more significant with a larger sample size. Largest patch index was typically within the succulents/grassland category, which could explain the positive interaction with survival as this is usually the optimal vegetation type for scaled quail at the nest site as well as at the home range scale (Carroll et al. 2015, Fulbright et al. 2019).

Woody vegetation encroachment, mesquite specifically, has detrimental effects on landscapes as it tends to compete with native vegetation and reduce habitat quality (Rho et al. 2015). I suspect this was the primary factor responsible for the negative relationship between hen survival and woody vegetation in both home range and core use areas. Mesquite has a relatively high water-demand in relation to native shrubs and grasses, making it highly competitive and destructive (Nie et al. 2012, Shackleton et al. 2015). When mesquite encroaches on a grassland, it often causes a domino effect with encroachment followed by direct competition with native species and subsequent increases in bare ground and temperature at the ground-level, creating less favorable conditions in areas with mesquite cover. A similar effect likely had an influence on nest success as well. Based on previous studies I know that temperature is a critical component to nest survival (Carroll et al. 2018, Kauffman 2019, Belnap et al. 2019), however, I suspect that temperature and the resulting damage from woody vegetation encroachment both work in tandem to lower scaled quail survival during the breeding season. This finding coincides with evidence from a winter survival analysis conducted at my study site, which indicated that woody vegetation also played a role in winter survival (M. Silva, unpublished data).

Scaled quail exhibit synchronous hatching, meaning hens do not begin incubation until the last egg has been laid, allowing the nest to be exposed to various environmental factors for varying amounts of time depending on the size of the clutch (Guthery et al. 2005, Carroll et al. 2018). This can be problematic as the pre-incubation period is a crucial time in the developmental stage of chicks (Reyna 2010, Belnap et al. 2019). Carroll et al. (2018) determined that hens typically time their off-bouts from 06:00 to 08:00 and 17:00 to 19:00, something that I observed during my field season, as I planned my trapping and ibutton deployment around these times. I noted that temperatures at successful nests were warmer, on average, in the early morning hours prior to the morning off-bout at (01:00 to 03:00) and cooler during nighttime hours after the evening off-bout (22:00 to 24:00) in comparison to failed nests (Carroll et al. 2018, Kauffman et al. 2021). From my nest site selection analysis, I observed a normally distributed pattern in temperature recordings at nest sites versus a bimodal distribution at random sites, which could indicate less fluctuation at nest sites. These observations potentially support the hypothesis that more temperature fluctuations at the nest (>1° C) cause adverse effects on survival (Rader et al. 2007, Belnap et al. 2019, Kauffman et al. 2021). It is worth noting that many of the studies focusing on incubation temperatures and egg exposure were performed on northern bobwhites, scaled quail have exhibited more resilience towards extreme conditions (Carroll et al. 2018), requiring further species-specific research into the topic.

While I was unable to determine the exact cause of each nest failure, I suspect that most nests were predated. I have photo evidence of eggshells that appear to have been broken open by mesocarnivores. However, I speculate that predations worked in conjunction with weather patterns and vegetation structure at nests (Coe et al. 2015, Carroll et al. 2015). As previously mentioned, vegetation structure at nests may not have been adequate to protect the hen and incubating eggs from temperature extremes (Guthery et al. 2000). High temperatures could have forced more frequent off-bouts, making hens and their nests more vulnerable to predation (Carroll et al. 2015). In addition, drought conditions leading to vegetation die-off could have also made nests more susceptible to predation (Guthery et al. 1988, Briggs and Knapp 1995). Nest abandonments also likely occurred due to above average temperatures, as females will abandon nests in favor of self-maintenance (Coe et al. 2015); I found several nests during the duration of my study with eggs left untouched (Carroll et al. 2018).

**Home Range and Woody Vegetation Composition**

Both home ranges and core use areas were larger, on average in 2019 than 2020, which I suspect is likely due to the weather patterns observed between the two years (Orange 2015). As previously mentioned, my study site received greater average precipitation in 2019 and experienced lower average temperatures in comparison to the 2020 season. I noted a greater amount of forbs for a longer duration of the nesting period in 2019 versus 2020. However, vegetation in 2020 was taller and more abundant, which could have potentially offset the higher-than-average temperatures and allowed for hens to move farther distances. It is also worth noting that GPS transmitters were deployed later in the season in 2020 versus 2019, which could also have impacted home range sizes.

Although I calculated a moderate agreement in my accuracy assessment of the classified drone images, I had to consider the variability amongst image quality between years as well as flights when analyzing the results of my home range selection analyses. Drone flights for the 2019 season were all conducted on the same day during a single afternoon. However, drone flights for the 2020 season were conducted across multiple days, and some flights had to be separated between days due to technical difficulties as well as work schedule constraints. However, I was able to fly the drone on fully sunny days for all flights. Additionally, the similarities in the spectral signatures of green vegetation (grassland, succulent species, herbaceous shrubs), posed some difficulties during the classification process and likely influenced our accuracy assessments. Lastly, some of the images were of lower quality, presumably due to wind interference, and made differentiating grassland, yucca, and cholla particularly challenging. However, based on the calculated accuracy and *kappa* coefficient agreement values, I am confident in the quality of the image classification accuracies.

The top model for home range selection suggested that grass played the largest role in site selection, indicating that greater percentages of grass are beneficial, and home range selection probability decreased when the landscape became more fragmented. However, I did not detect any significant differences between woody vegetation in used and random home ranges, which contradicted my hypothesis that there would be less woody vegetation in selected home ranges. Kline (2019) discovered that scaled quail in the South Texas Plains ecoregion appeared to only use woody vegetation in the proportion in which it was also available at the landscape level, which my findings support. Kauffman et al. (2021) concluded something similar, however, it is important to consider geographic location differences. Their study was conducted in New Mexico, and their findings indicated that visual obstruction was more important to scaled quail site selection, something we did not observe in my study. I did discover that there was a slightly greater percentage of woody vegetation in core use areas in proportion to home ranges, approximately 3%, which could indicate that the threshold in which scaled quail begin to avoid woody vegetation occurs between 1.5% to 3%. I acknowledge previous studies concluding invasive woody vegetation is beneficial for gallinaceous birds by reducing microclimate temperatures (Guthery et al. 2001a, Carroll et al. 2016, Kline et al. 2019). However, based on my results and other literature, I contend that woody vegetation (mesquite) is more harmful than beneficial in the SHP ecoregion in the long-term (Guthery et al. 2001b, Rho et al. 2015, Shackleton et al. 2015, McKechnie et al. 2012).

Grasses, specifically native bunchgrasses, are an important component of scaled quail habitat for multiple reasons. Native grass species provide habitat for arthropods, which are a crucial component to both breeding hen and chick diet (Schemnitz 1961, Campbell-Kissock et al. 1985). They also support lower microclimate temperatures in comparison to woody vegetation because they are associated with lower amounts of bare ground, as grass species typically do not occur underneath woody vegetation (He et al. 2010). Additionally, native bunchgrasses do not impair movement of scaled quail as severely as non-native grasses due to their structure, as non-native grasses are typically denser (Fulbright et al. 2019). Lastly, grasses may potentially provide more air-flow at the ground level, further cooling microclimate temperatures (Kauffman et al. 2021).

I noted a lower average amount of total edge in used home ranges versus random, although this trend was not statistically significant. Previous studies have concluded that larger amounts of edge habitat can have detrimental effects on grassland birds (Chalfoun et al. 2002, Stephens et al. 2003). One issue with greater amounts of edge is the relationship between edge habitat and increased accounts of predation (Chalfoun et al. 2002, Stephens et al. 2003, Rollins et al. 2009). Interestingly there was a greater percentage of bare ground in used home ranges in proportion to random home ranges as well as at the ranch level. Again, increased amounts of bare ground increase quail susceptibility to aerial predation due to the distances they typically travel in one day (Orange 2015).

## Conclusion

My findings add to the growing body of scaled quail nesting ecology, and while I concur that nest survival is dependent upon precipitation and temperature (Campbell 1968, Pleasant et al. 2006, Kauffman et al. 2021), my results indicate that woody vegetation also plays an important role. A role that I suspect will become increasingly important as climate change continues to progress (Bridges et al. 2002, Carey 2009, Shackleton et al. 2015). I postulate that adult scaled quail depend more on landscape-scale habitat features, whereas nest success appears to depend more on microclimate conditions (Kauffman 2019), with both depending on weather characteristics such as precipitation and temperature. While we are unable to control factors such as high temperatures, we can alter landscapes to mitigate the impacts of increasingly extreme weather patterns. Based on the results of this study, I recommend that land management practices in the SHP focus on decreasing woody vegetation (mesquite), increasing non-invasive native vegetation, specifically succulent and native grass species, and control grass height with light to moderate livestock grazing (as livestock grazing was the primary land-use on my study site) and prescribed fire (Rollins et al. 2009). Texas Parks and Wildlife recommends approximately one-third of total area of native grass be burned every three years on a rotational schedule to be the most beneficial for quail management, optimally burning between March – April, or August – September. I recommend that future research on scaled quail in the SHP ecoregion focus further on microclimate conditions and vegetation structures at nest sites, as well as at woody vegetation usage at nest sites and the home range scale.

*Table 1. Scaled Quail (Callipepla squamata) Hen Survival (April 1 – August 15) (n=37) 2019 and 2020 in the Southern High Plains of Texas, Hot Days = Number of days during each hen's survival period where ambient temperature >40° C, Total Area (ha), Percent Landscape (%), Largest Patch (ha)*

| Model | $AIC_c$ | $\Delta AIC_c$ | $\omega_i$ | Likelihood | K |
|---|---|---|---|---|---|
| Number of Hot Days - Different Years | 159.14 | 0.00 | 1.00 | 1 | 3 |
| Total Area of Woody Veg - CA - Year Same | 174.04 | 14.90 | 0.00 | 0 | 2 |
| Null | 174.43 | 15.29 | 0.00 | 0 | 1 |
| Total Area of Woody Veg - CA and HR - Year Same | 174.96 | 15.82 | 0.00 | 0 | 3 |
| Total Area of Woody Veg - HR - Year Same | 174.94 | 15.80 | 0.00 | 0 | 2 |
| Percentage of Woody Veg - CA and HR - Year Same | 176.16 | 17.02 | 0.00 | 0 | 3 |
| Total Area, Percent Landscape, Largest Patch of Bare Ground - Year Same | 176.40 | 17.26 | 0.00 | 0 | 7 |
| Total Area, Percent Landscape, Largest Patch of Succulents - Year Same | 177.28 | 18.14 | 0.00 | 0 | 7 |
| Largest Patch - HR - Year Same | 177.48 | 18.34 | 0.00 | 0 | 6 |
| Total Area - HR - Year Same | 177.53 | 18.39 | 0.00 | 0 | 6 |
| Largest Patch - CA - Year Same | 177.82 | 18.68 | 0.00 | 0 | 7 |
| Total Area, Percent Landscape, Largest Patch of Woody Veg - CA - Year Same | 177.70 | 18.56 | 0.00 | 0 | 4 |
| Total Area, Percent Landscape, Largest Patch of Grassland - HR and CA - Year Same | 178.98 | 19.84 | 0.00 | 0 | 6 |
| Total Area, Percent Landscape, Largest Patch of Woody Veg - HR - Year Same | 178.79 | 19.65 | 0.00 | 0 | 4 |
| Total Area - CA - Year Same | 180.09 | 20.95 | 0.00 | 0 | 7 |
| Total Area, Percent Landscape, Largest Patch of Woody Veg - CA and HR - Year Same | 179.76 | 20.62 | 0.00 | 0 | 7 |
| Total Area HR and CA - Year Same | 185.25 | 26.11 | 0.00 | 0 | 12 |
| Largest Patch - CA and HR - Year Same | 186.71 | 27.57 | 0.00 | 0 | 15 |
| Percent Landscape- CA and HR - Year Same | 28360.05 | 28200.91 | 0.00 | 0 | 12 |

***Table 2. Scaled Quail (Callipepla squamata) Nest Survival (April 1 – August 15) (n=39) 2019 and 2020 Seasons in the Southern High Plains of Texas, Main Vegetation Type = Yucca, cholla, catclaw acacia, bunchgrass, sagebrush, mesquite, Hot Days = Number of 30-minute increments where temperature >45C, Minimum Temperature = Recorded at nest site with ibuttons, Maximum Temperature = Recorded at nest site with ibuttons, Precipitation = Amount of precipitation that fell during each individual nesting period collected from West Texas Mesonet, Visual Obstruction = Robel pole measurements, measured grass and shrub cover separately, Ground Cover Measurements (%)***

| Model | $AIC_c$ | $\Delta AIC_c$ | $\omega_i$ | Likelihood | K |
|---|---|---|---|---|---|
| Different Year | 203.59 | 0.00 | 0.31 | 1 | 2 |
| Null | 204.48 | 0.89 | 0.20 | 1 | 1 |
| Main Vegetation Type - Different Year | 204.68 | 1.09 | 0.18 | 1 | 3 |
| Number of Hot Days - Different Year | 204.89 | 1.30 | 0.16 | 1 | 3 |
| Visual Obstruction of Grass - Different Year | 205.95 | 2.35 | 0.09 | 0 | 4 |
| Visual Obstruction of Shrubs - Different Year | 207.21 | 3.62 | 0.05 | 0 | 4 |
| All Temperature Covariates - Different Year | 210.51 | 6.92 | 0.01 | 0 | 6 |
| Ground Cover Measurements - Different Year | 211.88 | 8.29 | 0.00 | 0 | 7 |
| All Weather Covariates - Different Year | 212.41 | 8.82 | 0.00 | 0 | 7 |
| Main Vegetation Type, Visual Obstructions, Ground Cover Measurements - Different Year | 217.43 | 13.84 | 0.00 | 0 | 12 |

***Table 3. Summary Statistics for Temperatures at Scaled Quail (Callipepla squamata) Hen Nests (n=39) (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas, Quantiles all refer to proportions of temperatures that occur in each (i.e. 25% of temperatures occur below 27.5° C, and 75% occur above)***

| Point Location | Categories Band Number | N | Mean | Standard Error | Minimum | Temperature Maximum | 25th Quantile | 50th Quantile | 75th Quantile | 95th Quantile |
|---|---|---|---|---|---|---|---|---|---|---|
| Nest | 5711 | 543 | 6.68 | 0.29 | 20 | 48.5 | 27.5 | 33.5 | 38.5 | 43.5 |
| | 5711(2) | 572 | 6.77 | 0.28 | 18.5 | 49.5 | 27.25 | 33.5 | 38.5 | 44.5 |
| | 5781 | 616 | 7.05 | 0.28 | 14.5 | 44.5 | 27 | 33.75 | 38.75 | 42 |
| | 6413 | 442 | 7.49 | 0.36 | 19 | 57.5 | 26 | 29.5 | 32.5 | 51.5 |
| | 6413(2) | 476 | 7.17 | 0.33 | 18 | 55.5 | 28 | 34 | 38.5 | 46.5 |
| | 6421 | 819 | 9.96 | 0.35 | 17.5 | 60 | 26 | 36.5 | 44.5 | 51.5 |
| | 6421(2) | 660 | 4.14 | 0.16 | 20.5 | 39.5 | 26.5 | 30.5 | 33.5 | 36.5 |
| | 6531 | 710 | 8.83 | 0.33 | 10.5 | 53.5 | 26.5 | 34.5 | 40.5 | 48.5 |
| | 6755 | 596 | 5.1 | 0.21 | 15.5 | 46.5 | 24 | 28.5 | 32 | 36 |
| | 6755(2) | 462 | 6.85 | 0.32 | 19 | 47.5 | 29 | 35.5 | 40 | 44 |
| | 6762 | 596 | 4.36 | 0.18 | 15.5 | 39.5 | 21.5 | 24.5 | 27.5 | 32 |
| | 6776 | 474 | 3.95 | 0.18 | 17.5 | 36.5 | 24 | 26 | 29.5 | 33.5 |
| | 6784 | 626 | 5.39 | 0.22 | 20.5 | 43.5 | 29 | 33.25 | 36.5 | 41 |
| | 6786 | 516 | 6.11 | 0.27 | 19.5 | 46 | 29.5 | 35 | 39 | 42.5 |
| | 6788 | 636 | 5.11 | 0.2 | 18 | 40 | 25 | 28.5 | 33 | 37 |
| | 6789 | 540 | 5.6 | 0.24 | 19 | 43 | 27.5 | 32.5 | 37 | 41 |
| | 6793 | 748 | 7.25 | 0.26 | 19.5 | 48 | 26.5 | 31.5 | 39 | 45 |
| | 6794 | 300 | 4.37 | 0.25 | 15.5 | 37 | 21 | 24 | 27 | 32.75 |
| | 7612 | 536 | 5.31 | 0.23 | 15.5 | 39 | 22 | 27 | 30.5 | 34.5 |
| | 7612(2) | 652 | 5.33 | 0.21 | 19 | 42 | 25.5 | 30 | 34.5 | 38.5 |
| | 7616 | 604 | 5.16 | 0.21 | 14.5 | 41.5 | 21 | 24.5 | 28.5 | 34 |
| | 7616(2) | 792 | 6.74 | 0.24 | 18.5 | 48.5 | 25 | 31 | 36.5 | 42 |
| | 7694 | 598 | 4.46 | 0.18 | 15.5 | 36 | 20 | 22.5 | 26 | 31.5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 7754 | 1878 | 7.73 | 0.18 | 14 | 53 | 27 | 33.5 | 39.5 | 46 |
| | 7754(2) | 530 | 3.93 | 0.17 | 22 | 41 | 28 | 31.5 | 34.5 | 38.5 |
| | 7754(3) | 618 | 6.33 | 0.25 | 19.5 | 55 | 26.5 | 30 | 32.5 | 49 |
| | 7758 | 939 | 8.58 | 0.28 | 13.5 | 49.5 | 26.5 | 34 | 42.5 | 46 |
| | 7758(2) | 484 | 5.35 | 0.24 | 17.5 | 45 | 29 | 33.5 | 37 | 41 |
| | 7758(3) | 984 | 2.94 | 0.09 | 20.5 | 38.5 | 30.5 | 32.5 | 34 | 36.5 |
| | 7764 | 706 | 8.54 | 0.32 | 17.5 | 59.5 | 30.5 | 37 | 42.5 | 51 |
| | 7777 | 616 | 4.17 | 0.17 | 18.5 | 40 | 28.5 | 32.5 | 35.5 | 38 |
| | 7777(2) | 616 | 5.16 | 0.21 | 19 | 45 | 28.5 | 31.5 | 35.5 | 40 |
| | 7778 | 492 | 5.21 | 0.24 | 18 | 46 | 30.5 | 34.5 | 37.5 | 40.5 |
| | 7778(2) | 660 | 2.83 | 0.11 | 21 | 34 | 26 | 29 | 30.5 | 32.5 |
| | 7786 | 666 | 8.43 | 0.33 | 15 | 54.5 | 28 | 35 | 40.5 | 49 |
| | 7796 | 529 | 4.45 | 0.19 | 18.5 | 41 | 29 | 33 | 36 | 39.5 |
| | 7796(2) | 572 | 5.13 | 0.21 | 18.5 | 45 | 28 | 31.5 | 35 | 40.5 |
| | 7796(3) | 590 | 6.3 | 0.26 | 20.5 | 47 | 26.5 | 31.5 | 37.5 | 43.5 |
| Random | 5711 | 612 | 9.23 | 0.37 | 85.11 | 56.5 | 29.5 | 37 | 45.5 | 52.5 |
| | 5711(2) | 572 | 11.06 | 0.46 | 122.24 | 64 | 28.5 | 39.5 | 48.5 | 56 |
| | 5781 | 597 | 12.56 | 0.51 | 157.73 | 69.5 | 26 | 41 | 47.5 | 59 |
| | 6413 | 441 | 8.84 | 0.42 | 78.12 | 58.5 | 27.5 | 35 | 43 | 48.5 |
| | 6413(2) | 590 | 12.11 | 0.5 | 146.73 | 63.5 | 26 | 39.25 | 48 | 57 |
| | 6421 | 820 | 6.7 | 0.23 | 44.96 | 51.5 | 26 | 32 | 36.5 | 42.75 |
| | 6421(2) | 660 | 9.83 | 0.38 | 96.56 | 57.5 | 30 | 41.5 | 48.5 | 52.5 |
| | 6531 | 697 | 8.79 | 0.33 | 77.32 | 53.5 | 27 | 35 | 40.5 | 48.5 |
| | 6755 | 596 | 8.64 | 0.35 | 74.72 | 48 | 23.5 | 31.5 | 39 | 43.5 |
| | 6755(2) | 511 | 9.34 | 0.41 | 87.18 | 54 | 28 | 39 | 45 | 48.5 |
| | 6762 | 596 | 7.49 | 0.31 | 56.11 | 45.5 | 22 | 27 | 35 | 40.5 |

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|---|---|---|---|---|---|---|---|---|---|---|
| 6776 | 741 | 9.65 | 0.35 | 93.14 | 54 | 24.5 | 27 | 41.5 | 48.5 |
| 6784 | 626 | 9.87 | 0.39 | 97.5 | 54.5 | 29.5 | 40.5 | 48 | 52.5 |
| 6786 | 308 | 9.73 | 0.55 | 94.71 | 53.5 | 27 | 38.25 | 45.5 | 50.5 |
| 6788 | 598 | 9.09 | 0.37 | 82.65 | 50 | 26 | 34 | 42.5 | 48 |
| 6789 | 616 | 10.15 | 0.41 | 103.07 | 53.5 | 27.5 | 40.5 | 47 | 51 |
| 6793 | 748 | 10.11 | 0.37 | 102.21 | 52.5 | 25 | 35 | 44 | 49.5 |
| 6794 | 586 | 9.02 | 0.37 | 81.39 | 53 | 22 | 28.5 | 37.5 | 45 |
| 7612 | 592 | 8.79 | 0.36 | 77.2 | 48.5 | 22 | 31.5 | 38 | 43 |
| 7612(2) | 652 | 9.5 | 0.37 | 90.33 | 51 | 25 | 34.5 | 43.5 | 48.5 |
| 7616 | 596 | 7.2 | 0.29 | 51.84 | 48 | 21.25 | 26.5 | 33 | 40 |
| 7616(2) | 792 | 6.58 | 0.23 | 43.24 | 46 | 27.5 | 34 | 39 | 43 |
| 7694 | 601 | 10.12 | 0.41 | 102.49 | 49 | 20 | 26.5 | 39.5 | 44.5 |
| 7754 | 939 | 9.83 | 0.32 | 96.6 | 55.5 | 29 | 42 | 47.5 | 50.5 |
| 7754(2) | 538 | 11.9 | 0.51 | 141.58 | 75 | 29.5 | 41.5 | 47.5 | 65 |
| 7754(3) | 618 | 7.96 | 0.32 | 63.34 | 55 | 27 | 35.5 | 41.5 | 46 |
| 7758 | 1863 | 11.99 | 0.28 | 143.71 | 59.5 | 26.5 | 38.5 | 48 | 53.5 |
| 7758(2) | 968 | 12.21 | 0.39 | 149.09 | 62 | 29 | 42.5 | 51.75 | 58 |
| 7758(3) | 984 | 7.76 | 0.25 | 60.24 | 51.5 | 29 | 35.5 | 43 | 48 |
| 7764 | 706 | 13.02 | 0.49 | 169.65 | 68.5 | 29.5 | 42 | 53 | 62.5 |
| 7777 | 594 | 9.71 | 0.4 | 94.32 | 59.5 | 31 | 41.25 | 49 | 55.5 |
| 7777(2) | 616 | 11.01 | 0.44 | 121.22 | 57 | 29.5 | 41 | 49.5 | 54.5 |
| 7778 | 538 | 10.48 | 0.45 | 109.8 | 60.5 | 32.5 | 43.5 | 50.5 | 56 |
| 7778(2) | 660 | 8.83 | 0.34 | 78.01 | 49.5 | 26 | 35 | 43.5 | 47.5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7786 | 668 | 8.02 | 0.31 | 64.29 | 51 | 28 | 35 | 40 | 47.5 |
| 7796 | 536 | 8.64 | 0.37 | 74.72 | 58 | 32 | 40.5 | 46.5 | 53.5 |
| 7796(2) | 572 | 9.71 | 0.41 | 94.32 | 56.5 | 31.5 | 38.5 | 48 | 53.5 |
| 7796(3) | 660 | 9.45 | 0.37 | 89.37 | 51.5 | 26.75 | 35.5 | 46 | 49 |

***Table 4. Visual Obstruction Measurements of Vegetation at Scaled Quail (Callipepla squamata)) Hen Nest Sites (n=35) and Paired Random Locations in the Southern High Plains of Texas***

| Bird-ID | Grass VOR N 100% | Grass VOR N 75% | Grass VOR N 50% | Grass VOR N 25% | Grass VOR N 0% | Grass VOR E 100% | Grass VOR E 75% | Grass VOR E 50% | Grass VOR E 25% | Grass VOR E 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 0 | 0 | 0 | 1-12 | 1,2 | 0 | 0 | 0 | 3-12 |
| 6794 | 1-2 | 0 | 0 | 0 | 3-12 | 1-2 | 0 | 0 | 0 | 3-12 |
| 7616 | 0 | 0 | 0 | 0 | 1-12 | 1-3 | 4 | 0 | 5 | 6-12 |
| 7616 | 0 | 1 | 2 | 0 | 2-12 | 1 | 0 | 0 | 2-12 | 0 |
| 7694 | 1-6 | 7-8 | 0 | 0 | 9-12 | 1-3 | 4 | 0 | 0 | 5-12 |
| 7694 | 1 | 0 | 3,5 | 2 | 4,6-12 | 1 | 0 | 0 | 2 | 3-12 |
| 6762 | 1 | 2 | 0 | 0 | 3-12 | 1 | 0 | 2 | 0 | 3-12 |
| 6762 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612 | 1,2 | 3 | 0 | 0 | 4-12 | 1,2 | 0 | 0 | 0 | 3-12 |
| 7612 | 1 | 2 | 0 | 3 | 4-12 | 1 | 0 | 0 | 2 | 3-12 |
| 6755 | 1,2 | 3 | 0 | 6-8 | 4,5,9-12 | 1 | 2 | 0 | 0 | 3-12 |
| 6755 | 1-3 | 0 | 0 | 4,5,8,9 | 6,10-12 | 1 | 2 | 0 | 3 | 4-12 |
| 7616(2) | 1-12 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 |
| 7616(2) | 1-3 | 0 | 4 | 0 | 5-12 | 1-12 | 0 | 0 | 0 | 0 |
| 6776 | 0 | 1 | 0 | 2 | 3-12 | 1 | 0 | 2 | 0 | 3-12 |
| 6776 | 0 | 1 | 0 | 2,3 | 4-12 | 0 | 1 | 0 | 2-4 | 5-12 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7612(2) | 1-4 | 5,6 | 0 | 7 | 8-12 | 1-4 | 0 | 0 | 5,6 | 7-12 |
| 7612(2) | 1 | 2,3 | 0 | 0 | 4-12 | 0 | 0 | 0 | 0 | 1-12 |
| 5711 | 1,2 | 3 | 0 | 4,5 | 6-12 | 1,2 | 0 | 3 | 7-12 | 4-6 |
| 5711 | 1-12 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2,3 | 4-12 |
| 6784 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6784 | 1,2 | 3,4 | 0 | 0 | 5-12 | 1,2 | 3-7 | 0 | 0 | 8-12 |
| 6786 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6786 | 1 | 2-4 | 5,6 | 7,8 | 9-12 | 1-3 | 4 | 5,6 | 7,8 | 9-12 |
| 6788 | 1-3 | 4 | 0 | 5,6 | 7-12 | 1-3 | 0 | 4 | 5-11 | 12 |
| 6788 | 1 | 0 | 2 | 3-6 | 7-12 | 1,2 | 0 | 3 | 4 | 5-12 |
| 6793 | 1-3 | 0 | 4 | 0 | 5-12 | 1,2,6 | 3,5,7 | 0 | 0 | 4,8-12 |
| 6793 | 1-3 | 4-6 | 0 | 7-10 | 11,12 | 1-3 | 4 | 5-7 | 8-12 | 0 |
| 6413(2) | 1-4 | 0 | 5 | 6 | 7-15 | 1 | 2 | 0 | 3 | 4-15 |
| 6423(2) | 1 | 2 | 3 | 4-6 | 7-15 | 1 | 0 | 2 | 3-6 | 7-15 |
| 7778(2) | 1 | 2,3 | 0 | 4 | 5-15 | 1-3 | 4 | 5 | 0 | 6-15 |
| 7778(2) | 1 | 2 | 3 | 4-6 | 7-15 | 0 | 0 | 1 | 2-4 | 5-15 |
| 6421(2) | 1-3 | 4 | 5 | 6-10 | 11-15 | 1-3 | 4,5 | 0 | 6-13 | 14,15 |
| 6421(2) | 1 | 0 | 0 | 2-4 | 5-15 | 1 | 2 | 3 | 4-8 | 9-15 |
| 7796(3) | 1-3 | 4 | 0 | 5-7 | 8-15 | 1,2 | 3 | 0 | 4,5 | 6-15 |
| 7796(3) | 1 | 2,3 | 0 | 4-7 | 8-15 | 1 | 0 | 2-4 | 5,6 | 7-15 |
| 7754(3) | 7,12 | 1,8,11,13 | 9 | 2,6,10 | 3-5,14,15 | 0 | 1 | 0 | 2,8,11-15 | 3-7,9,10 |
| 7754(3) | 0 | 1 | 0 | 2 | 3-15 | 0 | 1 | 0 | 2 | 3-15 |
| 7754(2) | 0 | 0 | 0 | 1-3 | 4-15 | 1 | 2 | 0 | 3 | 4-15 |
| 7754(2) | 1 | 2 | 3 | 8 | 4-7,9-15 | 0 | 0 | 1 | 2-7 | 8-15 |
| 6421 | 0 | 0 | 1 | 6-15 | 2-5 | 0 | 0 | 0 | 1-12 | 13-15 |
| 6421 | 1 | 2 | 3 | 4-6 | 7-15 | 1,2 | 3,4 | 5-8 | 9-12 | 13-15 |
| 6413 | 0 | 1 | 0 | 2-5 | 6-15 | 0 | 1 | 0 | 2-5 | 6-15 |
| 6413 | 0 | 1 | 0 | 2-3 | 4-15 | 0 | 1 | 0 | 2,4-6 | 3,7-15 |
| 7777(2) | 1,2 | 0 | 3 | 0 | 4-15 | 1 | 2 | 0 | 3-8 | 9-15 |
| 7777(2) | 0 | 0 | 1 | 2 | 3-15 | 0 | 1 | 2 | 3 | 4-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7758(2) | 1 | 0 | 2,3 | 4-9 | 10-15 | 1 | 0 | 0 | 2,3 | 4-15 |
| 7758(2) | 1-4 | 0 | 0 | 5-10 | 11-15 | 1,2 | 3,4 | 5-7 | 8-10,15 | 11-13 |
| 7758(3) | 1-3 | 0 | 4,5 | 6-8 | 9-15 | 1,2 | 3 | 0 | 4-9 | 10-15 |
| 7758(3) | 1 | 2 | 0 | 3-7 | 8-15 | 0 | 1 | 0 | 13,14 | 2-12,15 |
| 7758 | 1 | 0 | 2 | 3,4 | 5-15 | 1 | 0 | 0 | 2,3 | 4-15 |
| 7758 | 1 | 0 | 2 | 3-5 | 6-15 | 1 | 6,7 | 5 | 2-4,8-11 | 12-15 |
| 7778 | 0 | 1 | 0 | 2 | 3-15 | 1 | 0 | 0 | 2 | 3-15 |
| 7778 | 0 | 0 | 1-10 | 13-15 | 0 | 1 | 0 | 2 | 3,4 | 5-15 |
| 5781 | 1-5 | 0 | 0 | 6 | 7-15 | 1-3 | 4 | 0 | 0 | 5-15 |
| 5781 | 0 | 0 | 0 | 1 | 2-15 | 0 | 0 | 1 | 0 | 2-15 |
| 7764 | 1,2 | 3 | 0 | 4 | 5-15 | 1,2 | 0 | 0 | 3,4 | 5-15 |
| 7764 | 0 | 1 | 2-7 | 9-12,15 | 8 | 1 | 2,3 | 4 | 5-8 | 9-15 |
| 7786 | 2,3 | 3,4 | 0 | 5-10 | 11-15 | 1-3 | 0 | 8-15 | 7-10 | 0 |
| 7786 | 1-4 | 5,6 | 0 | 7 | 8-15 | 1 | 0 | 2,3 | 4 | 5-15 |
| 7777 | 1 | 0 | 0 | 2-6 | 7-15 | 1 | 2 | 0 | 3-7 | 8-15 |
| 7777 | 1,2 | 3,4 | 0 | 5-7 | 8-15 | 1,2 | 3 | 0 | 4,5 | 6-15 |
| 6531 | 1 | 2 | 0 | 3 | 4-15 | 0 | 0 | 1 | 2 | 3-15 |
| 6531 | 0 | 1 | 2,3 | 4-6 | 7-15 | 0 | 1 | 2,3 | 4,5 | 6-15 |
| 7754 | N/A | N/A | N/A | N/A | N/A | 1,2 | 3 | 0 | 5 | 4,6-15 |
| 7754 | 0 | 0 | 0 | 1,2 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 7796(2) | 1 | 2 | 0 | 3 | 4-15 | 1,2 | 0 | 3 | 0 | 4-15 |
| 7796(2) | 0 | 1 | 2 | 3-5 | 6-15 | 0 | 1 | 2,3 | 0 | 4-15 |
| 7796 | 1,3 | 2,4 | 0 | 5-6 | 7-15 | 1 | 2 | 0 | 3 | 7-15 |
| 7796 | 0 | 1 | 0 | 2,4 | 3,5-15 | 1 | 2 | 0 | 3-5 | 6-15 |

| **Bird-ID** | **Grass VOR S 100%** | **Grass VOR S 75%** | **Grass VOR S 50%** | **Grass VOR S 25%** | **Grass VOR S 0%** | **Grass VOR W 100%** | **Grass VOR W 75%** | **Grass VOR W 50%** | **Grass VOR W 25%** | **Grass VOR W 0%** |
|---|---|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 0 | 0 | 0 | 1-12 | 1-9 | 0 | 10 | 0 | 11-12 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6794 | 1-4 | 0 | 0 | 5 | 6-12 | 1 | 2 | 0 | 0 | 3-12 |
| 7616 | 1-4 | 0 | 0 | 5 | 6-12 | 0 | 1 | 0 | 0 | 2-12 |
| 7616 | 1 | 2 | 0 | 0 | 3012 | 1-2 | 3 | 4 | 0 | 5-12 |
| 7694 | 1-5 | 8,6 | 7,9 | 0 | 10-12 | 1-6 | 7 | 8,9 | 0 | 10-12 |
| 7694 | 1 | 0 | 0 | 2 | 3-12 | 1 | 0 | 0 | 2 | 3-12 |
| 6762 | 0 | 0 | 1 | 2 | 3-12 | 0 | 1,3 | 2 | 0 | 4-12 |
| 6762 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612 | 1 | 2 | 0 | 0 | 3-12 | 1 | 0 | 2 | 0 | 3-12 |
| 7612 | 1 | 0 | 2 | 0 | 3-12 | 1,2 | 0 | 0 | 4 | 5-12 |
| 6755 | 1 | 2 | 0 | 3 | 4-12 | 1-3 | 4 | 0 | 5,6 | 7-12 |
| 6755 | 1-3 | 4 | 0 | 0 | 5-12 | 1,2 | 0 | 10 | 11,12 | 3-9 |
| 7616(2) | 1-12 | 0 | 0 | 0 | 0 | 1-8 | 9 | 0 | 10-12 | 0 |
| 7616(2) | 1-6 | 0 | 7 | 0 | 8-12 | 1-4 | 5 | 6 | 0 | 7-12 |
| 6776 | 0 | 0 | 0 | 0 | 1-12 | 0 | 1 | 0 | 2 | 3-12 |
| 6776 | 1 | 0 | 0 | 2,3 | 4-12 | 1 | 2 | 0 | 4,3 | 5-12 |
| 7612(2) | 1 | 2 | 0 | 0 | 3-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612(2) | 1 | 0 | 0 | 2 | 3-12 | 1-12 | 0 | 0 | 0 | 0 |
| 5711 | 1,2 | 3 | 0 | 4 | 5-12 | 1,2 | 3 | 0 | 0 | 4-12 |
| 5711 | 1-6 | 7 | 0 | 8,9 | 10-12 | 1-8 | 9,10 | 0 | 11,12 | 0 |
| 6784 | 1-12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1-12 |
| 6784 | 1,2 | 3,4 | 5,6 | 0 | 7-12 | 1-3 | 4 | 0 | 5 | 6-12 |
| 6786 | 1-4 | 5,6 | 0 | 0 | 7-12 | 1-3 | 4 | 0 | 0 | 5-12 |
| 6786 | 1-5 | 6,7 | 8 | 9-11 | 12 | 0 | 0 | 0 | 1 | 2-12 |
| 6788 | 1-3 | 4 | 0 | 5 | 6-12 | 1-7 | 0 | 0 | 0 | 8-12 |
| 6788 | 1,2 | 0 | 0 | 3-6 | 7-12 | 1-3 | 0 | 4 | 5,6 | 7-12 |
| 6793 | 1 | 2 | 0 | 3,4,8 | 5-7,9-12 | 1-8 | 0 | 0 | 9 | 10-12 |
| 6793 | 1,2 | 3 | 4 | 5,6 | 7-12 | 1-4 | 5 | 0 | 6,7 | 8-12 |
| 6413(2) | 1-2 | 3 | 4 | 5-8 | 9-15 | 1,2 | 3 | 0 | 4-9 | 10-15 |
| 6423(2) | 0 | 1,2 | 3 | 4-7 | 8-15 | 1,2 | 3 | 4,5 | 6-9,11,15 | 10-14 |
| 7778(2) | 1,2 | 0 | 0 | 3,4 | 5-15 | 1 | 2 | 0 | 3-5 | 6-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7778(2) | 1 | 2 | 3 | 4-7 | 8-15 | 1 | 0 | 2,3 | 4-8,12 | 9-11,13-15 |
| 6421(2) | 1-3 | 4 | 5,6 | 7-9 | 10-15 | 1-3 | 0 | 4 | 5-9 | 10-15 |
| 6421(2) | 0 | 1 | 0 | 2-7 | 8-15 | 1,2 | 3 | 4,5 | 6-9 | 10-15 |
| 7796(3) | 1 | 2 | 3 | 4-6 | 7-15 | 1 | 2,4 | 3 | 5 | 6-15 |
| 7796(3) | 1 | 2 | 3 | 4 | 5-15 | 1,2 | 3 | 4,5 | 6 | 7-15 |
| 7754(3) | 0 | 1 | 0 | 2 | 3-15 | 0 | 1 | 0 | 0 | 2-15 |
| 7754(3) | 0 | 1 | 0 | 2 | 3-15 | 0 | 1 | 0 | 2,3,6 | 4,5,7-15 |
| 7754(2) | 1 | 2 | 3 | 0 | 4-15 | 1,2 | 3 | 0 | 4 | 5-15 |
| 7754(2) | 1 | 0 | 2 | 3-7 | 8-15 | 0 | 1 | 0 | 2-8 | 9-15 |
| 6421 | 0 | 0 | 1 | 2 | 3-15 | 0 | 0 | 1-4 | 5-15 | 0 |
| 6421 | 1 | 2 | 3 | 4,12 | 5-11,13-15 | 0 | 0 | 1 | 2 | 3-15 |
| 6413 | 0 | 1 | 0 | 2-14 | 15 | 0 | 1,2 | 0 | 0 | 3-15 |
| 6413 | 0 | 1 | 2 | 3 | 4-15 | 0 | 1 | 2 | 3-15 | 0 |
| 7777(2) | 0 | 0 | 0 | 1-11 | 12-15 | 0 | 0 | 0 | 1-3 | 4-15 |
| 7777(2) | 0 | 1 | 0 | 2 | 3-15 | 0 | 1 | 0 | 2-5 | 6-15 |
| 7758(2) | 1 | 2 | 3 | 4 | 5-15 | 1 | 2 | 0 | 3-9 | 10-15 |
| 7758(2) | 1-4 | 5 | 0 | 6-11 | 12-15 | 1-4 | 0 | 5,6 | 7-12 | 13-15 |
| 7758(3) | 1-3 | 0 | 4,5 | 6-8 | 9-15 | 0 | 0 | 0 | 10,1-9 | 11-15 |
| 7758(3) | 1,2 | 3 | 0 | 4-6 | 7-15 | 0 | 0 | 1 | 2-4 | 5-15 |
| 7758 | 1 | 2 | 0 | 3,4,8 | 5-7,9-15 | 1-3 | 0 | 0 | 4,13 | 5-12,14,15 |
| 7758 | 1 | 0 | 2 | 3-5 | 6-15 | 0 | 0 | 1 | 9 | 2-8,10-15 |
| 7778 | 1 | 0 | 0 | 2-4,15 | 5-14 | 1 | 0 | 2,3 | 4 | 5-15 |
| 7778 | 0 | 0 | 0 | 1 | 2-15 | 0 | 1 | 0 | 2 | 3-15 |
| 5781 | 0 | 0 | 0 | 1-8,13 | 9-12,14,15 | 1,2 | 3 | 0 | 0 | 4-15 |
| 5781 | 0 | 1 | 0 | 2-5 | 6-15 | 0 | 0 | 1 | 0 | 2-15 |
| 7764 | 1-3 | 0 | 0 | 4,5 | 6-15 | 0 | 1 | 0 | 2 | 3-15 |
| 7764 | 1 | 2 | 3,4 | 5-7,11-13 | 14,15 | 1,2 | 3 | 4,5 | 6-8,12 | 9-11,13-15 |
| 7786 | 1 | 2 | 3 | 4-6 | 7-15 | 1 | 0 | 2,3 | 4,5 | 6-15 |
| 7786 | 1 | 2-6 | 7-9 | 10 | 11-15 | 1 | 2 | 3 | 4 | 5-15 |
| 7777 | 1 | 2 | 0 | 0 | 3-15 | 1,2 | 3,4 | 5 | 0 | 6-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7777 | 1-3 | 0 | 4,5 | 6-10 | 11-15 | 1 | 2 | 3,4 | 0 | 5-15 |
| 6531 | 0 | 1 | 0 | 2 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 6531 | 1 | 2,3 | 4,5 | 6,7 | 8-15 | 1-3 | 4,5 | 0 | 6-9,15 | 10-14 |
| 7754 | N/A | N/A | N/A | N/A | N/A | 1,2 | 3 | 0 | 4 | 5-15 |
| 7754 | 0 | 0 | 0 | 1-7 | 8-15 | 0 | 0 | 0 | 1-4 | 5-15 |
| 7796(2) | 1 | 0 | 2 | 0 | 3-15 | 1 | 0 | 0 | 2,3 | 4-15 |
| 7796(2) | 1-3 | 4 | 5 | 6,7,9 | 8,10-15 | 0 | 1 | 2 | 3 | 4-15 |
| 7796 | 1,2 | 3 | 4 | 6,7 | 5,8-15 | 1,2 | 3 | 0 | 4-6 | 7-15 |
| 7796 | 1 | 0 | 0 | 2-4 | 5-15 | 1 | 2,3 | 0 | 4-15 | 0 |

| **Bird-ID** | **Shrub VOR N 100%** | **Shrub VOR N 75%** | **Shrub VOR N 50%** | **Shrub VOR N 25%** | **Shrub VOR N 0%** | **Shrub VOR E 100%** | **Shrub VOR E 75%** | **Shrub VOR E 50%** | **Shrub VOR E 25%** | **Shrub VOR E 0%** |
|---|---|---|---|---|---|---|---|---|---|---|
| 6794 | 1-12 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3-12 |
| 6794 | 1-11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 1-12 |
| 7616 | 1-12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1-12 |
| 7616 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7694 | 1-5 | 0 | 6 | 0 | 7-12 | 1-3 | 4,5 | 6 | 0 | 7-12 |
| 7694 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6762 | 1-8 | 0 | 0 | 0 | 9-12 | 0 | 6,5,4 | 3 | 1,2 | 7-12 |
| 6762 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612 | 1-7 | 8 | 9-12 | 0 | 0 | 1-5 | 0 | 0 | 6 | 7-12 |
| 7612 | 1,2 | 3,4,7,8 | 0 | 5,6,10 | 11,12 | 1,2 | 3,4 | 0 | 6-8 | 5,9-12 |
| 6755 | 1-3 | 4 | 0 | 0 | 5-12 | 1-6 | 0 | 7 | 0 | 8-12 |
| 6755 | 1-4 | 0 | 0 | 5 | 6-12 | 0 | 8,9 | 7 | 6,10 | 1-5,11,12 |
| 7616(2) | 1-7 | 0 | 0 | 0 | 8-12 | 1-12 | 0 | 0 | 0 | 0 |
| 7616(2) | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6776 | 1,2 | 3,4 | 5,6 | 7-11 | 12 | 1 | 2-4 | 0 | 5,7-10 | 6,11,12 |
| 6776 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7612(2) | 1-4 | 0 | 5 | 6 | 7-12 | 0 | 0 | 0 | 3 | 1,2,4-12 |
| 7612(2) | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 5711 | 1,2 | 0 | 0 | 0 | 3-12 | 1,2 | 0 | 0 | 0 | 3-12 |
| 5711 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6784 | 1-7 | 0 | 8 | 0 | 9-12 | 1-7 | 8,9 | 0 | 10 | 11,12 |
| 6784 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6786 | 1-3,10-12 | 4-9 | 0 | 0 | 0 | 1-6 | 7 | 0 | 0 | 8-12 |
| 6786 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6788 | 1 | 0 | 0 | 0 | 2-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6788 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6793 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6793 | 0 | 0 | 0 | 0 | 1-12 | 1-3 | 4 | 0 | 5 | 6-12 |
| 6413(2) | 3,7-9,11 | 4,10 | 12 | 6,13 | 10-15 | 1-12 | 0 | 0 | 13 | 14,15 |
| 6423(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7778(2) | 0 | 0 | 0 | 5-7 | 1-4,8-15 | 1 | 2 | 0 | 3,4 | 5-15 |
| 7778(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6421(2) | 0 | 0 | 0 | 0 | 1-15 | 1-3 | 4 | 0 | 5 | 6-15 |
| 6421(2) | 1-3 | 4 | 5 | 6-8 | 9-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7796(3) | 1-5 | 6-9 | 10 | 11 | 12-15 | 0 | 5 | 0 | 4,6,8,9 | 1-3,7,10-15 |
| 7796(3) | 0 | 0 | 1,2 | 2 | 3-15 | 0 | 0 | 0 | 2,3 | 1,4-15 |
| 7754(3) | 1-3 | 5 | 4 | 6 | 7-15 | 1-3 | 4-6 | 0 | 7 | 8-15 |
| 7754(3) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754(2) | 0 | 9 | 6 | 2,5,7,8,10 | 1,3,4,11-15 | 6-15 | 4,5 | 2,3 | 0 | 1 |
| 7754(2) | 0 | 0 | 0 | 0 | 1-15 | 1 | 2-5 | 6 | 7 | 8-15 |
| 6421 | 2 | 1,3 | 0 | 4,5 | 6-15 | 1-4 | 5 | 6,7 | 8 | 9-15 |
| 6421 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6413 | 1-11 | 12 | 0 | 13 | 14,15 | 1-6 | 7 | 8,9 | 10-12 | 13-15 |
| 6413 | 1-4 | 5 | 0 | 6 | 7-15 | 1 | 2 | 3,4 | 5,6 | 7-15 |
| 7777(2) | 1,2 | 3-6,10,11 | 8,9,12-15 | 7 | 0 | 0 | 0 | 1 | 4,5,12 | 2,3,6-10,13-15 |
| 7777(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7758(2) | 1-3 | 0 | 0 | 4 | 5-15 | 1-3 | 4 | 5 | 6-9 | 10-15 |
| 7758(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 1-4 | 5-15 |
| 7758(3) | 0 | 0 | 0 | 4-6 | 1-3,7-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7758(3) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7758 | 1-3 | 0 | 0 | 4-7 | 8-15 | 1,2 | 3 | 4 | 5,6 | 7-15 |
| 7758 | 0 | 0 | 0 | 1,2 | 3-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7778 | 1-3 | 13-15,4 | 11,5 | 6-9 | 12,10 | 1-3 | 11,12 | 5,4 | 13 | 6-8,14,15 |
| 7778 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 5781 | 0 | 0 | 0 | 1-4 | 5-15 | 0 | 0 | 1,2 | 3-6 | 7-15 |
| 5781 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7764 | 6-15 | 0 | 0 | 5 | 1-4 | 1-4 | 5,6 | 0 | 7-9,12-14 | 10,11,15 |
| 7764 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7786 | 1-3 | 4-7 | 0 | 8 | 9-15 | 1-6 | 7,8 | 0 | 9 | 10-15 |
| 7786 | 1-5 | 0 | 6 | 7 | 8-15 | 1 | 0 | 0 | 0 | 1-15 |
| 7777 | 1-8 | 9,11-14 | 0 | 10,15 | 0 | 1 | 2 | 0 | 6,7 | 3-5,8-15 |
| 7777 | 1,3 | 2 | 0 | 15 | 4-14 | 0 | 0 | 0 | 0 | 1-15 |
| 6531 | 1-3 | 4 | 0 | 5-9 | 10-15 | 1-5 | 0 | 6 | 7 | 8-15 |
| 6531 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | N/A | N/A | N/A | N/A | N/A | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7796(2) | 0 | 0 | 5 | 0 | 1-4,6-15 | 0 | 5,6 | 7 | 8,9 | 1-4,6-15 |
| 7796(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7796 | 0 | 0 | 0 | 3-5 | 1,2,6-15 | N/A | N/A | N/A | N/A | N/A |
| 7796 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 1 | 2-15 |

| **Bird-ID** | **Shrub VOR S 100%** | **Shrub VOR S 75%** | **Shrub VOR S 50%** | **Shrub VOR S 25%** | **Shrub VOR S 0%** | **Shrub VOR W 100%** | **Shrub VOR W 75%** | **Shrub VOR W 50%** | **Shrub VOR W 25%** | **Shrub VOR W 0%** |
|---|---|---|---|---|---|---|---|---|---|---|
| 6794 | 1-12 | 0 | 0 | 0 | 0 | 1-10 | 0 | 11 | 12 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 0 | 0 | 0 | 1-12 | 1,2 | 0 | 3 | 0 | 4-12 |
| 7616 | 0 | 7-9 | 0 | 5-6 | 1-4, 10-12 | 1-5 | 6 | 0 | 7 | 8-12 |
| 7616 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7694 | 0 | 0 | 0 | 0 | 1-12 | 1,2 | 0 | 3-5 | 0 | 6-12 |
| 7694 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6762 | 0 | 0 | 0 | 2-6 | 1,7-12 | 0 | 0 | 0 | 3-6 | 7-12 |
| 6762 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6755 | 1-3 | 4 | 0 | 0 | 5-12 | 1 | 0 | 0 | 2 | 3-12 |
| 6755 | 0 | 5-8 | 10 | 9,11,12 | 1-4 | 1-9 | 0 | 0 | 10 | 11,12 |
| 7616(2) | 1-12 | 0 | 0 | 0 | 0 | 1-10 | 0 | 11 | 12 | 0 |
| 7616(2) | 1-3 | 0 | 0 | 0 | 4-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6776 | 1-3 | 4 | 0 | 5 | 6-12 | 0 | 0 | 0 | 2-5 | 1,6-12 |
| 6776 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 7612(2) | 0 | 0 | 0 | 0 | 1-12 | 1 | 0 | 0 | 2 | 3-12 |
| 7612(2) | 0 | 0 | 0 | 0 | 1-12 | 3 | 0 | 0 | 0 | 1,2,4-12 |
| 5711 | 1-3 | 0 | 0 | 0 | 4-12 | 1 | 0 | 0 | 0 | 2-12 |
| 5711 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6784 | 1-5 | 6 | 0 | 0 | 7-12 | 1-5 | 6 | 0 | 0 | 7-12 |
| 6784 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6786 | 0 | 0 | 0 | 6-8 | 1-5,9-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6786 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6788 | 1,2 | 0 | 0 | 0 | 3-12 | 1-3 | 0 | 4 | 5,8,11,12 | 6,7,9,10 |
| 6788 | 0 | 0 | 0 | 0 | 1-12 | 1,2 | 0 | 0 | 3 | 4-12 |
| 6793 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6793 | 0 | 0 | 0 | 0 | 1-12 | 0 | 0 | 0 | 0 | 1-12 |
| 6413(2) | 0 | 8-11 | 0 | 0 | 1-7,12-15 | 0 | 8 | 0 | 7,9 | 1-6,10-15 |
| 6423(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7778(2) | 1-4 | 5 | 6 | 7-8 | 9-15 | 1-2 | 4 | 3 | 5,6 | 7-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7778(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6421(2) | 0 | 0 | 0 | 4 | 1-3,5-15 | 1-4 | 0 | 0 | 5 | 6-15 |
| 6421(2) | 1,2 | 3,4 | 5 | 6-8 | 9-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7796(3) | 0 | 0 | 0 | 0 | 1-15 | 0 | 6 | 0 | 5,7-9 | 1-4,10-15 |
| 7796(3) | 4 | 1-3,5 | 6 | 7,8 | 9-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754(3) | 1-5 | 6 | 0 | 7-9 | 10-15 | 1-5 | 6,7 | 0 | 0 | 8-15 |
| 7754(3) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754(2) | 1-3,15 | 9,11-14 | 6-8,10 | 4,5 | 0 | 0 | 0 | 0 | 1,2 | 3-15 |
| 7754(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6421 | 1-4 | 5 | 6 | 7-11 | 12-15 | 1-4 | 5 | 0 | 8,9 | 6,7,10-15 |
| 6421 | 0 | 0 | 0 | 0 | 1-15 | 1-7 | 8 | 9 | 0 | 10-15 |
| 6413 | 1-5 | 6 | 7 | 8 | 9-15 | 1-4 | 5-8 | 9 | 10 | 11-15 |
| 6413 | 1 | 2 | 0 | 3-5,7,13 | 6,8-12,14,15 | 1,2 | 3-6 | 0 | 7 | 8-15 |
| 7777(2) | 1-3 | 4,8-11 | 0 | 7,12-15 | 5,6 | 1-5 | 6 | 8-11 | 7,12,15 | 13,14 |
| 7777(2) | 1,3 | 2 | 4,12-15 | 5,9-11 | 6-8 | 0 | 0 | 0 | 0 | 1-15 |
| 7758(2) | 1-3 | 0 | 4 | 5 | 6-15 | 1-4 | 5 | 6,7 | 0 | 8-15 |
| 7758(2) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 7 | 4-6,8,9,12,13 | 1-3,10,11,14,15 |
| 7758(3) | 0 | 0 | 0 | 6,5 | 1-4,7-15 | 1-4 | 5 | 6,7 | 0 | 8-15 |
| 7758(3) | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7758 | 1,2 | 3 | 4 | 5-7 | 8-15 | 1-3 | 0 | 4,5 | 6,9-12,15 | 7,8 |
| 7758 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7778 | 0 | 3-5,8,9 | 12 | 10,11,13-15 | 1,6,7 | 4-6 | 0 | 3,7,9,11 | 10,12,13 | 1,2,5,8,14 |
| 7778 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 5781 | 1-7 | 0 | 0 | 8 | 9-15 | 0 | 0 | 0 | 1-3,6-8 | 4,5,9-15 |
| 5781 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7764 | 0 | 0 | 0 | 5,6,11,12,14,15 | 1-4,7-10,13 | 0 | 5 | 0 | 4 | 1-3,6-15 |
| 7764 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7786 | 1,2 | 3-6 | 0 | 7 | 8-15 | 1 | 2,3 | 0 | 0 | 4-15 |
| 7786 | 1,3-5 | 2,6,7 | 8,9 | 0 | 10-15 | 1 | 2,3 | 0 | 4,5 | 6-15 |
| 7777 | 1-5 | 6,7,14,15 | 0 | 0 | 8-13 | 1-4 | 5 | 12-14 | 0 | 6-11,15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7777 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6531 | 1-3 | 4,5 | 0 | 6 | 7-15 | 1-3 | 4 | 5 | 6 | 7-15 |
| 6531 | 0 | 0 | 0 | 0 | 1-15 | 1-4 | 5-7 | 0 | 0 | 8-15 |
| 7754 | N/A | N/A | N/A | N/A | N/A | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7796(2) | 1-5 | 6,7 | 0 | 8 | 9-15 | 0 | 3 | 5 | 4,7-9 | 1,2,10-15 |
| 7796(2) | 0 | 1,2 | 0 | 0 | 3-15 | 0 | 0 | 1,2,5-15 | 0 | 3,4 |
| 7796 | 0 | 0 | 0 | 3,4 | 1,2,5-15 | 1-3 | 0 | 0 | 4-6 | 7-15 |
| 7796 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |

***Table 5. Ground Cover Measurements from Scaled Quail (Callipepla squamata)) Hen Nest Sites (n=35) and Paired Random Locations in the Southern High Plains of Texas***

| Bird-ID | Litter % Center | Grass % Center | Forbs % Center | Bare % Center | Shrubs % Center | Litter Depth (cm) | Tallest Plant (cm) | Exotic |
|---|---|---|---|---|---|---|---|---|
| 6794 | 35 | 5 | 0 | 5 | 55 | 2 | 38 | 0 |
| 6794 | 5 | 20 | 25 | 50 | 0 | 1 | 36 | 0 |
| 7616 | 15 | 0 | 10 | 0 | 75 | 2 | 66 | 0 |
| 7616 | 5 | 45 | 0 | 50 | 0 | 1 | 24 | 0 |
| 7694 | 5 | 5 | 0 | 0 | 90 | 1 | 69 | 0 |
| 7694 | 0 | 40 | 10 | 50 | 0 | 0 | 20 | 0 |
| 6762 | 15 | 5 | 5 | 5 | 70 | 4 | 80 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 0 | 10 | 0 | 0 | 90 | 0 | 72 | 0 |
| 7612 | 10 | 80 | 0 | 10 | 0 | 2 | 49 | 0 |
| 6755 | 10 | 5 | 5 | 10 | 70 | 1 | 68 | 0 |
| 6755 | 10 | 50 | 35 | 0 | 5 | 2 | 51 | 0 |
| 7616(2) | 10 | 75 | 5 | 10 | 0 | 1 | 92 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7616(2) | 5 | 15 | 20 | 60 | 0 | 1 | 80 | 0 |
| 6776 | 10 | 15 | 0 | 5 | 70 | 1 | 52 | 0 |
| 6776 | 0 | 20 | 5 | 75 | 0 | 0 | 33 | 0 |
| 7612(2) | 20 | 30 | 20 | 0 | 30 | 4 | 51 | 0 |
| 7612(2) | 5 | 10 | 20 | 65 | 0 | 10 | 37 | 0 |
| 5711 | 20 | 40 | 10 | 0 | 30 | 3 | 43 | 0 |
| 5711 | 20 | 10 | 50 | 20 | 0 | 1 | 71 | 0 |
| 6784 | 0 | 0 | 0 | 0 | 100 | 0 | 62 | 0 |
| 6784 | 5 | 40 | 5 | 50 | 0 | 1 | 91 | 0 |
| 6786 | 10 | 0 | 20 | 40 | 30 | 1 | 104 | 0 |
| 6786 | 0 | 20 | 5 | 75 | 0 | 0 | 32 | 0 |
| 6788 | 0 | 25 | 25 | 0 | 50 | 0 | 113 | 0 |
| 6788 | 5 | 70 | 5 | 20 | 0 | 1 | 44 | 0 |
| 6793 | 0 | 90 | 5 | 5 | 0 | 0 | 72 | 0 |
| 6793 | 0 | 80 | 15 | 5 | 0 | 0 | 71 | 0 |
| 6413(2) | 15 | 0 | 0 | 0 | 85 | 100 | 1130 | 0 |
| 6423(2) | 35 | 45 | 5 | 15 | 0 | 70 | 550 | 0 |
| 7778(2) | 5 | 15 | 5 | 0 | 75 | 20 | 760 | 0 |
| 7778(2) | 35 | 40 | 5 | 15 | 5 | 5 | 325 | 0 |
| 6421(2) | 10 | 30 | 15 | 5 | 40 | 5 | 730 | 0 |
| 6421(2) | 45 | 25 | 10 | 5 | 15 | 80 | 525 | 0 |
| 7796(3) | 20 | 20 | 15 | 5 | 40 | 25 | 1090 | 0 |
| 7796(3) | 15 | 55 | 0 | 30 | 0 | 35 | 530 | 0 |
| 7754(3) | 20 | 0 | 0 | 0 | 80 | 10 | 1130 | 0 |
| 7754(3) | 15 | 55 | 0 | 30 | 0 | 5 | 170 | 0 |
| 7754(2) | 20 | 15 | 0 | 5 | 60 | 25 | 230 | 0 |
| 7754(2) | 20 | 60 | 15 | 5 | 0 | 15 | 650 | 0 |
| 6421 | 10 | 5 | 0 | 0 | 85 | 45 | 685 | 0 |
| 6421 | 25 | 65 | 5 | 5 | 0 | 5 | 720 | 0 |
| 6413 | 15 | 0 | 0 | 0 | 85 | 45 | 975 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6413 | 35 | 5 | 25 | 5 | 30 | 100 | 290 | 0 |
| 7777(2) | 20 | 0 | 5 | 0 | 0 | 90 | 830 | 75 |
| 7777(2) | 50 | 25 | 0 | 25 | 0 | 10 | 190 | 0 |
| 7758(2) | 0 | 20 | 5 | 5 | 70 | 0 | 665 | 0 |
| 7758(2) | 15 | 25 | 55 | 0 | 0 | 15 | 1090 | 5 |
| 7758(3) | 10 | 30 | 10 | 5 | 50 | 20 | 670 | 0 |
| 7758(3) | 10 | 65 | 5 | 20 | 0 | 2 | 520 | 0 |
| 7758 | 15 | 0 | 20 | 0 | 65 | 8 | 590 | 0 |
| 7758 | 15 | 20 | 10 | 55 | 0 | 20 | 325 | 0 |
| 7778 | 50 | 0 | 0 | 0 | 50 | 70 | 7.5ft | 0 |
| 7778 | 20 | 25 | 5 | 50 | 0 | 15 | 140 | 0 |
| 5781 | 10 | 10 | 5 | 5 | 70 | 1 | 760 | 0 |
| 5781 | 5 | 30 | 25 | 40 | 0 | 1 | 65 | 0 |
| 7764 | 20 | 40 | 0 | 5 | 0 | 35 | 7ft | 35 |
| 7764 | 10 | 65 | 25 | 0 | 0 | 3 | 600 | 0 |
| 7786 | 0 | 10 | 0 | 5 | 85 | 0 | 800 | 0 |
| 7786 | 20 | 0 | 60 | 20 | 0 | 10 | 603 | 0 |
| 7777 | 0 | 5 | 0 | 5 | 90 | 0 | 7ft | 0 |
| 7777 | 20 | 40 | 25 | 15 | 0 | 28 | 609 | 0 |
| 6531 | 5 | 20 | 0 | 10 | 65 | 30 | 890 | 0 |
| 6531 | 0 | 85 | 5 | 5 | 0 | 0 | 310 | 0 |
| 7754 | 0 | 100 | 0 | 0 | 0 | 0 | 940 | 0 |
| 7754 | 0 | 25 | 5 | 70 | 0 | 0 | 111 | 0 |
| 7796(2) | 5 | 20 | 0 | 0 | 75 | 10 | 660 | 0 |
| 7796(2) | 5 | 50 | 25 | 20 | 0 | 5 | 320 | 0 |
| 7796 | 5 | 45 | 10 | 10 | 30 | 3 | 780 | 0 |
| 7796 | 0 | 45 | 15 | 40 | 0 | 0 | 110 | 0 |

| Bird-ID | Litter % 1m N | Grass % 1m N | Forbs % 1m N | Bare % 1m N | Shrubs % 1m N | Litter Depth (cm) 1m N | Tallest Plant (cm) 1m N | Exotic 1m N |
|---|---|---|---|---|---|---|---|---|
| 6794 | 40 | 15 | 0 | 20 | 25 | 1 | 39 | 0 |
| 6794 | 5 | 50 | 15 | 30 | 0 | 1 | 35 | 0 |
| 7616 | 40 | 10 | 35 | 15 | 0 | 2 | 33 | 0 |
| 7616 | 5 | 35 | 35 | 25 | 0 | 10 | 47 | 0 |
| 7694 | 0 | 0 | 40 | 0 | 50 | 2 | 65 | 0 |
| 7694 | 10 | 30 | 50 | 10 | 0 | 1 | 30 | 0 |
| 6762 | 55 | 30 | 10 | 0 | 0 | 2 | 24 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 30 | 60 | 0 | 10 | 0 | 2 | 33 | 0 |
| 7612 | 5 | 65 | 10 | 20 | 0 | 2 | 42 | 0 |
| 6755 | 10 | 10 | 10 | 40 | 30 | 1 | 41 | 0 |
| 6755 | 30 | 25 | 25 | 0 | 20 | 2 | 58 | 0 |
| 7616(2) | 5 | 60 | 10 | 20 | 5 | 1 | 107 | 0 |
| 7616(2) | 5 | 15 | 10 | 80 | 0 | 1 | 42 | 0 |
| 6776 | 5 | 50 | 0 | 15 | 30 | 1 | 30 | 0 |
| 6776 | 5 | 60 | 0 | 35 | 0 | 1 | 32 | 0 |
| 7612(2) | 15 | 85 | 0 | 0 | 0 | 3 | 39 | 0 |
| 7612(2) | 5 | 5 | 25 | 65 | 0 | 1 | 19 | 0 |
| 5711 | 10 | 25 | 40 | 0 | 25 | 3 | 50 | 0 |
| 5711 | 10 | 5 | 75 | 10 | 0 | 1 | 81 | 0 |
| 6784 | 30 | 0 | 0 | 15 | 55 | 3 | 72 | 0 |
| 6784 | 5 | 60 | 5 | 30 | 0 | 1 | 64 | 0 |
| 6786 | 20 | 60 | 0 | 0 | 20 | 1 | 40 | 0 |
| 6786 | 0 | 35 | 15 | 0 | 50 | 0 | 94 | 0 |
| 6788 | 10 | 20 | 15 | 20 | 35 | 3 | 68 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6788 | 50 | 85 | 5 | 5 | 0 | 1 | 37 | 0 |
| 6793 | 10 | 45 | 40 | 5 | 0 | 1 | 60 | 0 |
| 6793 | 0 | 90 | 5 | 5 | 0 | 0 | 75 | 0 |
| 6413(2) | 20 | 55 | 10 | 15 | 0 | 60 | 550 | 0 |
| 6423(2) | 20 | 25 | 5 | 50 | 0 | 10 | 355 | 0 |
| 7778(2) | 10 | 60 | 5 | 0 | 25 | 3 | 360 | 0 |
| 7778(2) | 20 | 65 | 10 | 0 | 5 | 35 | 650 | 0 |
| 6421(2) | 20 | 35 | 25 | 20 | 0 | 30 | 210 | 0 |
| 6421(2) | 15 | 35 | 20 | 0 | 30 | 150 | 545 | 0 |
| 7796(3) | 20 | 30 | 0 | 5 | 45 | 60 | 690 | 0 |
| 7796(3) | 15 | 55 | 10 | 20 | 0 | 25 | 510 | 0 |
| 7754(3) | 5 | 40 | 10 | 10 | 35 | 30 | 70 | 0 |
| 7754(3) | 20 | 40 | 0 | 40 | 0 | 10 | 220 | 0 |
| 7754(2) | 25 | 70 | 5 | 0 | 0 | 20 | 450 | 0 |
| 7754(2) | 25 | 55 | 15 | 5 | 0 | 10 | 760 | 0 |
| 6421 | 40 | 15 | 10 | 25 | 10 | 15 | 780 | 0 |
| 6421 | 60 | 20 | 10 | 10 | 0 | 55 | 380 | 0 |
| 6413 | 35 | 10 | 5 | 0 | 50 | 100 | 785 | 0 |
| 6413 | 20 | 5 | 30 | 15 | 30 | 50 | 480 | 0 |
| 7777(2) | 70 | 15 | 10 | 0 | 0 | 60 | 450 | 5 |
| 7777(2) | 25 | 20 | 0 | 55 | 0 | 30 | 210 | 0 |
| 7758(2) | 15 | 35 | 10 | 20 | 20 | 30 | 450 | 0 |
| 7758(2) | 15 | 40 | 35 | 10 | 0 | 30 | 980 | 0 |
| 7758(3) | 10 | 35 | 0 | 30 | 25 | 10 | 860 | 0 |
| 7758(3) | 5 | 55 | 20 | 20 | 0 | 1 | 420 | 0 |
| 7758 | 15 | 30 | 5 | 10 | 40 | 20 | 731 | 0 |
| 7758 | 20 | 50 | 10 | 20 | 0 | 10 | 330 | 0 |
| 7778 | 30 | 60 | 10 | 0 | 0 | 35 | 420 | 0 |
| 7778 | 30 | 25 | 10 | 35 | 0 | 15 | 150 | 0 |
| 5781 | 5 | 55 | 10 | 10 | 20 | 1 | 590 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 5781 | 20 | 25 | 10 | 45 | 0 | 1 | 120 | 0 |
| 7764 | 20 | 40 | 0 | 0 | 0 | 35 | 6.5ft | 40 |
| 7764 | 10 | 60 | 30 | 0 | 0 | 5 | 711 | 0 |
| 7786 | 5 | 40 | 10 | 45 | 0 | 10 | 440 | 0 |
| 7786 | 80 | 10 | 15 | 0 | 5 | 5 | 480 | 0 |
| 7777 | 0 | 95 | 0 | 5 | 0 | 0 | 640 | 0 |
| 7777 | 10 | 50 | 15 | 10 | 15 | 5 | 810 | 0 |
| 6531 | 5 | 80 | 5 | 5 | 5 | 20 | 100 | 0 |
| 6531 | 0 | 50 | 5 | 45 | 0 | 0 | 572 | 0 |
| 7754 | 0 | 50 | 0 | 40 | 10 | 0 | 200 | 0 |
| 7754 | 0 | 25 | 5 | 70 | 0 | 0 | 185 | 0 |
| 7796(2) | 30 | 35 | 10 | 25 | 0 | 3 | 175 | 0 |
| 7796(2) | 10 | 55 | 25 | 10 | 0 | 15 | 340 | 0 |
| 7796 | 5 | 55 | 10 | 25 | 5 | 1 | 270 | 0 |
| 7796 | 0 | 50 | 30 | 20 | 0 | 0 | 432 | 0 |

| **Bird-ID** | **Litter % 1m E** | **Grass % 1m E** | **Forbs % 1m E** | **Bare % 1m E** | **Shrubs % 1m E** | **Litter Depth (cm) 1m E** | **Tallest Plant (cm) 1m E** | **Exotic 1m E** |
|---|---|---|---|---|---|---|---|---|
| 6794 | 5 | 55 | 30 | 10 | 0 | 1 | 24 | 0 |
| 6794 | 0 | 10 | 70 | 20 | 0 | 0 | 18 | 0 |
| 7616 | 5 | 10 | 25 | 60 | 0 | 1 | 34 | 0 |
| 7616 | 5 | 60 | 10 | 25 | 0 | 1 | 32 | 0 |
| 7694 | 20 | 10 | 35 | 0 | 35 | 2 | 60 | 0 |
| 7694 | 0 | 40 | 45 | 15 | 0 | 0 | 33 | 0 |
| 6762 | 40 | 5 | 30 | 0 | 25 | 5 | 55 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 20 | 15 | 65 | 0 | 0 | 2 | 29 | 0 |
| 7612 | 25 | 65 | 10 | 0 | 0 | 2 | 37 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6755 | 5 | 5 | 55 | 10 | 25 | 1 | 48 | 0 |
| 6755 | 5 | 60 | 5 | 30 | 0 | 1 | 29 | 0 |
| 7616(2) | 5 | 75 | 5 | 15 | 0 | 1 | 85 | 0 |
| 7616(2) | 0 | 40 | 10 | 50 | 0 | 0 | 78 | 0 |
| 6776 | 10 | 35 | 0 | 5 | 50 | 1 | 116 | 0 |
| 6776 | 5 | 45 | 0 | 50 | 0 | 1 | 30 | 0 |
| 7612(2) | 5 | 75 | 20 | 0 | 0 | 1 | 66 | 0 |
| 7612(2) | 30 | 10 | 15 | 45 | 0 | 2 | 43 | 0 |
| 5711 | 35 | 35 | 5 | 5 | 20 | 4 | 35 | 0 |
| 5711 | 0 | 10 | 70 | 20 | 0 | 0 | 31 | 0 |
| 6784 | 80 | 0 | 0 | 0 | 20 | 30 | 53 | 0 |
| 6784 | 0 | 25 | 5 | 70 | 0 | 0 | 34 | 0 |
| 6786 | 0 | 40 | 15 | 0 | 45 | 0 | 63 | 0 |
| 6786 | 0 | 5 | 5 | 75 | 15 | 0 | 37 | 0 |
| 6788 | 0 | 45 | 35 | 10 | 10 | 0 | 53 | 0 |
| 6788 | 5 | 90 | 0 | 5 | 0 | 2 | 54 | 0 |
| 6793 | 0 | 65 | 25 | 10 | 0 | 0 | 60 | 0 |
| 6793 | 10 | 80 | 10 | 0 | 0 | 2 | 54 | 0 |
| 6413(2) | 35 | 40 | 25 | 0 | 0 | 90 | 595 | 0 |
| 6423(2) | 55 | 45 | 0 | 0 | 0 | 30 | 500 | 0 |
| 7778(2) | 35 | 35 | 20 | 10 | 0 | 35 | 550 | 0 |
| 7778(2) | 20 | 30 | 0 | 50 | 0 | 2 | 360 | 0 |
| 6421(2) | 20 | 5 | 5 | 10 | 60 | 10 | 885 | 0 |
| 6421(2) | 20 | 25 | 30 | 15 | 10 | 45 | 370 | 0 |
| 7796(3) | 10 | 85 | 0 | 5 | 0 | 2 | 755 | 0 |
| 7796(3) | 5 | 30 | 0 | 65 | 0 | 10 | 470 | 0 |
| 7754(3) | 15 | 45 | 15 | 10 | 15 | 30 | 305 | 0 |
| 7754(3) | 10 | 75 | 0 | 15 | 0 | 5 | 240 | 0 |
| 7754(2) | 15 | 50 | 35 | 0 | 0 | 5 | 450 | 0 |
| 7754(2) | 20 | 55 | 5 | 10 | 0 | 10 | 180 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6421 | 25 | 30 | 5 | 35 | 5 | 20 | 420 | 0 |
| 6421 | 65 | 15 | 15 | 5 | 0 | 45 | 745 | 0 |
| 6413 | 45 | 20 | 10 | 15 | 10 | 35 | 320 | 0 |
| 6413 | 10 | 25 | 30 | 20 | 15 | 60 | 455 | 0 |
| 7777(2) | 50 | 20 | 5 | 0 | 0 | 80 | 350 | 25 |
| 7777(2) | 40 | 20 | 10 | 30 | 0 | 20 | 350 | 0 |
| 7758(2) | 5 | 20 | 5 | 60 | 10 | 8 | 280 | 0 |
| 7758(2) | 30 | 40 | 30 | 0 | 0 | 40 | 805 | 0 |
| 7758(3) | 10 | 65 | 5 | 20 | 0 | 30 | 850 | 0 |
| 7758(3) | 5 | 55 | 5 | 35 | 0 | 20 | 300 | 0 |
| 7758 | 15 | 25 | 10 | 20 | 30 | 25 | 480 | 0 |
| 7758 | 20 | 30 | 5 | 45 | 0 | 20 | 490 | 0 |
| 7778 | 60 | 10 | 5 | 0 | 25 | 50 | 730 | 0 |
| 7778 | 15 | 60 | 10 | 0 | 15 | 20 | 370 | 0 |
| 5781 | 5 | 40 | 5 | 25 | 25 | 1 | 580 | 0 |
| 5781 | 20 | 65 | 10 | 15 | 0 | 1 | 90 | 0 |
| 7764 | 0 | 25 | 75 | 0 | 0 | 2 | 130 | 0 |
| 7764 | 5 | 50 | 40 | 0 | 5 | 15 | 740 | 0 |
| 7786 | 5 | 80 | 10 | 0 | 5 | 10 | 850 | 0 |
| 7786 | 80 | 5 | 15 | 20 | 0 | 10 | 180 | 0 |
| 7777 | 95 | 0 | 0 | 5 | 0 | 20 | 280 | 0 |
| 7777 | 30 | 30 | 30 | 10 | 0 | 10 | 370 | 0 |
| 6531 | 5 | 45 | 5 | 15 | 30 | 10 | 460 | 0 |
| 6531 | 0 | 15 | 10 | 75 | 0 | 0 | 160 | 0 |
| 7754 | 5 | 45 | 0 | 40 | 10 | 1 | 1100 | 0 |
| 7754 | 0 | 10 | 10 | 80 | 0 | 0 | 120 | 0 |
| 7796(2) | 20 | 65 | 10 | 5 | 0 | 4 | 602 | 0 |
| 7796(2) | 15 | 25 | 25 | 35 | 0 | 2 | 295 | 0 |
| 7796 | 20 | 60 | 5 | 15 | 0 | 5 | 221 | 0 |
| 7796 | 0 | 65 | 10 | 10 | 15 | 0 | 430 | 0 |

| Bird-ID | Litter % 1m S | Grass % 1m S | Forbs % 1m S | Bare % 1m S | Shrubs % 1mS | Litter Depth (cm) 1m S | Tallest Plant (cm) 1m S | Exotic 1m S |
|---|---|---|---|---|---|---|---|---|
| 6794 | 20 | 50 | 10 | 20 | 0 | 1 | 54 | 0 |
| 6794 | 5 | 10 | 20 | 65 | 0 | 1 | 32 | 0 |
| 7616 | 5 | 25 | 30 | 40 | 0 | 1 | 32 | 0 |
| 7616 | 5 | 25 | 5 | 65 | 0 | 1 | 24 | 0 |
| 7694 | 5 | 20 | 70 | 5 | 0 | 1 | 51 | 0 |
| 7694 | 0 | 40 | 25 | 35 | 0 | 0 | 33 | 0 |
| 6762 | 20 | 55 | 20 | 5 | 0 | 3 | 41 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 5 | 35 | 10 | 50 | 0 | 1 | 30 | 0 |
| 7612 | 15 | 45 | 15 | 25 | 0 | 1 | 43 | 0 |
| 6755 | 10 | 20 | 10 | 5 | 55 | 1 | 56 | 0 |
| 6755 | 20 | 50 | 20 | 5 | 5 | 2 | 64 | 0 |
| 7616(2) | 5 | 20 | 15 | 60 | 0 | 2 | 71 | 0 |
| 7616(2) | 0 | 25 | 20 | 55 | 0 | 0 | 100 | 0 |
| 6776 | 5 | 15 | 0 | 0 | 80 | 1 | 82 | 0 |
| 6776 | 0 | 75 | 0 | 25 | 0 | 0 | 24 | 0 |
| 7612(2) | 0 | 60 | 40 | 0 | 0 | 2 | 41 | 0 |
| 7612(2) | 0 | 10 | 25 | 65 | 0 | 0 | 38 | 0 |
| 5711 | 0 | 50 | 20 | 5 | 25 | 0 | 41 | 0 |
| 5711 | 5 | 10 | 60 | 25 | 0 | 1 | 85 | 0 |
| 6784 | 20 | 5 | 10 | 15 | 50 | 2 | 55 | 0 |
| 6784 | 5 | 15 | 10 | 70 | 0 | 1 | 71 | 0 |
| 6786 | 5 | 15 | 65 | 15 | 0 | 1 | 35 | 0 |
| 6786 | 0 | 30 | 65 | 5 | 0 | 0 | 67 | 0 |
| 6788 | 40 | 10 | 10 | 0 | 40 | 5 | 61 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6788 | 5 | 85 | 5 | 5 | 0 | 1 | 37 | 0 |
| 6793 | 0 | 80 | 10 | 10 | 0 | 0 | 59 | 0 |
| 6793 | 0 | 65 | 10 | 25 | 0 | 0 | 87 | 0 |
| 6413(2) | 20 | 55 | 25 | 0 | 0 | 60 | 655 | 0 |
| 6423(2) | 25 | 50 | 10 | 15 | 0 | 10 | 590 | 0 |
| 7778(2) | 20 | 35 | 25 | 5 | 15 | 80 | 520 | 0 |
| 7778(2) | 35 | 55 | 0 | 10 | 0 | 15 | 370 | 0 |
| 6421(2) | 10 | 30 | 35 | 5 | 20 | 10 | 565 | 0 |
| 6421(2) | 25 | 45 | 15 | 15 | 0 | 25 | 1085 | 0 |
| 7796(3) | 20 | 70 | 0 | 10 | 0 | 20 | 485 | 0 |
| 7796(3) | 5 | 35 | 0 | 60 | 0 | 10 | 370 | 0 |
| 7754(3) | 10 | 40 | 20 | 15 | 15 | 30 | 775 | 0 |
| 7754(3) | 5 | 85 | 0 | 10 | 0 | 10 | 445 | 0 |
| 7754(2) | 55 | 10 | 35 | 0 | 0 | 20 | 280 | 0 |
| 7754(2) | 20 | 60 | 15 | 5 | 0 | 15 | 780 | 0 |
| 6421 | 15 | 10 | 0 | 0 | 75 | 45 | 915 | 0 |
| 6421 | 20 | 70 | 5 | 5 | 0 | 25 | 630 | 0 |
| 6413 | 45 | 45 | 5 | 0 | 5 | 40 | 160 | 0 |
| 6413 | 40 | 30 | 5 | 10 | 15 | 55 | 475 | 0 |
| 7777(2) | 95 | 0 | 5 | 0 | 0 | 120 | 325 | 0 |
| 7777(2) | 35 | 50 | 0 | 5 | 0 | 25 | 415 | 10 |
| 7758(2) | 10 | 20 | 10 | 60 | 0 | 8 | 345 | 0 |
| 7758(2) | 15 | 40 | 40 | 5 | 0 | 30 | 1060 | 0 |
| 7758(3) | 10 | 70 | 10 | 10 | 0 | 65 | 890 | 0 |
| 7758(3) | 10 | 45 | 5 | 40 | 0 | 10 | 610 | 0 |
| 7758 | 15 | 25 | 10 | 20 | 30 | 30 | 805 | 0 |
| 7758 | 35 | 35 | 5 | 25 | 0 | 80 | 285 | 0 |
| 7778 | 55 | 25 | 10 | 0 | 10 | 80 | 308 | 0 |
| 7778 | 10 | 5 | 15 | 60 | 10 | 15 | 110 | 0 |
| 5781 | 15 | 5 | 10 | 10 | 60 | 35 | 650 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 5781 | 15 | 60 | 10 | 15 | 0 | 15 | 105 | 0 |
| 7764 | 35 | 40 | 5 | 10 | 0 | 2 | 570 | 10 |
| 7764 | 20 | 40 | 20 | 20 | 0 | 50 | 490 | 0 |
| 7786 | 10 | 30 | 20 | 15 | 25 | 10 | 603 | 0 |
| 7786 | 15 | 5 | 10 | 50 | 20 | 20 | 602 | 0 |
| 7777 | 25 | 5 | 70 | 0 | 0 | 20 | 685 | 0 |
| 7777 | 10 | 40 | 45 | 0 | 5 | 30 | 530 | 0 |
| 6531 | 0 | 65 | 0 | 5 | 30 | 0 | 460 | 0 |
| 6531 | 0 | 80 | 10 | 5 | 5 | 0 | 310 | 0 |
| 7754 | 0 | 60 | 5 | 35 | 0 | 0 | 680 | 0 |
| 7754 | 0 | 10 | 5 | 85 | 0 | 0 | 89 | 0 |
| 7796(2) | 15 | 15 | 20 | 50 | 0 | 5 | 330 | 0 |
| 7796(2) | 10 | 55 | 15 | 0 | 20 | 10 | 950 | 0 |
| 7796 | 20 | 45 | 15 | 20 | 0 | 1 | 660 | 0 |
| 7796 | 15 | 50 | 15 | 20 | 0 | 2 | 440 | 0 |

| **Bird-ID** | **Litter % 1m W** | **Grass % 1m W** | **Forbs % 1m W** | **Bare % 1m W** | **Shrubs % 1m W** | **Litter Depth (cm) 1m W** | **Tallest Plant (cm) 1m W** | **Exotic 1m W** |
|---|---|---|---|---|---|---|---|---|
| 6794 | 80 | 5 | 15 | 0 | 0 | 4 | 38 | 0 |
| 6794 | 5 | 30 | 0 | 65 | 0 | 1 | 17 | 0 |
| 7616 | 40 | 10 | 45 | 5 | 0 | 2 | 32 | 0 |
| 7616 | 5 | 35 | 30 | 30 | 0 | 2 | 47 | 0 |
| 7694 | 10 | 10 | 60 | 0 | 20 | 3 | 69 | 0 |
| 7694 | 10 | 30 | 30 | 30 | 0 | 1 | 28 | 0 |
| 6762 | 55 | 15 | 25 | 5 | 0 | 2 | 28 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 5 | 60 | 5 | 30 | 0 | 1 | 31 | 0 |
| 7612 | 5 | 35 | 20 | 40 | 0 | 1 | 33 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6755 | 20 | 20 | 20 | 10 | 30 | 1 | 42 | 0 |
| 6755 | 20 | 5 | 5 | 0 | 70 | 1 | 63 | 0 |
| 7616(2) | 10 | 65 | 10 | 15 | 0 | 1 | 109 | 0 |
| 7616(2) | 5 | 25 | 15 | 55 | 0 | 1 | 69 | 0 |
| 6776 | 0 | 90 | 0 | 10 | 0 | 0 | 36 | 0 |
| 6776 | 5 | 20 | 0 | 75 | 0 | 1 | 32 | 0 |
| 7612(2) | 0 | 75 | 5 | 0 | 20 | 0 | 99 | 0 |
| 7612(2) | 10 | 10 | 30 | 50 | 0 | 1 | 16 | 0 |
| 5711 | 0 | 55 | 20 | 0 | 25 | 0 | 56 | 0 |
| 5711 | 15 | 20 | 55 | 10 | 0 | 2 | 81 | 0 |
| 6784 | 50 | 0 | 0 | 0 | 50 | 26 | 60 | 0 |
| 6784 | 5 | 10 | 5 | 80 | 0 | 1 | 26 | 0 |
| 6786 | 5 | 35 | 25 | 35 | 0 | 1 | 66 | 0 |
| 6786 | 0 | 3 | 2 | 95 | 0 | 0 | 5 | 0 |
| 6788 | 10 | 10 | 40 | 0 | 40 | 1 | 77 | 0 |
| 6788 | 5 | 45 | 10 | 40 | 0 | 1 | 54 | 0 |
| 6793 | 5 | 60 | 25 | 10 | 0 | 1 | 37 | 0 |
| 6793 | 10 | 80 | 5 | 5 | 0 | 2 | 63 | 0 |
| 6413(2) | 20 | 70 | 0 | 10 | 0 | 35 | 535 | 0 |
| 6423(2) | 20 | 25 | 10 | 45 | 0 | 25 | 450 | 0 |
| 7778(2) | 20 | 40 | 30 | 0 | 10 | 10 | 425 | 0 |
| 7778(2) | 20 | 50 | 5 | 25 | 0 | 20 | 370 | 0 |
| 6421(2) | 10 | 50 | 10 | 5 | 25 | 3 | 600 | 0 |
| 6421(2) | 35 | 35 | 20 | 10 | 0 | 20 | 410 | 0 |
| 7796(3) | 30 | 40 | 5 | 25 | 0 | 50 | 610 | 0 |
| 7796(3) | 10 | 40 | 5 | 45 | 0 | 25 | 630 | 0 |
| 7754(3) | 35 | 10 | 0 | 0 | 55 | 130 | 665 | 0 |
| 7754(3) | 10 | 70 | 0 | 20 | 0 | 10 | 150 | 0 |
| 7754(2) | 20 | 30 | 10 | 25 | 15 | 2 | 390 | 0 |
| 7754(2) | 35 | 35 | 15 | 10 | 5 | 5 | 970 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6421 | 25 | 0 | 5 | 0 | 70 | 75 | 1010 | 0 |
| 6421 | 35 | 45 | 20 | 0 | 0 | 50 | 830 | 0 |
| 6413 | 55 | 5 | 10 | 0 | 30 | 80 | 890 | 0 |
| 6413 | 15 | 15 | 35 | 20 | 15 | 40 | 460 | 0 |
| 7777(2) | 30 | 0 | 0 | 0 | 0 | 530 | 560 | 70 |
| 7777(2) | 30 | 15 | 0 | 55 | 0 | 80 | 175 | 0 |
| 7758(2) | 40 | 10 | 20 | 10 | 20 | 20 | 650 | 0 |
| 7758(2) | 35 | 15 | 25 | 0 | 0 | 190 | 1020 | 25 |
| 7758(3) | 5 | 10 | 0 | 5 | 80 | 25 | 650 | 0 |
| 7758(3) | 5 | 30 | 10 | 55 | 0 | 3 | 445 | 0 |
| 7758 | 20 | 20 | 5 | 5 | 50 | 55 | 730 | 0 |
| 7758 | 25 | 40 | 5 | 25 | 5 | 50 | 175 | 0 |
| 7778 | 30 | 60 | 10 | 0 | 0 | 45 | 39 | 0 |
| 7778 | 10 | 25 | 20 | 30 | 15 | 15 | 300 | 0 |
| 5781 | 0 | 55 | 20 | 5 | 20 | 0 | 490 | 0 |
| 5781 | 30 | 30 | 15 | 25 | 0 | 2 | 55 | 0 |
| 7764 | 30 | 65 | 5 | 0 | 0 | 2 | 120 | 0 |
| 7764 | 10 | 75 | 75 | 0 | 0 | 30 | 65 | 0 |
| 7786 | 20 | 25 | 10 | 30 | 5 | 5 | 900 | 0 |
| 7786 | 45 | 10 | 20 | 20 | 15 | 10 | 560 | 0 |
| 7777 | 20 | 45 | 25 | 40 | 0 | 15 | 530 | 0 |
| 7777 | 10 | 10 | 80 | 0 | 0 | 10 | 630 | 0 |
| 6531 | 5 | 55 | 20 | 0 | 20 | 20 | 760 | 0 |
| 6531 | 5 | 40 | 30 | 25 | 0 | 10 | 620 | 0 |
| 7754 | 0 | 45 | 0 | 50 | 5 | 0 | 690 | 0 |
| 7754 | 0 | 5 | 5 | 90 | 0 | 0 | 280 | 0 |
| 7796(2) | 10 | 70 | 5 | 5 | 10 | 1 | 470 | 0 |
| 7796(2) | 5 | 10 | 15 | 70 | 0 | 2 | 530 | 0 |
| 7796 | 10 | 15 | 15 | 50 | 10 | 3 | 900 | 0 |
| 7796 | 5 | 35 | 20 | 35 | 5 | 2 | 308 | 0 |

| Bird-ID | Litter % 5m N | Grass % 5m N | Forbs % 5m N | Bare % 5m N | Shrubs % 5m N | Litter Depth (cm) 5m N | Tallest Plant (cm) 5m N | Exotic 5m N |
|---|---|---|---|---|---|---|---|---|
| 6794 | 20 | 10 | 10 | 60 | 0 | 1 | 30 | 0 |
| 6794 | 40 | 50 | 5 | 5 | 0 | 2 | 30 | 0 |
| 7616 | 5 | 5 | 30 | 50 | 10 | 1 | 49 | 0 |
| 7616 | 10 | 45 | 5 | 40 | 0 | 1 | 25 | 0 |
| 7694 | 10 | 0 | 10 | 5 | 75 | 2 | 70 | 0 |
| 7694 | 5 | 45 | 45 | 5 | 0 | 1 | 45 | 0 |
| 6762 | 10 | 35 | 5 | 50 | 0 | 2 | 35 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 5 | 70 | 15 | 10 | 0 | 1 | 22 | 0 |
| 7612 | 5 | 80 | 5 | 10 | 0 | 1 | 44 | 0 |
| 6755 | 5 | 25 | 20 | 50 | 0 | 1 | 35 | 0 |
| 6755 | 20 | 20 | 30 | 5 | 25 | 2 | 63 | 0 |
| 7616(2) | 5 | 5 | 10 | 80 | 0 | 1 | 30 | 0 |
| 7616(2) | 10 | 0 | 10 | 80 | 0 | 2 | 42 | 0 |
| 6776 | 0 | 75 | 5 | 20 | 0 | 0 | 38 | 0 |
| 6776 | 5 | 45 | 10 | 10 | 30 | 1 | 66 | 0 |
| 7612(2) | 5 | 65 | 10 | 20 | 0 | 1 | 28 | 0 |
| 7612(2) | 20 | 35 | 25 | 20 | 0 | 2 | 73 | 0 |
| 5711 | 0 | 45 | 50 | 5 | 0 | 0 | 34 | 0 |
| 5711 | 0 | 75 | 0 | 25 | 0 | 0 | 41 | 0 |
| 6784 | 20 | 40 | 5 | 35 | 0 | 4 | 29 | 0 |
| 6784 | 40 | 0 | 0 | 0 | 60 | 28 | 73 | 0 |
| 6786 | 5 | 55 | 30 | 10 | 0 | 1 | 30 | 0 |
| 6786 | 5 | 10 | 5 | 80 | 0 | 1 | 30 | 0 |
| 6788 | 5 | 65 | 20 | 10 | 0 | 1 | 45 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6788 | 0 | 75 | 20 | 5 | 0 | 0 | 57 | 0 |
| 6793 | 5 | 80 | 10 | 5 | 0 | 2 | 43 | 0 |
| 6793 | 5 | 75 | 15 | 5 | 0 | 1 | 47 | 0 |
| 6413(2) | 40 | 10 | 25 | 25 | 0 | 20 | 280 | 0 |
| 6423(2) | 20 | 30 | 5 | 0 | 0 | 10 | 1360 | 45 |
| 7778(2) | 5 | 60 | 10 | 15 | 10 | 3 | 670 | 0 |
| 7778(2) | 25 | 60 | 0 | 15 | 0 | 15 | 240 | 0 |
| 6421(2) | 15 | 30 | 25 | 30 | 0 | 40 | 210 | 0 |
| 6421(2) | 15 | 15 | 25 | 0 | 545 | 5 | 760 | 0 |
| 7796(3) | 10 | 50 | 5 | 30 | 5 | 3 | 500 | 0 |
| 7796(3) | 5 | 5 | 5 | 35 | 50 | 5 | 500 | 0 |
| 7754(3) | 5 | 35 | 10 | 10 | 40 | 30 | 950 | 0 |
| 7754(3) | 35 | 50 | 0 | 15 | 0 | 10 | 280 | 0 |
| 7754(2) | 5 | 80 | 5 | 10 | 0 | 2 | 250 | 0 |
| 7754(2) | 80 | 10 | 10 | 0 | 0 | 380 | 450 | 0 |
| 6421 | 15 | 45 | 10 | 30 | 0 | 10 | 1030 | 0 |
| 6421 | 45 | 30 | 25 | 0 | 0 | 45 | 1025 | 0 |
| 6413 | 30 | 35 | 25 | 0 | 5 | 120 | 640 | 0 |
| 6413 | 5 | 15 | 20 | 15 | 45 | 5 | 1080 | 0 |
| 7777(2) | 15 | 30 | 10 | 45 | 0 | 10 | 525 | 0 |
| 7777(2) | 20 | 60 | 5 | 15 | 0 | 45 | 240 | 0 |
| 7758(2) | 30 | 20 | 15 | 5 | 30 | 45 | 580 | 0 |
| 7758(2) | 15 | 75 | 5 | 5 | 0 | 50 | 610 | 0 |
| 7758(3) | 20 | 25 | 15 | 20 | 20 | 10 | 650 | 0 |
| 7758(3) | 5 | 35 | 25 | 35 | 0 | 2 | 360 | 0 |
| 7758 | 20 | 20 | 15 | 25 | 20 | 55 | 390 | 0 |
| 7758 | 30 | 30 | 20 | 20 | 0 | 30 | 640 | 0 |
| 7778 | 10 | 40 | 20 | 30 | 0 | 25 | 185 | 0 |
| 7778 | 60 | 15 | 5 | 0 | 20 | 130 | 1004 | 0 |
| 5781 | 25 | 25 | 10 | 35 | 5 | 2 | 330 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5781 | 55 | 30 | 10 | 5 | 0 | 25 | 190 | 0 |
| 7764 | 5 | 60 | 10 | 25 | 0 | 2 | 370 | 0 |
| 7764 | 10 | 70 | 15 | 5 | 0 | 5 | 980 | 0 |
| 7786 | 20 | 25 | 20 | 15 | 20 | 10 | 410 | 0 |
| 7786 | 0 | 30 | 5 | 5 | 15 | 15 | 340 | 0 |
| 7777 | 0 | 10 | 0 | 70 | 20 | 0 | 370 | 0 |
| 7777 | 30 | 25 | 35 | 10 | 0 | 15 | 380 | 0 |
| 6531 | 5 | 50 | 0 | 45 | 0 | 10 | 140 | 0 |
| 6531 | 0 | 30 | 10 | 70 | 0 | 0 | 235 | 0 |
| 7754 | 0 | 45 | 10 | 45 | 0 | 0 | 100 | 0 |
| 7754 | 0 | 15 | 5 | 80 | 0 | 0 | 155 | 0 |
| 7796(2) | 10 | 45 | 5 | 40 | 0 | 1 | 175 | 0 |
| 7796(2) | 25 | 55 | 20 | 0 | 0 | 25 | 850 | 0 |
| 7796 | 5 | 80 | 5 | 5 | 5 | 1 | 550 | 0 |
| 7796 | 5 | 25 | 30 | 40 | 0 | 2 | 220 | 0 |

| Bird-ID | Litter % 5m E | Grass % 5m E | Forbs % 5m E | Bare % 5m E | Shrubs % 5m E | Litter Depth (cm) 5m E | Tallest Plant (cm) 5m E | Exotic 5m E |
|---|---|---|---|---|---|---|---|---|
| 6794 | 5 | 25 | 0 | 70 | 0 | 1 | 44 | 0 |
| 6794 | 0 | 20 | 35 | 45 | 0 | 0 | 40 | 0 |
| 7616 | 5 | 5 | 30 | 60 | 0 | 1 | 25 | 0 |
| 7616 | 10 | 5 | 60 | 0 | 0 | 1 | 25 | 0 |
| 7694 | 15 | 50 | 30 | 5 | 0 | 1 | 60 | 0 |
| 7694 | 5 | 25 | 65 | 5 | 0 | 1 | 28 | 0 |
| 6762 | 50 | 5 | 5 | 5 | 45 | 20 | 25 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 30 | 30 | 10 | 5 | 25 | 4 | 41 | 0 |
| 7612 | 0 | 50 | 15 | 35 | 0 | 0 | 30 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6755 | 5 | 5 | 10 | 60 | 20 | 1 | 40 | 0 |
| 6755 | 25 | 40 | 10 | 0 | 25 | 2 | 79 | 0 |
| 7616(2) | 0 | 0 | 0 | 0 | 100 | 0 | 91 | 0 |
| 7616(2) | 5 | 10 | 5 | 80 | 0 | 1 | 15 | 0 |
| 6776 | 5 | 65 | 20 | 10 | 0 | 1 | 37 | 0 |
| 6776 | 5 | 65 | 20 | 10 | 0 | 1 | 46 | 0 |
| 7612(2) | 5 | 85 | 10 | 0 | 0 | 1 | 53 | 0 |
| 7612(2) | 15 | 15 | 40 | 30 | 0 | 2 | 73 | 0 |
| 5711 | 5 | 30 | 60 | 5 | 0 | 1 | 48 | 0 |
| 5711 | 5 | 20 | 40 | 35 | 0 | 1 | 37 | 0 |
| 6784 | 10 | 10 | 10 | 70 | 0 | 1 | 20 | 0 |
| 6784 | 5 | 15 | 10 | 70 | 0 | 1 | 61 | 0 |
| 6786 | 5 | 40 | 30 | 25 | 0 | 1 | 77 | 0 |
| 6786 | 0 | 10 | 10 | 80 | 0 | 0 | 15 | 0 |
| 6788 | 10 | 55 | 35 | 0 | 0 | 2 | 57 | 0 |
| 6788 | 0 | 85 | 5 | 10 | 0 | 0 | 62 | 0 |
| 6793 | 5 | 40 | 5 | 50 | 0 | 1 | 14 | 0 |
| 6793 | 10 | 60 | 30 | 0 | 0 | 1 | 36 | 0 |
| 6413(2) | 25 | 20 | 35 | 20 | 0 | 20 | 515 | 0 |
| 6423(2) | 30 | 60 | 0 | 10 | 0 | 10 | 470 | 0 |
| 7778(2) | 10 | 30 | 15 | 25 | 20 | 40 | 585 | 0 |
| 7778(2) | 20 | 20 | 0 | 60 | 0 | 2 | 175 | 0 |
| 6421(2) | 10 | 30 | 15 | 45 | 0 | 3 | 785 | 0 |
| 6421(2) | 10 | 45 | 15 | 5 | 25 | 25 | 900 | 0 |
| 7796(3) | 20 | 65 | 5 | 10 | 0 | 2 | 390 | 0 |
| 7796(3) | 10 | 60 | 0 | 10 | 20 | 5 | 545 | 0 |
| 7754(3) | 5 | 45 | 15 | 35 | 0 | 5 | 605 | 0 |
| 7754(3) | 5 | 65 | 0 | 30 | 0 | 2 | 110 | 0 |
| 7754(2) | 10 | 65 | 20 | 5 | 0 | 5 | 330 | 0 |
| 7754(2) | 60 | 10 | 10 | 20 | 0 | 210 | 940 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6421 | 30 | 40 | 20 | 10 | 0 | 25 | 540 | 0 |
| 6421 | 10 | 15 | 25 | 50 | 0 | 20 | 810 | 0 |
| 6413 | 20 | 25 | 10 | 40 | 5 | 35 | 265 | 0 |
| 6413 | 25 | 30 | 20 | 15 | 10 | 25 | 310 | 0 |
| 7777(2) | 50 | 10 | 15 | 25 | 0 | 50 | 435 | 0 |
| 7777(2) | 50 | 45 | 0 | 5 | 0 | 30 | 240 | 0 |
| 7758(2) | 15 | 50 | 5 | 30 | 0 | 5 | 370 | 0 |
| 7758(2) | 25 | 10 | 15 | 40 | 10 | 25 | 975 | 0 |
| 7758(3) | 10 | 40 | 10 | 40 | 0 | 20 | 620 | 0 |
| 7758(3) | 5 | 55 | 10 | 30 | 0 | 10 | 400 | 0 |
| 7758 | 10 | 50 | 5 | 20 | 15 | 10 | 545 | 0 |
| 7758 | 25 | 15 | 20 | 20 | 20 | 30 | 840 | 0 |
| 7778 | 50 | 20 | 5 | 65 | 0 | 65 | 570 | 0 |
| 7778 | 30 | 25 | 5 | 40 | 0 | 2 | 80 | 0 |
| 5781 | 15 | 50 | 10 | 15 | 10 | 2 | 560 | 0 |
| 5781 | 35 | 30 | 25 | 10 | 0 | 5 | 120 | 0 |
| 7764 | 5 | 30 | 15 | 50 | 0 | 1 | 160 | 0 |
| 7764 | 20 | 30 | 30 | 20 | 0 | 45 | 795 | 0 |
| 7786 | 20 | 50 | 10 | 20 | 0 | 10 | 350 | 0 |
| 7786 | 50 | 10 | 15 | 25 | 0 | 10 | 350 | 0 |
| 7777 | 75 | 10 | 10 | 5 | 0 | 15 | 490 | 0 |
| 7777 | 55 | 30 | 15 | 0 | 0 | 20 | 365 | 0 |
| 6531 | 5 | 25 | 10 | 60 | 0 | 10 | 440 | 0 |
| 6531 | 0 | 40 | 5 | 50 | 0 | 0 | 320 | 0 |
| 7754 | 0 | 10 | 5 | 85 | 0 | 0 | 580 | 0 |
| 7754 | 0 | 5 | 5 | 90 | 0 | 0 | 760 | 0 |
| 7796(2) | 5 | 65 | 10 | 5 | 15 | 10 | 310 | 0 |
| 7796(2) | 35 | 0 | 15 | 30 | 20 | 35 | 900 | 0 |
| 7796 | 20 | 45 | 15 | 20 | 0 | 1 | 450 | 0 |
| 7796 | 0 | 25 | 10 | 60 | 5 | 0 | 535 | 0 |

| Bird-ID | Litter % 5m S | Grass % 5m S | Forbs % 5m S | Bare % 5m S | Shrubs % 5m S | Litter Depth (cm) 5m S | Tallest Plant (cm) 5m S | Exotic 5m S |
|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 5 | 40 | 55 | 0 | 0 | 39 | 0 |
| 6794 | 5 | 30 | 15 | 50 | 0 | 1 | 59 | 0 |
| 7616 | 30 | 0 | 0 | 0 | 70 | 4 | 58 | 0 |
| 7616 | 10 | 45 | 15 | 30 | 0 | 1 | 23 | 0 |
| 7694 | 10 | 5 | 0 | 0 | 85 | 2 | 59 | 0 |
| 7694 | 0 | 20 | 65 | 15 | 0 | 0 | 33 | 0 |
| 6762 | 90 | 5 | 5 | 0 | 0 | 4 | 20 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 5 | 70 | 5 | 20 | 0 | 1 | 26 | 0 |
| 7612 | 10 | 80 | 5 | 5 | 0 | 2 | 34 | 0 |
| 6755 | 10 | 40 | 10 | 40 | 0 | 1 | 44 | 0 |
| 6755 | 5 | 0 | 0 | 0 | 95 | 1 | 68 | 0 |
| 7616(2) | 0 | 0 | 0 | 0 | 100 | 0 | 116 | 0 |
| 7616(2) | 0 | 0 | 40 | 60 | 0 | 0 | 41 | 0 |
| 6776 | 10 | 15 | 25 | 50 | 0 | 1 | 55 | 0 |
| 6776 | 5 | 75 | 15 | 5 | 0 | 1 | 58 | 0 |
| 7612(2) | 15 | 75 | 10 | 0 | 0 | 2 | 41 | 0 |
| 7612(2) | 5 | 5 | 45 | 45 | 0 | 1 | 53 | 0 |
| 5711 | 0 | 65 | 25 | 10 | 0 | 0 | 116 | 0 |
| 5711 | 10 | 20 | 70 | 0 | 0 | 3 | 57 | 0 |
| 6784 | 10 | 0 | 5 | 85 | 0 | 1 | 4 | 0 |
| 6784 | 5 | 5 | 0 | 90 | 0 | 1 | 11 | 0 |
| 6786 | 5 | 15 | 5 | 75 | 0 | 1 | 7 | 0 |
| 6786 | 0 | 15 | 15 | 70 | 0 | 0 | 16 | 0 |
| 6788 | 10 | 60 | 25 | 5 | 0 | 1 | 48 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6788 | 5 | 50 | 20 | 25 | 0 | 1 | 60 | 0 |
| 6793 | 5 | 55 | 20 | 20 | 0 | 1 | 61 | 0 |
| 6793 | 5 | 55 | 10 | 0 | 30 | 1 | 56 | 0 |
| 6413(2) | 10 | 35 | 15 | 40 | 0 | 15 | 510 | 0 |
| 6423(2) | 20 | 55 | 25 | 0 | 0 | 80 | 550 | 0 |
| 7778(2) | 80 | 10 | 5 | 5 | 0 | 20 | 505 | 0 |
| 7778(2) | 20 | 55 | 0 | 25 | 0 | 7 | 456 | 0 |
| 6421(2) | 5 | 80 | 10 | 5 | 0 | 1 | 1550 | 0 |
| 6421(2) | 45 | 15 | 10 | 0 | 40 | 50 | 550 | 0 |
| 7796(3) | 10 | 60 | 5 | 20 | 5 | 2 | 420 | 0 |
| 7796(3) | 5 | 30 | 0 | 65 | 0 | 15 | 460 | 0 |
| 7754(3) | 20 | 60 | 15 | 5 | 0 | 20 | 320 | 0 |
| 7754(3) | 5 | 65 | 0 | 30 | 0 | 2 | 150 | 0 |
| 7754(2) | 40 | 20 | 30 | 10 | 0 | 20 | 290 | 0 |
| 7754(2) | 35 | 35 | 10 | 0 | 20 | 40 | 1300 | 0 |
| 6421 | 5 | 15 | 25 | 5 | 50 | 30 | 855 | 0 |
| 6421 | 50 | 35 | 15 | 0 | 0 | 45 | 1010 | 0 |
| 6413 | 25 | 30 | 25 | 15 | 5 | 30 | 350 | 0 |
| 6413 | 5 | 5 | 25 | 5 | 60 | 45 | 625 | 0 |
| 7777(2) | 75 | 0 | 5 | 0 | 0 | 190 | 455 | 20 |
| 7777(2) | 75 | 20 | 5 | 0 | 0 | 250 | 540 | 0 |
| 7758(2) | 10 | 60 | 15 | 15 | 0 | 15 | 650 | 0 |
| 7758(2) | 25 | 20 | 50 | 5 | 0 | 45 | 730 | 0 |
| 7758(3) | 10 | 45 | 10 | 35 | 0 | 20 | 490 | 0 |
| 7758(3) | 10 | 50 | 20 | 20 | 0 | 30 | 600 | 0 |
| 7758 | 20 | 35 | 10 | 25 | 10 | 60 | 950 | 0 |
| 7758 | 20 | 25 | 10 | 25 | 20 | 30 | 560 | 0 |
| 7778 | 40 | 30 | 20 | 10 | 0 | 2 | 105 | 0 |
| 7778 | 20 | 60 | 20 | 0 | 0 | 50 | 675 | 0 |
| 5781 | 20 | 30 | 10 | 40 | 0 | 2 | 420 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 5781 | 20 | 50 | 0 | 5 | 25 | 40 | 602 | 0 |
| 7764 | 10 | 75 | 5 | 10 | 0 | 10 | 580 | 0 |
| 7764 | 5 | 20 | 65 | 10 | 0 | 2 | 740 | 0 |
| 7786 | 20 | 20 | 10 | 30 | 20 | 20 | 400 | 0 |
| 7786 | 55 | 10 | 25 | 10 | 0 | 5 | 540 | 0 |
| 7777 | 40 | 20 | 10 | 5 | 15 | 20 | 470 | 0 |
| 7777 | 15 | 15 | 20 | 50 | 0 | 10 | 410 | 0 |
| 6531 | 0 | 30 | 10 | 40 | 20 | 0 | 500 | 0 |
| 6531 | 0 | 50 | 5 | 45 | 0 | 0 | 600 | 0 |
| 7754 | 0 | 60 | 5 | 5 | 30 | 0 | 730 | 0 |
| 7754 | 0 | 10 | 5 | 85 | 0 | 0 | 440 | 0 |
| 7796(2) | 20 | 60 | 5 | 5 | 10 | 2 | 360 | 0 |
| 7796(2) | 5 | 70 | 20 | 5 | 0 | 1 | 640 | 0 |
| 7796 | 15 | 70 | 5 | 10 | 0 | 1 | 372 | 0 |
| 7796 | 5 | 60 | 15 | 20 | 0 | 5 | 460 | 0 |

| Bird-ID | Litter % 5m W | Grass % 5m W | Forbs % 5m W | Bare % 5m W | Shrubs % 5m W | Litter Depth (cm) 5m W | Tallest Plant (cm) 5m W | Exotic 5m W |
|---|---|---|---|---|---|---|---|---|
| 6794 | 5 | 20 | 25 | 50 | 0 | 1 | 28 | 0 |
| 6794 | 0 | 10 | 35 | 55 | 0 | 0 | 25 | 0 |
| 7616 | 5 | 25 | 20 | 50 | 0 | 1 | 33 | 0 |
| 7616 | 20 | 65 | 10 | 5 | 0 | 2 | 28 | 0 |
| 7694 | 10 | 60 | 30 | 0 | 0 | 2 | 47 | 0 |
| 7694 | 0 | 15 | 65 | 10 | 10 | 0 | 33 | 0 |
| 6762 | 45 | 20 | 30 | 0 | 5 | 2 | 30 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 20 | 70 | 5 | 5 | 0 | 2 | 32 | 0 |
| 7612 | 15 | 50 | 5 | 30 | 0 | 1 | 34 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 6755 | 10 | 40 | 10 | 40 | 0 | 1 | 53 | 0 |
| 6755 | 10 | 5 | 25 | 60 | 0 | 1 | 27 | 0 |
| 7616(2) | 10 | 0 | 20 | 65 | 15 | 1 | 64 | 0 |
| 7616(2) | 0 | 5 | 0 | 95 | 0 | 0 | 47 | 0 |
| 6776 | 0 | 90 | 0 | 5 | 5 | 0 | 33 | 0 |
| 6776 | 10 | 35 | 15 | 25 | 15 | 1 | 44 | 0 |
| 7612(2) | 5 | 70 | 10 | 15 | 0 | 1 | 15 | 0 |
| 7612(2) | 5 | 25 | 15 | 5 | 0 | 1 | 28 | 0 |
| 5711 | 0 | 50 | 30 | 20 | 0 | 1 | 32 | 0 |
| 5711 | 10 | 0 | 50 | 40 | 0 | 1 | 83 | 0 |
| 6784 | 5 | 5 | 20 | 70 | 0 | 1 | 18 | 0 |
| 6784 | 10 | 15 | 5 | 70 | 0 | 3 | 61 | 0 |
| 6786 | 0 | 70 | 20 | 0 | 10 | 0 | 92 | 0 |
| 6786 | 0 | 10 | 5 | 85 | 0 | 0 | 8 | 0 |
| 6788 | 10 | 70 | 20 | 0 | 0 | 1 | 60 | 0 |
| 6788 | 10 | 20 | 60 | 0 | 10 | 3 | 65 | 0 |
| 6793 | 5 | 30 | 0 | 0 | 65 | 1 | 59 | 0 |
| 6793 | 25 | 40 | 30 | 5 | 0 | 1 | 78 | 0 |
| 6413(2) | 20 | 25 | 40 | 15 | 0 | 20 | 390 | 0 |
| 6423(2) | 15 | 35 | 15 | 30 | 5 | 60 | 450 | 0 |
| 7778(2) | 5 | 85 | 10 | 0 | 0 | 2 | 590 | 0 |
| 7778(2) | 30 | 55 | 10 | 15 | 0 | 25 | 535 | 0 |
| 6421(2) | 10 | 40 | 15 | 35 | 0 | 50 | 260 | 0 |
| 6421(2) | 10 | 55 | 15 | 20 | 0 | 10 | 635 | 0 |
| 7796(3) | 10 | 40 | 5 | 45 | 0 | 2 | 515 | 0 |
| 7796(3) | 15 | 25 | 0 | 50 | 10 | 40 | 340 | 0 |
| 7754(3) | 5 | 40 | 0 | 55 | 0 | 2 | 125 | 0 |
| 7754(3) | 5 | 75 | 10 | 10 | 0 | 2 | 360 | 0 |
| 7754(2) | 10 | 45 | 5 | 40 | 0 | 5 | 215 | 0 |
| 7754(2) | 5 | 85 | 10 | 0 | 0 | 5 | 1400 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6421 | 20 | 55 | 10 | 15 | 0 | 20 | 770 | 0 |
| 6421 | 25 | 25 | 15 | 10 | 25 | 65 | 710 | 0 |
| 6413 | 20 | 55 | 20 | 5 | 0 | 65 | 180 | 0 |
| 6413 | 15 | 15 | 0 | 5 | 65 | 70 | 410 | 0 |
| 7777(2) | 30 | 50 | 5 | 15 | 0 | 90 | 462 | 0 |
| 7777(2) | 45 | 30 | 10 | 5 | 0 | 50 | 350 | 10 |
| 7758(2) | 50 | 15 | 15 | 20 | 0 | 30 | 1080 | 0 |
| 7758(2) | 30 | 20 | 5 | 10 | 35 | 5 | 430 | 0 |
| 7758(3) | 10 | 25 | 15 | 50 | 0 | 15 | 600 | 0 |
| 7758(3) | 10 | 55 | 15 | 20 | 0 | 15 | 510 | 0 |
| 7758 | 15 | 20 | 10 | 50 | 5 | 30 | 580 | 0 |
| 7758 | 20 | 45 | 5 | 30 | 0 | 55 | 350 | 0 |
| 7778 | 35 | 40 | 20 | 5 | 0 | 35 | 195 | 0 |
| 7778 | 15 | 40 | 15 | 15 | 25 | 15 | 165 | 0 |
| 5781 | 0 | 20 | 5 | 0 | 75 | 0 | 1170 | 0 |
| 5781 | 25 | 30 | 0 | 45 | 0 | 5 | 70 | 0 |
| 7764 | 15 | 70 | 5 | 10 | 0 | 2 | 120 | 0 |
| 7764 | 30 | 25 | 45 | 0 | 0 | 20 | 1150 | 0 |
| 7786 | 10 | 15 | 40 | 30 | 5 | 10 | 580 | 0 |
| 7786 | 15 | 45 | 25 | 15 | 0 | 10 | 170 | 0 |
| 7777 | 0 | 15 | 80 | 5 | 0 | 0 | 580 | 0 |
| 7777 | 30 | 10 | 50 | 10 | 0 | 20 | 450 | 0 |
| 6531 | 5 | 75 | 5 | 5 | 10 | 10 | 380 | 0 |
| 6531 | 0 | 70 | 10 | 20 | 0 | 10 | 370 | 0 |
| 7754 | 0 | 40 | 25 | 30 | 5 | 0 | 670 | 0 |
| 7754 | 0 | 5 | 5 | 90 | 0 | 0 | 70 | 0 |
| 7796(2) | 15 | 55 | 0 | 0 | 0 | 10 | 390 | 0 |
| 7796(2) | 15 | 55 | 25 | 5 | 0 | 1 | 700 | 0 |
| 7796 | 10 | 40 | 5 | 45 | 0 | 1 | 480 | 0 |
| 7796 | 30 | 10 | 10 | 50 | 0 | 5 | 180 | 0 |

| Bird-ID | Litter % 10m N | Grass % 10m N | Forbs % 10m N | Bare % 10m N | Shrubs % 10m N | Litter Depth (cm) 10m N | Tallest Plant (cm) 10m N | Exotic 10m N |
|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 20 | 20 | 60 | 0 | 0 | 17 | 0 |
| 6794 | 5 | 40 | 20 | 35 | 0 | 1 | 88 | 0 |
| 7616 | 50 | 20 | 20 | 0 | 10 | 3 | 27 | 0 |
| 7616 | 5 | 25 | 20 | 50 | 0 | 1 | 25 | 0 |
| 7694 | 10 | 30 | 40 | 20 | 0 | 1 | 45 | 0 |
| 7694 | 5 | 35 | 50 | 10 | 0 | 1 | 28 | 0 |
| 6762 | 45 | 40 | 10 | 5 | 0 | 2 | 35 | 0 |
| 6762 | 0 | 0 | 0 | 95 | 5 | 0 | 7 | 0 |
| 7612 | 5 | 25 | 35 | 35 | 0 | 1 | 35 | 0 |
| 7612 | 5 | 50 | 10 | 35 | 0 | 1 | 29 | 0 |
| 6755 | 5 | 25 | 10 | 60 | 0 | 1 | 11 | 0 |
| 6755 | 5 | 10 | 5 | 80 | 0 | 1 | 52 | 0 |
| 7616(2) | 5 | 5 | 20 | 65 | 5 | 1 | 41 | 0 |
| 7616(2) | 15 | 0 | 25 | 60 | 0 | 1 | 22 | 0 |
| 6776 | 20 | 10 | 20 | 0 | 50 | 2 | 47 | 0 |
| 6776 | 5 | 40 | 10 | 45 | 0 | 1 | 33 | 0 |
| 7612(2) | 5 | 70 | 10 | 15 | 0 | 1 | 59 | 0 |
| 7612(2) | 5 | 15 | 20 | 60 | 0 | 1 | 31 | 0 |
| 5711 | 10 | 25 | 40 | 0 | 25 | 3 | 50 | 0 |
| 5711 | 10 | 0 | 70 | 20 | 0 | 1 | 58 | 0 |
| 6784 | 5 | 5 | 15 | 75 | 0 | 1 | 22 | 0 |
| 6784 | 10 | 15 | 15 | 60 | 0 | 2 | 15 | 0 |
| 6786 | 5 | 55 | 25 | 15 | 0 | 1 | 14 | 0 |
| 6786 | 0 | 70 | 30 | 0 | 0 | 0 | 74 | 0 |
| 6788 | 5 | 75 | 10 | 10 | 0 | 2 | 38 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6788 | 5 | 35 | 0 | 35 | 25 | 1 | 59 | 0 |
| 6793 | 5 | 40 | 35 | 20 | 0 | 1 | 56 | 0 |
| 6793 | 10 | 45 | 40 | 5 | 0 | 4 | 63 | 0 |
| 6413(2) | 40 | 25 | 15 | 20 | 0 | 25 | 575 | 0 |
| 6423(2) | 15 | 60 | 0 | 25 | 0 | 20 | 650 | 0 |
| 7778(2) | 20 | 75 | 0 | 5 | 0 | 20 | 440 | 0 |
| 7778(2) | 15 | 50 | 5 | 30 | 0 | 10 | 230 | 0 |
| 6421(2) | 20 | 20 | 15 | 45 | 0 | 3 | 480 | 0 |
| 6421(2) | 20 | 30 | 35 | 5 | 10 | 80 | 860 | 0 |
| 7796(3) | 10 | 60 | 0 | 30 | 0 | 3 | 845 | 0 |
| 7796(3) | 5 | 20 | 10 | 65 | 0 | 5 | 460 | 0 |
| 7754(3) | 5 | 55 | 25 | 15 | 0 | 10 | 250 | 0 |
| 7754(3) | 20 | 25 | 0 | 55 | 0 | 5 | 210 | 0 |
| 7754(2) | 15 | 60 | 10 | 5 | 10 | 3 | 1160 | 0 |
| 7754(2) | 45 | 45 | 10 | 0 | 0 | 15 | 1450 | 0 |
| 6421 | 35 | 35 | 20 | 10 | 0 | 75 | 710 | 0 |
| 6421 | 60 | 35 | 5 | 0 | 0 | 90 | 915 | 0 |
| 6413 | 40 | 30 | 25 | 5 | 0 | 90 | 790 | 0 |
| 6413 | 20 | 15 | 35 | 20 | 10 | 15 | 305 | 0 |
| 7777(2) | 15 | 20 | 10 | 35 | 0 | 35 | 585 | 20 |
| 7777(2) | 70 | 20 | 5 | 5 | 0 | 120 | 220 | 0 |
| 7758(2) | 25 | 20 | 20 | 35 | 0 | 30 | 650 | 0 |
| 7758(2) | 20 | 55 | 10 | 15 | 0 | 65 | 770 | 0 |
| 7758(3) | 45 | 20 | 10 | 5 | 20 | 140 | 510 | 0 |
| 7758(3) | 20 | 55 | 10 | 5 | 10 | 20 | 715 | 0 |
| 7758 | 5 | 15 | 10 | 25 | 45 | 2 | 525 | 0 |
| 7758 | 5 | 15 | 30 | 50 | 0 | 25 | 610 | 0 |
| 7778 | 20 | 55 | 20 | 5 | 0 | 20 | 305 | 0 |
| 7778 | 15 | 40 | 10 | 35 | 0 | 20 | 407 | 0 |
| 5781 | 20 | 25 | 10 | 25 | 20 | 30 | 520 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5781 | 40 | 25 | 5 | 30 | 0 | 10 | 65 | 0 |
| 7764 | 70 | 15 | 5 | 10 | 0 | 155 | 600 | 0 |
| 7764 | 65 | 15 | 15 | 0 | 0 | 30 | 754 | 5 |
| 7786 | 25 | 5 | 25 | 45 | 0 | 5 | 170 | 0 |
| 7786 | 20 | 45 | 10 | 25 | 0 | 5 | 590 | 0 |
| 7777 | 0 | 95 | 5 | 0 | 0 | 10 | 860 | 0 |
| 7777 | 5 | 10 | 85 | 0 | 0 | 20 | 960 | 0 |
| 6531 | 5 | 55 | 10 | 30 | 0 | 10 | 450 | 0 |
| 6531 | 0 | 30 | 10 | 60 | 0 | 0 | 260 | 0 |
| 7754 | 0 | 25 | 5 | 70 | 0 | 0 | 220 | 0 |
| 7754 | 0 | 25 | 5 | 70 | 0 | 0 | 540 | 0 |
| 7796(2) | 5 | 55 | 5 | 35 | 0 | 1 | 260 | 0 |
| 7796(2) | 20 | 15 | 15 | 50 | 0 | 2 | 300 | 0 |
| 7796 | 10 | 55 | 10 | 25 | 0 | 2 | 500 | 0 |
| 7796 | 5 | 60 | 10 | 25 | 0 | 2 | 175 | 0 |

| **Bird-ID** | **Litter % 10m E** | **Grass % 10m E** | **Forbs % 10m E** | **Bare % 10m E** | **Shrubs % 10m E** | **Litter Depth (cm) 10m E** | **Tallest Plant (cm) 10m E** | **Exotic 10m E** |
|---|---|---|---|---|---|---|---|---|
| 6794 | 20 | 65 | 5 | 0 | 10 | 1 | 57 | 0 |
| 6794 | 5 | 25 | 35 | 35 | 0 | 1 | 33 | 0 |
| 7616 | 5 | 15 | 70 | 10 | 0 | 2 | 42 | 0 |
| 7616 | 0 | 55 | 20 | 35 | 0 | 0 | 19 | 0 |
| 7694 | 10 | 35 | 45 | 10 | 0 | 2 | 60 | 0 |
| 7694 | 5 | 20 | 75 | 0 | 0 | 1 | 44 | 0 |
| 6762 | 20 | 30 | 10 | 40 | 0 | 2 | 35 | 0 |
| 6762 | 0 | 0 | 5 | 95 | 0 | 0 | 2 | 0 |
| 7612 | 10 | 60 | 10 | 20 | 0 | 1 | 31 | 0 |
| 7612 | 20 | 65 | 10 | 5 | 0 | 1 | 35 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6755 | 10 | 40 | 20 | 30 | 0 | 1 | 85 | 0 |
| 6755 | 20 | 30 | 20 | 10 | 20 | 2 | 86 | 0 |
| 7616(2) | 10 | 20 | 25 | 45 | 0 | 1 | 36 | 0 |
| 7616(2) | 10 | 15 | 0 | 65 | 0 | 2 | 39 | 0 |
| 6776 | 0 | 30 | 25 | 45 | 0 | 0 | 46 | 0 |
| 6776 | 0 | 40 | 0 | 60 | 0 | 0 | 38 | 0 |
| 7612(2) | 5 | 45 | 30 | 20 | 0 | 1 | 55 | 0 |
| 7612(2) | 30 | 60 | 10 | 0 | 0 | 3 | 84 | 0 |
| 5711 | 5 | 50 | 45 | 10 | 0 | 1 | 34 | 0 |
| 5711 | 5 | 0 | 0 | 95 | 0 | 1 | 0 | 0 |
| 6784 | 5 | 5 | 10 | 80 | 0 | 1 | 26 | 0 |
| 6784 | 0 | 10 | 25 | 65 | 0 | 0 | 67 | 0 |
| 6786 | 0 | 45 | 5 | 50 | 0 | 0 | 12 | 0 |
| 6786 | 0 | 90 | 5 | 0 | 5 | 0 | 34 | 0 |
| 6788 | 5 | 85 | 10 | 0 | 0 | 1 | 68 | 0 |
| 6788 | 5 | 70 | 10 | 15 | 0 | 1 | 68 | 0 |
| 6793 | 10 | 55 | 30 | 5 | 0 | 1 | 64 | 0 |
| 6793 | 5 | 70 | 5 | 15 | 5 | 1 | 52 | 0 |
| 6413(2) | 30 | 60 | 0 | 10 | 0 | 20 | 590 | 0 |
| 6423(2) | 10 | 85 | 0 | 5 | 0 | 5 | 600 | 0 |
| 7778(2) | 10 | 30 | 5 | 15 | 40 | 5 | 705 | 0 |
| 7778(2) | 15 | 25 | 0 | 60 | 0 | 2 | 175 | 0 |
| 6421(2) | 20 | 20 | 40 | 20 | 0 | 120 | 435 | 0 |
| 6421(2) | 50 | 20 | 30 | 0 | 0 | 100 | 990 | 0 |
| 7796(3) | 0 | 35 | 0 | 0 | 60 | 0 | 905 | 0 |
| 7796(3) | 5 | 40 | 15 | 40 | 0 | 15 | 645 | 0 |
| 7754(3) | 5 | 70 | 15 | 10 | 0 | 2 | 593 | 0 |
| 7754(3) | 15 | 60 | 0 | 25 | 0 | 2 | 210 | 0 |
| 7754(2) | 30 | 40 | 25 | 5 | 0 | 4 | 1110 | 0 |
| 7754(2) | 15 | 15 | 0 | 70 | 0 | 2 | 85 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6421 | 60 | 20 | 5 | 15 | 0 | 60 | 170 | 0 |
| 6421 | 25 | 15 | 20 | 40 | 0 | 10 | 715 | 0 |
| 6413 | 35 | 35 | 30 | 0 | 0 | 45 | 640 | 0 |
| 6413 | 10 | 30 | 15 | 10 | 35 | 35 | 380 | 0 |
| 7777(2) | 25 | 45 | 10 | 15 | 5 | 45 | 420 | 0 |
| 7777(2) | 45 | 35 | 5 | 15 | 0 | 10 | 340 | 0 |
| 7758(2) | 15 | 30 | 40 | 10 | 5 | 20 | 550 | 0 |
| 7758(2) | 10 | 60 | 15 | 15 | 0 | 5 | 1100 | 0 |
| 7758(3) | 15 | 15 | 25 | 35 | 10 | 10 | 630 | 0 |
| 7758(3) | 10 | 25 | 10 | 5 | 50 | 10 | 600 | 0 |
| 7758 | 25 | 20 | 10 | 0 | 45 | 30 | 918 | 0 |
| 7758 | 5 | 30 | 10 | 55 | 0 | 15 | 335 | 0 |
| 7778 | 30 | 50 | 15 | 5 | 0 | 50 | 601 | 0 |
| 7778 | 45 | 35 | 10 | 10 | 0 | 15 | 280 | 0 |
| 5781 | 35 | 10 | 10 | 5 | 40 | 30 | 700 | 0 |
| 5781 | 30 | 60 | 10 | 0 | 0 | 10 | 100 | 0 |
| 7764 | 30 | 25 | 15 | 30 | 0 | 2 | 130 | 0 |
| 7764 | 30 | 10 | 40 | 20 | 0 | 30 | 810 | 0 |
| 7786 | 85 | 5 | 10 | 0 | 0 | 30 | 400 | 0 |
| 7786 | 20 | 0 | 20 | 20 | 40 | 10 | 550 | 0 |
| 7777 | 45 | 20 | 15 | 20 | 0 | 5 | 480 | 0 |
| 7777 | 15 | 45 | 15 | 25 | 0 | 15 | 740 | 0 |
| 6531 | 0 | 10 | 10 | 70 | 10 | 0 | 210 | 0 |
| 6531 | 5 | 80 | 5 | 5 | 5 | 10 | 550 | 0 |
| 7754 | 0 | 30 | 10 | 60 | 0 | 0 | 390 | 0 |
| 7754 | 0 | 5 | 5 | 90 | 0 | 0 | 550 | 0 |
| 7796(2) | 20 | 40 | 5 | 35 | 0 | 2 | 390 | 0 |
| 7796(2) | 30 | 45 | 25 | 0 | 0 | 10 | 460 | 0 |
| 7796 | 20 | 65 | 5 | 10 | 0 | 2 | 510 | 0 |
| 7796 | 20 | 30 | 15 | 25 | 10 | 15 | 520 | 0 |

| Bird-ID | Litter % 10m S | Grass % 10m S | Forbs % 10m S | Bare % 10m S | Shrubs % 10m S | Litter Depth (cm) 10m S | Tallest Plant (cm) 10m S | Exotic 10m S |
|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 40 | 10 | 50 | 0 | 0 | 22 | 0 |
| 6794 | 0 | 10 | 10 | 80 | 0 | 0 | 29 | 0 |
| 7616 | 30 | 40 | 0 | 30 | 0 | 1 | 24 | 0 |
| 7616 | 5 | 30 | 30 | 35 | 0 | 1 | 35 | 0 |
| 7694 | 10 | 5 | 45 | 0 | 40 | 1 | 45 | 0 |
| 7694 | 0 | 15 | 45 | 40 | 0 | 0 | 27 | 0 |
| 6762 | 0 | 5 | 35 | 60 | 0 | 0 | 36 | 0 |
| 6762 | 0 | 0 | 0 | 95 | 5 | 0 | 7 | 0 |
| 7612 | 5 | 20 | 45 | 15 | 25 | 1 | 39 | 0 |
| 7612 | 5 | 10 | 40 | 40 | 5 | 1 | 25 | 0 |
| 6755 | 20 | 40 | 0 | 35 | 5 | 2 | 48 | 0 |
| 6755 | 5 | 0 | 20 | 0 | 75 | 2 | 60 | 0 |
| 7616(2) | 5 | 15 | 15 | 65 | 0 | 1 | 30 | 0 |
| 7616(2) | 0 | 5 | 0 | 95 | 0 | 0 | 47 | 0 |
| 6776 | 5 | 50 | 0 | 45 | 0 | 1 | 43 | 0 |
| 6776 | 5 | 75 | 0 | 20 | 0 | 1 | 35 | 0 |
| 7612(2) | 0 | 40 | 35 | 25 | 0 | 0 | 15 | 0 |
| 7612(2) | 15 | 30 | 15 | 40 | 0 | 1 | 63 | 0 |
| 5711 | 0 | 50 | 0 | 50 | 0 | 0 | 26 | 0 |
| 5711 | 10 | 10 | 80 | 0 | 0 | 1 | 100 | 0 |
| 6784 | 0 | 10 | 5 | 85 | 0 | 0 | 17 | 0 |
| 6784 | 5 | 0 | 75 | 20 | 0 | 1 | 80 | 0 |
| 6786 | 0 | 35 | 65 | 0 | 0 | 0 | 48 | 0 |
| 6786 | 5 | 65 | 30 | 0 | 0 | 1 | 73 | 0 |
| 6788 | 5 | 65 | 25 | 5 | 0 | 1 | 42 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6788 | 5 | 70 | 5 | 15 | 5 | 1 | 51 | 0 |
| 6793 | 5 | 50 | 25 | 20 | 0 | 1 | 39 | 0 |
| 6793 | 10 | 40 | 20 | 30 | 0 | 1 | 56 | 0 |
| 6413(2) | 10 | 50 | 15 | 25 | 0 | 20 | 480 | 0 |
| 6423(2) | 20 | 55 | 10 | 10 | 5 | 15 | 470 | 0 |
| 7778(2) | 5 | 40 | 25 | 30 | 0 | 1 | 525 | 0 |
| 7778(2) | 25 | 50 | 15 | 10 | 0 | 10 | 570 | 0 |
| 6421(2) | 5 | 75 | 5 | 15 | 0 | 1 | 760 | 0 |
| 6421(2) | 20 | 60 | 15 | 5 | 0 | 30 | 420 | 0 |
| 7796(3) | 10 | 30 | 20 | 40 | 0 | 10 | 665 | 0 |
| 7796(3) | 5 | 30 | 10 | 50 | 5 | 10 | 300 | 0 |
| 7754(3) | 10 | 60 | 10 | 15 | 5 | 30 | 560 | 0 |
| 7754(3) | 5 | 80 | 10 | 5 | 0 | 5 | 390 | 0 |
| 7754(2) | 10 | 85 | 5 | 0 | 0 | 10 | 570 | 0 |
| 7754(2) | 55 | 0 | 5 | 0 | 40 | 200 | 1000 | 0 |
| 6421 | 25 | 25 | 20 | 20 | 10 | 60 | 680 | 0 |
| 6421 | 15 | 55 | 20 | 10 | 0 | 30 | 1360 | 0 |
| 6413 | 25 | 35 | 25 | 15 | 5 | 30 | 350 | 0 |
| 6413 | 30 | 20 | 15 | 10 | 25 | 25 | 500 | 0 |
| 7777(2) | 50 | 15 | 15 | 20 | 0 | 25 | 260 | 0 |
| 7777(2) | 65 | 15 | 0 | 20 | 0 | 50 | 125 | 0 |
| 7758(2) | 45 | 20 | 15 | 10 | 10 | 15 | 650 | 0 |
| 7758(2) | 30 | 30 | 25 | 15 | 0 | 25 | 350 | 0 |
| 7758(3) | 20 | 45 | 0 | 35 | 0 | 50 | 630 | 0 |
| 7758(3) | 5 | 35 | 25 | 10 | 25 | 2 | 810 | 0 |
| 7758 | 15 | 30 | 15 | 40 | 0 | 15 | 250 | 0 |
| 7758 | 15 | 45 | 15 | 25 | 0 | 5 | 580 | 0 |
| 7778 | 45 | 30 | 10 | 5 | 10 | 35 | 180 | 0 |
| 7778 | 30 | 25 | 10 | 35 | 0 | 5 | 110 | 0 |
| 5781 | 10 | 60 | 5 | 25 | 0 | 1 | 700 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5781 | 55 | 20 | 15 | 10 | 0 | 25 | 270 | 0 |
| 7764 | 5 | 70 | 10 | 15 | 0 | 2 | 550 | 0 |
| 7764 | 10 | 65 | 20 | 0 | 0 | 75 | 862 | 5 |
| 7786 | 0 | 70 | 5 | 10 | 15 | 0 | 580 | 0 |
| 7786 | 30 | 40 | 10 | 20 | 0 | 10 | 500 | 0 |
| 7777 | 20 | 5 | 25 | 50 | 0 | 10 | 620 | 0 |
| 7777 | 25 | 50 | 15 | 0 | 10 | 10 | 601 | 0 |
| 6531 | 5 | 80 | 10 | 5 | 0 | 10 | 400 | 0 |
| 6531 | 5 | 80 | 10 | 5 | 0 | 20 | 700 | 0 |
| 7754 | 0 | 60 | 5 | 35 | 0 | 0 | 660 | 0 |
| 7754 | 0 | 15 | 5 | 80 | 0 | 0 | 442 | 0 |
| 7796(2) | 5 | 40 | 5 | 40 | 10 | 20 | 180 | 0 |
| 7796(2) | 0 | 20 | 20 | 10 | 50 | 0 | 1050 | 0 |
| 7796 | 5 | 55 | 5 | 35 | 0 | 1 | 350 | 0 |
| 7796 | 40 | 10 | 30 | 20 | 0 | 20 | 210 | 0 |

| **Bird-ID** | **Litter % 10m W** | **Grass % 10m W** | **Forbs % 10m W** | **Bare % 10m W** | **Shrubs % 10m W** | **Litter Depth (cm) 10m W** | **Tallest Plant (cm) 10m W** | **Exotic 10m W** |
|---|---|---|---|---|---|---|---|---|
| 6794 | 5 | 60 | 0 | 35 | 0 | 1 | 28 | 0 |
| 6794 | 5 | 30 | 15 | 55 | 0 | 1 | 52 | 0 |
| 7616 | 5 | 40 | 5 | 50 | 0 | 1 | 50 | 0 |
| 7616 | 15 | 45 | 5 | 35 | 0 | 2 | 40 | 0 |
| 7694 | 10 | 35 | 45 | 10 | 0 | 1 | 37 | 0 |
| 7694 | 5 | 30 | 25 | 40 | 0 | 1 | 21 | 0 |
| 6762 | 5 | 55 | 15 | 25 | 0 | 1 | 43 | 0 |
| 6762 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612 | 10 | 45 | 5 | 40 | 0 | 1 | 25 | 0 |
| 7612 | 10 | 5 | 25 | 30 | 20 | 1 | 89 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6755 | 10 | 20 | 30 | 40 | 0 | 1 | 39 | 0 |
| 6755 | 20 | 5 | 0 | 0 | 75 | 1 | 65 | 0 |
| 7616(2) | 10 | 0 | 25 | 65 | 0 | 1 | 15 | 0 |
| 7616(2) | 35 | 5 | 10 | 35 | 15 | 3 | 45 | 0 |
| 6776 | 30 | 65 | 5 | 0 | 0 | 4 | 37 | 0 |
| 6776 | 10 | 65 | 10 | 15 | 0 | 1 | 33 | 0 |
| 7612(2) | 0 | 60 | 20 | 20 | 0 | 0 | 20 | 0 |
| 7612(2) | 5 | 5 | 25 | 65 | 0 | 1 | 28 | 0 |
| 5711 | 5 | 15 | 30 | 50 | 0 | 1 | 32 | 0 |
| 5711 | 5 | 5 | 40 | 50 | 0 | 1 | 35 | 0 |
| 6784 | 15 | 10 | 20 | 40 | 15 | 3 | 43 | 0 |
| 6784 | 5 | 30 | 5 | 60 | 0 | 1 | 29 | 0 |
| 6786 | 5 | 70 | 20 | 5 | 0 | 1 | 48 | 0 |
| 6786 | 0 | 20 | 5 | 75 | 0 | 0 | 170 | 0 |
| 6788 | 0 | 85 | 10 | 5 | 0 | 0 | 50 | 0 |
| 6788 | 5 | 50 | 5 | 40 | 0 | 1 | 58 | 0 |
| 6793 | 10 | 65 | 25 | 0 | 0 | 4 | 57 | 0 |
| 6793 | 5 | 55 | 10 | 0 | 30 | 2 | 68 | 0 |
| 6413(2) | 50 | 15 | 5 | 30 | 0 | 50 | 345 | 0 |
| 6423(2) | 20 | 10 | 15 | 45 | 10 | 55 | 470 | 0 |
| 7778(2) | 10 | 75 | 5 | 10 | 0 | 5 | 465 | 0 |
| 7778(2) | 15 | 45 | 25 | 15 | 0 | 15 | 960 | 0 |
| 6421(2) | 10 | 40 | 25 | 25 | 0 | 20 | 655 | 0 |
| 6421(2) | 25 | 35 | 25 | 5 | 10 | 5 | 650 | 0 |
| 7796(3) | 10 | 25 | 5 | 60 | 0 | 1 | 540 | 0 |
| 7796(3) | 10 | 20 | 10 | 45 | 15 | 25 | 445 | 0 |
| 7754(3) | 5 | 40 | 30 | 25 | 0 | 1 | 260 | 0 |
| 7754(3) | 10 | 75 | 15 | 0 | 0 | 350 | 650 | 0 |
| 7754(2) | 10 | 45 | 35 | 10 | 0 | 2 | 300 | 0 |
| 7754(2) | 35 | 35 | 15 | 15 | 0 | 15 | 500 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6421 | 15 | 60 | 10 | 0 | 15 | 80 | 775 | 0 |
| 6421 | 35 | 50 | 15 | 0 | 0 | 40 | 735 | 0 |
| 6413 | 45 | 10 | 40 | 5 | 0 | 35 | 380 | 0 |
| 6413 | 15 | 30 | 10 | 15 | 30 | 5 | 440 | 0 |
| 7777(2) | 10 | 45 | 5 | 40 | 0 | 10 | 260 | 0 |
| 7777(2) | 25 | 50 | 5 | 20 | 0 | 30 | 245 | 0 |
| 7758(2) | 10 | 25 | 10 | 5 | 50 | 40 | 510 | 0 |
| 7758(2) | 40 | 20 | 5 | 5 | 30 | 15 | 390 | 0 |
| 7758(3) | 10 | 30 | 15 | 45 | 0 | 10 | 610 | 0 |
| 7758(3) | 5 | 30 | 10 | 55 | 0 | 15 | 370 | 0 |
| 7758 | 5 | 30 | 15 | 50 | 0 | 1 | 560 | 0 |
| 7758 | 25 | 30 | 5 | 40 | 0 | 15 | 330 | 0 |
| 7778 | 50 | 30 | 10 | 10 | 0 | 40 | 121 | 0 |
| 7778 | 30 | 30 | 10 | 30 | 0 | 30 | 65 | 0 |
| 5781 | 0 | 30 | 0 | 5 | 65 | 0 | 380 | 0 |
| 5781 | 35 | 30 | 0 | 35 | 0 | 1 | 85 | 0 |
| 7764 | 30 | 30 | 10 | 30 | 0 | 20 | 240 | 0 |
| 7764 | 35 | 50 | 15 | 0 | 0 | 60 | 710 | 0 |
| 7786 | 10 | 0 | 10 | 0 | 80 | 30 | 840 | 0 |
| 7786 | 20 | 15 | 40 | 25 | 0 | 5 | 430 | 0 |
| 7777 | 10 | 85 | 5 | 0 | 0 | 10 | 750 | 0 |
| 7777 | 25 | 25 | 25 | 25 | 0 | 10 | 180 | 0 |
| 6531 | 0 | 65 | 10 | 25 | 0 | 0 | 310 | 0 |
| 6531 | 5 | 50 | 15 | 0 | 20 | 30 | 755 | 0 |
| 7754 | 0 | 40 | 0 | 60 | 0 | 0 | 460 | 0 |
| 7754 | 0 | 20 | 10 | 70 | 0 | 0 | 285 | 0 |
| 7796(2) | 10 | 65 | 10 | 15 | 0 | 1 | 301 | 0 |
| 7796(2) | 10 | 65 | 25 | 0 | 0 | 2 | 722 | 0 |
| 7796 | 20 | 60 | 10 | 10 | 0 | 2 | 580 | 0 |
| 7796 | 45 | 15 | 20 | 20 | 0 | 40 | 470 | 0 |

| Bird-ID | Litter % 15m N | Grass % 15m N | Forbs % 15m N | Bare % 15m N | Shrubs % 15m N | Litter Depth (cm) 15m N | Tallest Plant (cm) 15m N | Exotic 15m N |
|---|---|---|---|---|---|---|---|---|
| 6794 | 0 | 10 | 10 | 80 | 0 | 0 | 27 | 0 |
| 6794 | 5 | 5 | 30 | 60 | 0 | 1 | 25 | 0 |
| 7616 | 5 | 30 | 5 | 60 | 0 | 1 | 42 | 0 |
| 7616 | 5 | 10 | 85 | 0 | 0 | 1 | 37 | 0 |
| 7694 | 5 | 25 | 25 | 45 | 0 | 1 | 30 | 0 |
| 7694 | 10 | 5 | 85 | 0 | 0 | 2 | 44 | 0 |
| 6762 | 10 | 70 | 0 | 10 | 0 | 1 | 33 | 0 |
| 6762 | 0 | 70 | 0 | 30 | 0 | 0 | 20 | 0 |
| 7612 | 5 | 40 | 15 | 40 | 0 | 1 | 35 | 0 |
| 7612 | 75 | 15 | 10 | 0 | 0 | 2 | 37 | 0 |
| 6755 | 25 | 25 | 15 | 5 | 30 | 2 | 40 | 0 |
| 6755 | 0 | 5 | 0 | 5 | 80 | 0 | 104 | 0 |
| 7616(2) | 0 | 0 | 5 | 95 | 0 | 0 | 20 | 0 |
| 7616(2) | 5 | 25 | 20 | 50 | 0 | 1 | 43 | 0 |
| 6776 | 0 | 60 | 10 | 30 | 0 | 0 | 24 | 0 |
| 6776 | 10 | 60 | 25 | 5 | 0 | 2 | 45 | 0 |
| 7612(2) | 5 | 60 | 20 | 15 | 0 | 1 | 31 | 0 |
| 7612(2) | 15 | 5 | 35 | 45 | 0 | 1 | 31 | 0 |
| 5711 | 5 | 30 | 30 | 35 | 0 | 1 | 73 | 0 |
| 5711 | 5 | 70 | 25 | 0 | 0 | 1 | 64 | 0 |
| 6784 | 5 | 0 | 15 | 80 | 0 | 1 | 25 | 0 |
| 6784 | 10 | 30 | 5 | 55 | 0 | 1 | 55 | 0 |
| 6786 | 0 | 65 | 25 | 10 | 0 | 0 | 21 | 0 |
| 6786 | 10 | 60 | 5 | 25 | 0 | 1 | 47 | 0 |
| 6788 | 0 | 30 | 70 | 0 | 0 | 0 | 87 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6788 | 5 | 85 | 0 | 10 | 0 | 1 | 59 | 0 |
| 6793 | 65 | 25 | 10 | 0 | 0 | 4 | 55 | 0 |
| 6793 | 0 | 35 | 35 | 30 | 0 | 0 | 75 | 0 |
| 6413(2) | 40 | 25 | 15 | 20 | 0 | 25 | 575 | 0 |
| 6423(2) | 35 | 30 | 10 | 0 | 25 | 70 | 690 | 0 |
| 7778(2) | 15 | 55 | 5 | 25 | 0 | 40 | 645 | 0 |
| 7778(2) | 30 | 50 | 5 | 15 | 0 | 20 | 310 | 0 |
| 6421(2) | 5 | 20 | 25 | 50 | 0 | 1 | 270 | 0 |
| 6421(2) | 30 | 35 | 15 | 10 | 10 | 75 | 930 | 0 |
| 7796(3) | 5 | 35 | 10 | 50 | 0 | 1 | 445 | 0 |
| 7796(3) | 45 | 25 | 0 | 0 | 30 | 100 | 510 | 0 |
| 7754(3) | 10 | 40 | 35 | 15 | 0 | 5 | 430 | 0 |
| 7754(3) | 25 | 45 | 0 | 30 | 0 | 5 | 240 | 0 |
| 7754(2) | 10 | 70 | 10 | 10 | 0 | 2 | 260 | 0 |
| 7754(2) | 55 | 15 | 20 | 10 | 0 | 25 | 220 | 0 |
| 6421 | 50 | 25 | 15 | 10 | 0 | 28 | 620 | 0 |
| 6421 | 25 | 35 | 25 | 15 | 0 | 510 | 965 | 0 |
| 6413 | 45 | 15 | 30 | 10 | 0 | 80 | 185 | 0 |
| 6413 | 10 | 20 | 5 | 5 | 60 | 30 | 1090 | 0 |
| 7777(2) | 30 | 60 | 5 | 5 | 0 | 15 | 329 | 0 |
| 7777(2) | 50 | 40 | 5 | 5 | 0 | 75 | 295 | 0 |
| 7758(2) | 25 | 35 | 10 | 30 | 0 | 25 | 1050 | 0 |
| 7758(2) | 25 | 20 | 5 | 50 | 0 | 40 | 540 | 0 |
| 7758(3) | 15 | 50 | 15 | 20 | 0 | 10 | 520 | 0 |
| 7758(3) | 10 | 65 | 10 | 15 | 0 | 20 | 320 | 0 |
| 7758 | 5 | 30 | 5 | 50 | 10 | 5 | 403 | 0 |
| 7758 | 10 | 30 | 5 | 40 | 15 | 25 | 305 | 0 |
| 7778 | 45 | 30 | 25 | 0 | 0 | 30 | 901 | 0 |
| 7778 | 20 | 15 | 15 | 50 | 0 | 10 | 330 | 0 |
| 5781 | 0 | 20 | 5 | 0 | 75 | 0 | 700 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5781 | 45 | 45 | 10 | 0 | 0 | 60 | 530 | 0 |
| 7764 | 10 | 30 | 10 | 50 | 0 | 2 | 350 | 0 |
| 7764 | 70 | 10 | 20 | 0 | 0 | 90 | 1030 | 0 |
| 7786 | 60 | 15 | 15 | 0 | 10 | 5 | 460 | 0 |
| 7786 | 25 | 10 | 15 | 50 | 0 | 5 | 390 | 0 |
| 7777 | 0 | 80 | 5 | 10 | 5 | 10 | 600 | 0 |
| 7777 | 35 | 15 | 40 | 10 | 0 | 20 | 180 | 0 |
| 6531 | 5 | 50 | 20 | 0 | 25 | 20 | 710 | 0 |
| 6531 | 0 | 15 | 5 | 80 | 0 | 0 | 150 | 0 |
| 7754 | 0 | 25 | 5 | 70 | 0 | 0 | 380 | 0 |
| 7754 | 0 | 50 | 10 | 40 | 0 | 0 | 483 | 0 |
| 7796(2) | 10 | 35 | 0 | 55 | 0 | 3 | 70 | 0 |
| 7796(2) | 40 | 20 | 30 | 0 | 10 | 10 | 830 | 0 |
| 7796 | 20 | 15 | 15 | 50 | 0 | 2 | 400 | 0 |
| 7796 | 30 | 35 | 5 | 0 | 30 | 10 | 440 | 0 |

| **Bird-ID** | **Litter % 15m E** | **Grass % 15m E** | **Forbs % 15m E** | **Bare % 15m E** | **Shrubs % 15m E** | **Litter Depth (cm) 15m E** | **Tallest Plant (cm) 15m E** | **Exotic 15m E** |
|---|---|---|---|---|---|---|---|---|
| 6794 | 10 | 20 | 25 | 40 | 5 | 1 | 24 | 0 |
| 6794 | 0 | 35 | 15 | 50 | 0 | 0 | 27 | 0 |
| 7616 | 10 | 20 | 20 | 50 | 0 | 1 | 38 | 0 |
| 7616 | 5 | 25 | 10 | 60 | 0 | 1 | 18 | 0 |
| 7694 | 10 | 30 | 55 | 5 | 0 | 2 | 60 | 0 |
| 7694 | 5 | 40 | 55 | 0 | 0 | 1 | 46 | 0 |
| 6762 | 15 | 15 | 20 | 50 | 0 | 3 | 30 | 0 |
| 6762 | 5 | 0 | 0 | 90 | 5 | 10 | 4 | 0 |
| 7612 | 5 | 20 | 75 | 0 | 0 | 2 | 48 | 0 |
| 7612 | 5 | 50 | 25 | 20 | 0 | 1 | 62 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6755 | 5 | 5 | 20 | 55 | 15 | 1 | 49 | 0 |
| 6755 | 5 | 10 | 40 | 45 | 0 | 1 | 70 | 0 |
| 7616(2) | 10 | 5 | 35 | 50 | 0 | 10 | 40 | 0 |
| 7616(2) | 5 | 20 | 5 | 20 | 0 | 1 | 19 | 0 |
| 6776 | 5 | 60 | 0 | 35 | 0 | 1 | 21 | 0 |
| 6776 | 5 | 25 | 0 | 70 | 0 | 1 | 26 | 0 |
| 7612(2) | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 7612(2) | 30 | 50 | 10 | 10 | 0 | 3 | 79 | 0 |
| 5711 | 0 | 50 | 30 | 20 | 0 | 0 | 39 | 0 |
| 5711 | 5 | 0 | 5 | 90 | 0 | 1 | 21 | 0 |
| 6784 | 5 | 5 | 5 | 85 | 0 | 1 | 8 | 0 |
| 6784 | 15 | 65 | 0 | 20 | 0 | 3 | 50 | 0 |
| 6786 | 5 | 15 | 10 | 70 | 0 | 1 | 16 | 0 |
| 6786 | 0 | 50 | 50 | 0 | 0 | 0 | 19 | 0 |
| 6788 | 5 | 10 | 20 | 65 | 0 | 1 | 23 | 0 |
| 6788 | 0 | 75 | 20 | 5 | 0 | 0 | 80 | 0 |
| 6793 | 5 | 15 | 75 | 5 | 0 | 1 | 54 | 0 |
| 6793 | 5 | 65 | 5 | 25 | 0 | 1 | 60 | 0 |
| 6413(2) | 35 | 20 | 5 | 5 | 35 | 30 | 730 | 0 |
| 6423(2) | 40 | 60 | 0 | 0 | 0 | 50 | 300 | 0 |
| 7778(2) | 5 | 30 | 20 | 0 | 45 | 2 | 650 | 0 |
| 7778(2) | 25 | 40 | 15 | 20 | 0 | 65 | 465 | 0 |
| 6421(2) | 20 | 30 | 25 | 25 | 0 | 30 | 555 | 0 |
| 6421(2) | 15 | 10 | 45 | 10 | 20 | 30 | 625 | 0 |
| 7796(3) | 15 | 50 | 0 | 25 | 10 | 4 | 610 | 0 |
| 7796(3) | 10 | 60 | 10 | 20 | 0 | 10 | 485 | 0 |
| 7754(3) | 6 | 65 | 10 | 20 | 0 | 2 | 430 | 0 |
| 7754(3) | 5 | 75 | 0 | 20 | 0 | 5 | 170 | 0 |
| 7754(2) | 55 | 20 | 25 | 0 | 0 | 20 | 710 | 0 |
| 7754(2) | 25 | 60 | 10 | 5 | 0 | 20 | 530 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6421 | 20 | 55 | 10 | 15 | 0 | 35 | 470 | 0 |
| 6421 | 10 | 15 | 10 | 55 | 10 | 110 | 630 | 0 |
| 6413 | 25 | 30 | 40 | 5 | 0 | 70 | 590 | 0 |
| 6413 | 25 | 20 | 0 | 35 | 20 | 80 | 385 | 0 |
| 7777(2) | 5 | 50 | 5 | 40 | 0 | 65 | 175 | 0 |
| 7777(2) | 25 | 40 | 5 | 30 | 0 | 15 | 200 | 0 |
| 7758(2) | 15 | 30 | 15 | 5 | 35 | 2 | 790 | 0 |
| 7758(2) | 35 | 35 | 5 | 10 | 15 | 20 | 730 | 0 |
| 7758(3) | 30 | 50 | 15 | 5 | 0 | 30 | 570 | 0 |
| 7758(3) | 5 | 10 | 10 | 60 | 15 | 2 | 550 | 0 |
| 7758 | 30 | 25 | 5 | 40 | 0 | 25 | 230 | 0 |
| 7758 | 10 | 10 | 30 | 50 | 0 | 20 | 660 | 0 |
| 7778 | 40 | 10 | 5 | 45 | 0 | 2 | 60 | 0 |
| 7778 | 45 | 30 | 15 | 10 | 0 | 20 | 400 | 0 |
| 5781 | 30 | 10 | 10 | 50 | 0 | 2 | 705 | 0 |
| 5781 | 10 | 25 | 5 | 60 | 0 | 1 | 80 | 0 |
| 7764 | 10 | 75 | 10 | 5 | 0 | 50 | 550 | 0 |
| 7764 | 60 | 10 | 20 | 0 | 10 | 60 | 880 | 0 |
| 7786 | 5 | 65 | 10 | 20 | 0 | 20 | 210 | 0 |
| 7786 | 25 | 5 | 30 | 20 | 20 | 15 | 410 | 0 |
| 7777 | 50 | 20 | 15 | 5 | 10 | 10 | 340 | 0 |
| 7777 | 45 | 25 | 0 | 10 | 20 | 15 | 740 | 0 |
| 6531 | 0 | 25 | 5 | 70 | 0 | 0 | 270 | 0 |
| 6531 | 0 | 25 | 10 | 65 | 0 | 0 | 580 | 0 |
| 7754 | 0 | 5 | 10 | 85 | 0 | 0 | 160 | 0 |
| 7754 | 0 | 5 | 10 | 85 | 0 | 0 | 397 | 0 |
| 7796(2) | 20 | 45 | 25 | 10 | 0 | 1 | 550 | 0 |
| 7796(2) | 15 | 0 | 15 | 15 | 20 | 580 | 0 | 0 |
| 7796 | 25 | 40 | 20 | 5 | 10 | 1 | 210 | 0 |
| 7796 | 10 | 30 | 25 | 35 | 0 | 40 | 540 | 0 |

| Bird-ID | Litter % 15m S | Grass % 15m S | Forbs % 15m S | Bare % 15m S | Shrubs % 15m S | Litter Depth (cm) 15m S | Tallest Plant (cm) 15m S | Exotic 15m S |
|---|---|---|---|---|---|---|---|---|
| 6794 | 5 | 55 | 15 | 25 | 0 | 1 | 52 | 0 |
| 6794 | 0 | 5 | 25 | 75 | 0 | 0 | 24 | 0 |
| 7616 | 30 | 0 | 0 | 0 | 70 | 4 | 58 | 0 |
| 7616 | 25 | 35 | 15 | 25 | 0 | 3 | 32 | 0 |
| 7694 | 10 | 20 | 55 | 15 | 0 | 1 | 53 | 0 |
| 7694 | 0 | 20 | 75 | 5 | 0 | 0 | 27 | 0 |
| 6762 | 20 | 52 | 20 | 35 | 0 | 2 | 40 | 0 |
| 6762 | 0 | 0 | 5 | 95 | 0 | 0 | 5 | 0 |
| 7612 | 5 | 55 | 30 | 10 | 0 | 1 | 26 | 0 |
| 7612 | 10 | 55 | 15 | 20 | 0 | 1 | 34 | 0 |
| 6755 | 5 | 30 | 10 | 55 | 0 | 1 | 32 | 0 |
| 6755 | 20 | 70 | 0 | 5 | 5 | 2 | 28 | 0 |
| 7616(2) | 5 | 0 | 65 | 30 | 0 | 1 | 46 | 0 |
| 7616(2) | 5 | 20 | 30 | 50 | 0 | 1 | 82 | 0 |
| 6776 | 0 | 25 | 40 | 25 | 0 | 2 | 36 | 0 |
| 6776 | 5 | 75 | 0 | 20 | 0 | 1 | 35 | 0 |
| 7612(2) | 10 | 45 | 45 | 0 | 0 | 1 | 40 | 0 |
| 7612(2) | 15 | 40 | 35 | 10 | 0 | 1 | 59 | 0 |
| 5711 | 0 | 75 | 5 | 20 | 0 | 0 | 29 | 0 |
| 5711 | 10 | 0 | 45 | 45 | 0 | 1 | 56 | 0 |
| 6784 | 5 | 10 | 45 | 40 | 0 | 1 | 24 | 0 |
| 6784 | 10 | 10 | 10 | 70 | 0 | 1 | 32 | 0 |
| 6786 | 0 | 5 | 0 | 95 | 0 | 0 | 4 | 0 |
| 6786 | 5 | 65 | 15 | 15 | 0 | 1 | 50 | 0 |
| 6788 | 10 | 20 | 70 | 0 | 0 | 1 | 59 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6788 | 5 | 70 | 5 | 20 | 0 | 1 | 70 | 0 |
| 6793 | 5 | 10 | 60 | 20 | 5 | 1 | 32 | 0 |
| 6793 | 5 | 70 | 5 | 20 | 0 | 1 | 50 | 0 |
| 6413(2) | 30 | 40 | 0 | 30 | 0 | 50 | 330 | 0 |
| 6423(2) | 5 | 20 | 10 | 15 | 50 | 60 | 590 | 0 |
| 7778(2) | 5 | 60 | 20 | 15 | 0 | 3 | 495 | 0 |
| 7778(2) | 20 | 55 | 0 | 25 | 0 | 7 | 456 | 0 |
| 6421(2) | 10 | 45 | 15 | 30 | 0 | 3 | 450 | 0 |
| 6421(2) | 30 | 30 | 30 | 0 | 10 | 15 | 460 | 0 |
| 7796(3) | 10 | 30 | 10 | 50 | 0 | 1 | 601 | 0 |
| 7796(3) | 5 | 15 | 0 | 80 | 0 | 2 | 335 | 0 |
| 7754(3) | 10 | 45 | 25 | 20 | 0 | 3 | 695 | 0 |
| 7754(3) | 10 | 75 | 5 | 10 | 0 | 20 | 360 | 0 |
| 7754(2) | 40 | 55 | 5 | 0 | 0 | 275 | 875 | 0 |
| 7754(2) | 45 | 40 | 0 | 5 | 10 | 80 | 410 | 0 |
| 6421 | 10 | 20 | 5 | 65 | 0 | 30 | 850 | 0 |
| 6421 | 55 | 10 | 30 | 5 | 0 | 110 | 1170 | 0 |
| 6413 | 35 | 30 | 25 | 5 | 5 | 40 | 390 | 0 |
| 6413 | 10 | 15 | 20 | 15 | 40 | 155 | 670 | 0 |
| 7777(2) | 25 | 25 | 15 | 35 | 0 | 25 | 195 | 0 |
| 7777(2) | 30 | 30 | 5 | 35 | 0 | 30 | 215 | 0 |
| 7758(2) | 10 | 25 | 15 | 50 | 0 | 20 | 980 | 0 |
| 7758(2) | 30 | 65 | 5 | 0 | 0 | 50 | 810 | 0 |
| 7758(3) | 20 | 65 | 15 | 10 | 0 | 60 | 525 | 0 |
| 7758(3) | 5 | 35 | 25 | 10 | 25 | 2 | 810 | 0 |
| 7758 | 15 | 35 | 10 | 40 | 0 | 5 | 1060 | 0 |
| 7758 | 10 | 60 | 20 | 5 | 5 | 30 | 810 | 0 |
| 7778 | 30 | 55 | 15 | 0 | 0 | 40 | 160 | 0 |
| 7778 | 35 | 25 | 5 | 35 | 0 | 15 | 65 | 0 |
| 5781 | 10 | 45 | 10 | 35 | 0 | 2 | 560 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5781 | 15 | 0 | 5 | 0 | 80 | 30 | 830 | 0 |
| 7764 | 10 | 55 | 20 | 5 | 10 | 2 | 601 | 0 |
| 7764 | 25 | 50 | 25 | 0 | 0 | 55 | 1210 | 0 |
| 7786 | 5 | 5 | 30 | 60 | 0 | 5 | 900 | 0 |
| 7786 | 10 | 75 | 10 | 0 | 5 | 20 | 340 | 0 |
| 7777 | 50 | 25 | 10 | 15 | 0 | 10 | 480 | 0 |
| 7777 | 30 | 15 | 20 | 35 | 0 | 10 | 720 | 0 |
| 6531 | 5 | 25 | 5 | 10 | 55 | 20 | 400 | 0 |
| 6531 | 0 | 80 | 10 | 10 | 0 | 0 | 760 | 0 |
| 7754 | 5 | 30 | 15 | 10 | 40 | 10 | 380 | 0 |
| 7754 | 0 | 10 | 0 | 90 | 0 | 0 | 145 | 0 |
| 7796(2) | 10 | 55 | 0 | 35 | 0 | 1 | 120 | 0 |
| 7796(2) | 20 | 50 | 25 | 5 | 0 | 20 | 230 | 0 |
| 7796 | 10 | 30 | 0 | 10 | 0 | 10 | 1130 | 0 |
| 7796 | 45 | 25 | 15 | 15 | 0 | 10 | 190 | 0 |

| **Bird-ID** | **Litter % 15m W** | **Grass % 15m W** | **Forbs % 15m W** | **Bare % 15m W** | **Shrubs % 15m W** | **Litter Depth (cm) 15m W** | **Tallest Plant (cm) 15m W** | **Exotic 15m W** |
|---|---|---|---|---|---|---|---|---|
| 6794 | 5 | 10 | 10 | 75 | 0 | 1 | 28 | 0 |
| 6794 | 0 | 35 | 25 | 40 | 0 | 0 | 30 | 0 |
| 7616 | 5 | 25 | 10 | 60 | 0 | 1 | 42 | 0 |
| 7616 | 5 | 15 | 40 | 40 | 0 | 1 | 37 | 0 |
| 7694 | 5 | 35 | 20 | 40 | 0 | 1 | 39 | 0 |
| 7694 | 5 | 45 | 10 | 5 | 35 | 1 | 31 | 0 |
| 6762 | 25 | 10 | 25 | 30 | 10 | 2 | 33 | 0 |
| 6762 | 0 | 0 | 0 | 95 | 5 | 0 | 2 | 0 |
| 7612 | 20 | 60 | 10 | 10 | 0 | 2 | 26 | 0 |
| 7612 | 10 | 40 | 15 | 35 | 0 | 1 | 31 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6755 | 5 | 35 | 20 | 40 | 0 | 1 | 37 | 0 |
| 6755 | 10 | 40 | 25 | 25 | 0 | 1 | 31 | 0 |
| 7616(2) | 5 | 10 | 15 | 65 | 5 | 1 | 40 | 0 |
| 7616(2) | 20 | 10 | 25 | 40 | 15 | 2 | 49 | 0 |
| 6776 | 0 | 80 | 10 | 10 | 0 | 0 | 32 | 0 |
| 6776 | 5 | 60 | 10 | 25 | 0 | 1 | 23 | 0 |
| 7612(2) | 10 | 65 | 20 | 5 | 0 | 1 | 28 | 0 |
| 7612(2) | 25 | 35 | 30 | 10 | 0 | 2 | 82 | 0 |
| 5711 | 0 | 35 | 40 | 25 | 0 | 0 | 19 | 0 |
| 5711 | 0 | 85 | 5 | 10 | 0 | 0 | 62 | 0 |
| 6784 | 10 | 15 | 20 | 25 | 30 | 2 | 47 | 0 |
| 6784 | 5 | 10 | 5 | 80 | 0 | 1 | 22 | 0 |
| 6786 | 0 | 80 | 20 | 0 | 0 | 0 | 37 | 0 |
| 6786 | 0 | 80 | 20 | 0 | 0 | 0 | 62 | 0 |
| 6788 | 10 | 40 | 45 | 5 | 0 | 1 | 57 | 0 |
| 6788 | 10 | 85 | 0 | 5 | 0 | 2 | 56 | 0 |
| 6793 | 10 | 50 | 25 | 5 | 10 | 2 | 64 | 0 |
| 6793 | 5 | 65 | 20 | 10 | 0 | 1 | 54 | 0 |
| 6413(2) | 35 | 45 | 0 | 20 | 0 | 50 | 285 | 0 |
| 6423(2) | 45 | 30 | 10 | 15 | 10 | 40 | 630 | 0 |
| 7778(2) | 10 | 60 | 25 | 5 | 0 | 60 | 675 | 0 |
| 7778(2) | 20 | 40 | 0 | 40 | 0 | 40 | 290 | 0 |
| 6421(2) | 15 | 40 | 35 | 10 | 0 | 30 | 470 | 0 |
| 6421(2) | 10 | 55 | 15 | 20 | 0 | 20 | 395 | 0 |
| 7796(3) | 5 | 55 | 5 | 35 | 0 | 1 | 350 | 0 |
| 7796(3) | 15 | 30 | 5 | 40 | 10 | 35 | 325 | 0 |
| 7754(3) | 10 | 45 | 40 | 5 | 0 | 1 | 710 | 0 |
| 7754(3) | 5 | 80 | 0 | 15 | 0 | 5 | 240 | 0 |
| 7754(2) | 35 | 50 | 15 | 0 | 0 | 30 | 610 | 0 |
| 7754(2) | 20 | 50 | 30 | 0 | 0 | 45 | 410 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6421 | 40 | 40 | 10 | 10 | 0 | 35 | 360 | 0 |
| 6421 | 45 | 45 | 10 | 0 | 0 | 30 | 260 | 0 |
| 6413 | 55 | 35 | 5 | 5 | 0 | 60 | 190 | 0 |
| 6413 | 40 | 10 | 25 | 10 | 15 | 50 | 850 | 0 |
| 7777(2) | 55 | 40 | 5 | 0 | 0 | 30 | 260 | 0 |
| 7777(2) | 45 | 45 | 5 | 5 | 0 | 1 | 195 | 0 |
| 7758(2) | 30 | 15 | 25 | 20 | 0 | 25 | 445 | 0 |
| 7758(2) | 25 | 55 | 5 | 5 | 10 | 25 | 770 | 0 |
| 7758(3) | 25 | 20 | 15 | 5 | 35 | 15 | 1070 | 0 |
| 7758(3) | 15 | 65 | 5 | 10 | 5 | 20 | 500 | 0 |
| 7758 | 10 | 5 | 20 | 35 | 30 | 15 | 890 | 0 |
| 7758 | 30 | 35 | 5 | 30 | 0 | 20 | 405 | 0 |
| 7778 | 35 | 5 | 25 | 5 | 35 | 260 | 1003 | 0 |
| 7778 | 30 | 40 | 25 | 5 | 0 | 15 | 530 | 0 |
| 5781 | 5 | 70 | 5 | 10 | 10 | 1 | 520 | 0 |
| 5781 | 10 | 20 | 15 | 55 | 0 | 1 | 100 | 0 |
| 7764 | 15 | 40 | 0 | 45 | 0 | 1 | 100 | 0 |
| 7764 | 60 | 5 | 10 | 25 | 0 | 10 | 170 | 0 |
| 7786 | 5 | 5 | 5 | 70 | 15 | 5 | 100 | 0 |
| 7786 | 30 | 20 | 25 | 25 | 0 | 5 | 120 | 0 |
| 7777 | 40 | 25 | 20 | 10 | 5 | 10 | 350 | 0 |
| 7777 | 15 | 25 | 50 | 10 | 0 | 10 | 940 | 0 |
| 6531 | 0 | 50 | 0 | 5 | 45 | 0 | 530 | 0 |
| 6531 | 5 | 55 | 15 | 25 | 0 | 10 | 550 | 0 |
| 7754 | 0 | 50 | 5 | 40 | 5 | 0 | 520 | 0 |
| 7754 | 0 | 5 | 5 | 90 | 0 | 0 | 163 | 0 |
| 7796(2) | 10 | 75 | 10 | 5 | 0 | 15 | 830 | 0 |
| 7796(2) | 10 | 0 | 65 | 10 | 15 | 10 | 5ft | 0 |
| 7796 | 5 | 55 | 25 | 15 | 0 | 1 | 280 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7796 | 15 | 45 | 20 | 20 | 0 | 10 | 365 | 0 |

*Table 6. AIC Table from Logistic Regression Analysis of Nest Site Selection Characteristics by Scaled Quail* **(***Callipepla squamata***)** *Hens in the Southern High Plains of Texas (April 1 – August 15) 2019 and 2020, Ground Cover Measurements (%), 95th and 25th Quantile = Calculated from Empirical Distribution Function (95% of temperatures that occurred below 39° C and 5% occurred above) (25% of temperatures that occurred below 39° C and 75% that occurred above 39° C), # of Increments of Lethal Temperature = Number of temperature recordings at the nest over 40° C*

| Model | K | AICc | Delta_AICc | AICcWt | Cum.Wt | LL |
|---|---|---|---|---|---|---|
| Ground cover percentages at point center | 6 | 45.78 | 0 | 0.83 | 0.83 | -16.28 |
| 95th Quantile and percent shrub and grass | 5 | 49.1 | 3.32 | 0.16 | 0.99 | -19.12 |
| Percent shrub among all transects | 6 | 55.1 | 9.32 | 0.01 | 1 | -20.94 |
| 95th Quantile and 25th Quantile | 3 | 62.71 | 16.93 | 0 | 1 | -28.19 |
| Percent bare ground at point center and 5 m | 3 | 67.36 | 21.59 | 0 | 1 | -30.52 |
| Ground cover percentages at 1 m | 6 | 87.13 | 41.35 | 0 | 1 | -36.96 |
| Percent grass at point center and 1 m | 3 | 94.32 | 48.54 | 0 | 1 | -43.99 |
| Percent forb at point center and 1 m | 3 | 98.18 | 52.41 | 0 | 1 | -45.93 |
| # of Increments of Lethal Temperature and Total Precipitation | 3 | 99.79 | 54.01 | 0 | 1 | -46.71 |
| Null | 1 | 107.41 | 61.63 | 0 | 1 | -52.68 |
| Mesquite and broomweed within 50 m radius | 3 | 110.86 | 65.08 | 0 | 1 | -52.27 |
| Percent litter at point center to 10 m | 4 | 111.45 | 65.67 | 0 | 1 | -51.44 |
| Ground cover percentages at 5 m | 5 | 112.26 | 66.48 | 0 | 1 | -50.7 |
| Ground cover percentages at 10 m | 5 | 114.12 | 68.34 | 0 | 1 | -51.63 |
| Ground cover percentages at 15 m | 5 | 114.73 | 68.95 | 0 | 1 | -51.94 |

***Table 7. Output from Top Logistic Regression Model Analysis of Nest Site Selection Characteristics of Scaled Quail (Callipepla squamata) Hens (n=39) in the Southern High Plains of Texas (April 1 – August 15) 2019 and 2020, Ground Cover Measurements (%) at Point Center, 95$^{th}$ Quantile = Calculated from Empirical Distribution Function (95% of temperatures that occurred below 39° C and 5% occurred above)***

| Variable | Beta | 90th CI Lower | 90th CI Upper |
|---|---|---|---|
| (Intercept) | 3.34 | 0.24 | 6.43 |
| %Litter | -2.14 | -3.93 | -0.34 |
| %Forb | -2.97 | -5.22 | -0.71 |
| %Bare Ground | -3.39 | -6.24 | -0.53 |
| %Shrub | 4.62 | -0.68 | 9.92 |
| %Grass | -1.92 | -4.78 | 0.95 |
| 95th Quantile | -2.87 | -6.38 | 0.63 |
| %Shrub:95th Quantile | -1.13 | -5.43 | 3.18 |

***Table 8. Accuracy Assessment Results for 8 Maximum Likelihood Classified Images of the Study Site in the Southern High Plains of Texas***

| Accuracy Assessment 2019 (1) | Class Name | Reference Totals | Classified Totals | # Correct | Producer's Accuracy | User's Accuracy |
|---|---|---|---|---|---|---|
| | Cholla | 66 | 51 | 34 | 66.67 | 51.52 |
| | Yucca | 96 | 51 | 46 | 90.20 | 47.92 |
| | Bare Ground | 49 | 51 | 48 | 94.12 | 97.96 |
| | Herbaceous Shrub | 47 | 51 | 22 | 43.14 | 46.81 |
| | Grassland | 89 | 135 | 72 | 53.33 | 80.90 |
| | Woody Vegetation | 43 | 51 | 37 | 72.55 | 86.05 |
| | Totals: | 390 | 390 | 43 | | |
| Overall Classification Accuracy: 85.76% | | | | | | |
| Kappa Coefficient: 0.590 | | | | | | |
| 2019 (2) | | | | | | |
| | Cholla | 73 | 51 | 48 | 94.12 | 65.75 |
| | Yucca | 82 | 50 | 41 | 82.00 | 50.00 |
| | Bare Ground | 50 | 52 | 50 | 96.15 | 100.00 |
| | Herbaceous Shrub | 37 | 49 | 21 | 42.86 | 56.76 |
| | Grassland | 34 | 49 | 15 | 30.61 | 44.12 |
| | Woody Vegetation | 26 | 51 | 18 | 35.29 | 69.23 |
| | Totals: | 302 | 302 | 32 | | |
| Overall Classification Accuracy: 63.91% | | | | | | |
| Kappa Coefficient: 0.562 | | | | | | |
| 2019 (3) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Cholla | 43 | 51 | 35 | 68.63 | 81.40 |
| | Yucca | 63 | 51 | 36 | 70.59 | 57.14 |
| | Bare Ground | 48 | 51 | 48 | 94.12 | 100.00 |
| | Herbaceous Shrub | 50 | 51 | 37 | 72.55 | 74.00 |
| | Grassland | 66 | 51 | 37 | 72.55 | 56.06 |
| | Woody Vegetation | 36 | 51 | 32 | 62.75 | 88.89 |
| | Totals: | 306 | 306 | 38 | | |
| Overall Classification Accuracy: 73.53% | | | | | | |
| Kappa Coefficient: 0.643 | | | | | | |
| 2020 (1) | | | | | | |
| | Cholla | 43 | 51 | 21 | 41.18 | 48.84 |
| | Yucca | 44 | 50 | 25 | 50.00 | 56.82 |
| | Bare Ground | 44 | 51 | 44 | 86.27 | 100.00 |
| | Herbaceous Shrub | 29 | 49 | 18 | 36.73 | 62.07 |
| | Grassland | 76 | 51 | 20 | 39.22 | 26.32 |
| | Woody Vegetation | 65 | 49 | 44 | 89.80 | 67.69 |
| | Totals: | 301 | 301 | 29 | | |
| Overall Classification Accuracy: 57.14% | | | | | | |
| Kappa Coefficient: 0.486 | | | | | | |
| 2020 (2) | | | | | | |
| | Succulents/Grassland | 183 | 171 | 137 | 80.12 | 74.86 |
| | Bare Ground | 32 | 50 | 28 | 56.00 | 87.50 |
| | Herbaceous Shrub | 45 | 50 | 23 | 46.00 | 51.11 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Woody Vegetation | 65 | 52 | 33 | 63.46 | 50.77 |
| | Structures | 47 | 49 | 32 | 65.31 | 68.09 |
| | Totals: | 372 | 372 | 51 | | |
| Overall Classification Accuracy: 68.01%<br>Kappa Coefficient: 0.546 | | | | | | |
| 2020 (3) | | | | | | |
| | Cholla | 59 | 54 | 26 | 48.15 | 44.07 |
| | Yucca | 63 | 53 | 39 | 73.58 | 61.90 |
| | Bare Ground | 48 | 51 | 48 | 94.12 | 100.00 |
| | Herbaceous Shrub | 9 | 51 | 6 | 11.76 | 66.67 |
| | Grassland | 119 | 88 | 61 | 69.32 | 51.26 |
| | Woody Vegetation | 54 | 55 | 38 | 69.09 | 70.37 |
| | Totals: | 352 | 352 | 36 | | |
| Overall Classification Accuracy: 72.43%<br>Kappa Coefficient: 0.533 | | | | | | |
| 2020 (4) | | | | | | |
| | Cholla | 30 | 51 | 12 | 23.53 | 40.00 |
| | Yucca | 69 | 50 | 39 | 78.00 | 56.52 |
| | Bare Ground | 47 | 50 | 47 | 94.00 | 100.00 |
| | Herbaceous Shrub | 28 | 49 | 8 | 16.33 | 28.57 |
| | Grassland | 68 | 53 | 25 | 47.17 | 36.76 |
| | Woody Vegetation | 61 | 50 | 40 | 80.00 | 65.57 |
| | Totals: | 303 | 303 | 29 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Overall Classification Accuracy: 56.44% | | | | | | |
| Kappa Coefficient: 0.477 | | | | | | |
| 2020 (5) | | | | | | |
| | Succulents/Grassland | 120 | 101 | 81 | 80.20 | 67.50 |
| | Bare Ground | 45 | 50 | 45 | 90.00 | 100.00 |
| | Herbaceous Shrub | 40 | 50 | 22 | 44.00 | 55.00 |
| | Woody Vegetation | 46 | 50 | 38 | 76.00 | 82.61 |
| | Totals: | 251 | 251 | 47 | | |
| Overall Classification Accuracy: 74.1% | | | | | | |
| Kappa Coefficient: 0.632 | | | | | | |

*Table 9. Percent Landscape (PLAND) (%) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Hen Home Ranges (n=17) in the Southern High Plains of Texas*

| Bird ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/ Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 5781 | 3.6301 | 32.5459 | 27.9942 | 0.6842 | | | 1.8432 | 33.3025 |
| 6514 | 4.5081 | 38.7712 | 24.2101 | 0.4722 | | | 1.3777 | 30.6606 |
| 6531 | 19.5595 | 30.3911 | 25.6043 | 1.9399 | | | 1.0876 | 21.4176 |
| 6725 | 22.4018 | 39.03 | 16.5127 | 4.7921 | | | 5.9469 | 11.3164 |
| 6730 | 16.1989 | 40.8613 | 23.3606 | 1.6218 | | | 2.5581 | 15.3992 |
| 6755 | 17.3364 | 44.9292 | 20.8251 | 1.4784 | | | 1.873 | 13.5579 |
| 6762 | 14.7989 | 40.1748 | 24.5157 | 1.1045 | | | 1.5325 | 17.8736 |
| 6764 | 7.4505 | 27.432 | 47.5754 | 3.2857 | | | 1.0199 | 13.2365 |
| 6794 | 9.1071 | 27.5861 | 49.021 | 3.4917 | | | 0.6803 | 10.1139 |
| 7612 | 6.2405 | 19.625 | 63.4145 | 2.6585 | | | 0.5457 | 7.5158 |
| 7616 | 6.6592 | 27.1193 | 44.5526 | 4.1211 | | | 1.583 | 15.9648 |
| 7754 | 3.0994 | 0.0016 | 0.0065 | 12.2538 | | | 1.1182 | 83.5205 |
| 7758 | 9.0156 | 26.3088 | 51.0829 | 4.9418 | | | 0.3879 | 8.2629 |
| 7764 | 9.4982 | 25.5372 | | 9.0826 | | | 0.4865 | 9.8024 |
| 7786 | 14.1024 | 30.5514 | 37.3443 | 1.8992 | | | 0.5758 | 15.5268 |
| 7788 | 10.5325 | | | 5.9726 | 0.7812 | 80.2921 | 2.4217 | |
| 7796 | 13.8377 | 30.7214 | 37.0062 | 1.6806 | | | 0.6863 | 16.0677 |



*Table 10. Class Area (CA) (ha) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Hen Home Ranges (n=17) in the Southern High Plains of Texas*

| Bird | Bare | Cholla | Grasslan | Herbaceous | Structure | Succulents/Grasslan | Woody | Yucca |
|---|---|---|---|---|---|---|---|---|
| 5781 | 0.8118 | 7.2783 | 6.2604 | 0.153 | | | 0.4122 | 7.4475 |
| 6514 | 0.8334 | 7.1676 | 4.4757 | 0.0873 | | | 0.2547 | 5.6682 |
| 6531 | 5.1633 | 8.0226 | 6.759 | 0.5121 | | | 0.2871 | 5.6538 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6725 | 0.6984 | 1.2168 | 0.5148 | 0.1494 | | | 0.1854 | 0.3528 |
| 6730 | 19.5426 | 49.295 | 28.1826 | 1.9566 | | | 3.0861 | 18.577 |
| 6755 | 6.2478 | 16.191 | 7.5051 | 0.5328 | | | 0.675 | 4.8861 |
| 6762 | 9.6471 | 26.189 | 15.9813 | 0.72 | | | 0.999 | 11.651 |
| 6764 | 10.1511 | 37.375 | 64.8198 | 4.4766 | | | 1.3896 | 18.034 |
| 6794 | 5.4459 | 16.496 | 29.3139 | 2.088 | | | 0.4068 | 6.048 |
| 7612 | 2.8098 | 8.8362 | 28.5525 | 1.197 | | | 0.2457 | 3.384 |
| 7616 | 2.9304 | 11.934 | 19.6056 | 1.8135 | | | 0.6966 | 7.0254 |
| 7754 | 1.7262 | 0.0009 | 0.0036 | 6.8247 | | | 0.6228 | 46.516 |
| 7758 | 3.87 | 11.293 | 21.9276 | 2.1213 | | | 0.1665 | 3.5469 |
| 7764 | 7.2207 | 19.413 | | 6.9048 | | | 0.3699 | 7.452 |
| 7786 | 8.7948 | 19.053 | 23.2893 | 1.1844 | | | 0.3591 | 9.6831 |
| 7788 | 13.9428 | | | 7.9065 | 1.0341 | 106.29 | 3.2058 | |
| 7796 | 6.9138 | 15.349 | 18.4896 | 0.8397 | | | 0.3429 | 8.028 |

***Table 11. Largest Patch Index (LPI) (ha) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Hen Home Ranges (n=17) in the Southern High Plains of Texas***

| **Bird ID** | **Bare Ground** | **Cholla** | **Grassland** | **Herbaceous Shrub** | **Structures** | **Succulents/Grassland** | **Woody Veg** | **Yucca** |
|---|---|---|---|---|---|---|---|---|
| 5781 | 0.6117 | 3.8595 | 7.1153 | 0.0201 | | | 0.0523 | 6.1051 |
| 6514 | 0.5696 | 15.822 | 2.7749 | 0.0195 | | | 0.0633 | 5.6667 |
| 6531 | 8.07 | 4.5038 | 8.6086 | 0.0341 | | | 0.0989 | 3.4298 |
| 6725 | 10.4215 | 12.7887 | 1.8187 | 0.2021 | | | 0.3176 | 4.8499 |
| 6730 | 1.0198 | 32.0271 | 7.3512 | 0.0291 | | | 0.132 | 0.4804 |
| 6755 | 2.5822 | 37.2774 | 4.1405 | 0.0474 | | | 0.03 | 0.6168 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6762 | 0.7414 | 31.8289 | 8.0366 | 0.0276 | | | 0.0207 | 0.925 |
| 6764 | 0.5952 | 3.3834 | 27.3415 | 0.0773 | | | 0.0172 | 0.1651 |
| 6794 | 1.1484 | 2.7904 | 41.2685 | 0.1761 | | | 0.0226 | 0.3763 |
| 7612 | 0.4238 | 5.5069 | 61.2877 | 0.062 | | | 0.052 | 0.086 |
| 7616 | 1.7118 | 3.2723 | 23.4543 | 0.2393 | | | 0.0389 | 0.5113 |
| 7754 | 0.328 | 0.0016 | 0.0065 | 0.6545 | | | 0.0259 | 83.3185 |
| 7758 | 2.9793 | 5.5016 | 33.2195 | 1.0043 | | | 0.0168 | 0.4676 |
| 7764 | 3.7718 | 2.7478 | | 2.0931 | | | 0.0213 | 0.7518 |
| 7786 | 7.0599 | 1.9151 | 17.641 | 0.0188 | | | 0.0419 | 1.4518 |
| 7788 | 5.6184 | | | 0.1333 | 0.0394 | 76.4141 | 0.2101 | |
| 7796 | 5.8038 | 1.5473 | 13.3531 | 0.018 | | | 0.0522 | 1.8031 |



*Table 12. Edge Density (ED) (m) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Hen Home Ranges (n=17) in the Southern High Plains of Texas*

| **Bird ID** | **Bare Ground** | **Cholla** | **Grassland** | **Herbaceous Shrub** | **Structures** | **Succulents/Grassland** | **Woody Veg** | **Yucca** |
|---|---|---|---|---|---|---|---|---|
| 5781 | 7.8048 | 0.0193 | 0.0023 | 0.0019 | | | 0.1076 | 0.0027 |
| 6514 | 0.0256 | 0.0275 | 0.0012 | 0.4858 | | | 0.0032 | 0.9335 |
| 6531 | 0.0013 | 0.2095 | 0.7064 | 0.0029 | | | 0.2956 | 0.0409 |
| 6725 | 1668.5912 | 2477.868 | 1579.0993 | 553.3102 | | | 622.5943 | 964.2032 |
| 6730 | 1387.5585 | 2449.458 | 1687.4804 | 181.7535 | | | 279.9785 | 1399.992 |
| 6755 | 1493.3114 | 2575.814 | 1607.6052 | 172.3148 | | | 223.9259 | 1298.1045 |
| 6762 | 1361.2496 | 2479.141 | 1727.115 | 125.1766 | | | 186.3843 | 1589.3747 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6764 | 628.7941 | 2252.029 | 2837.5995 | 356.0238 | | | 121.5224 | 1338.6839 |
| 6794 | 766.1203 | 2263.494 | 2892.3037 | 359.4058 | | | 82.6774 | 1055.4912 |
| 7612 | 609.5253 | 1625.29 | 2415.9804 | 310.5594 | | | 64.9636 | 818.6749 |
| 7616 | 565.702 | 2248.083 | 2843.0992 | 427.1739 | | | 188.3628 | 1558.7824 |
| 7754 | 0.0197 | 0.0011 | 1.1609 | 0.2016 | | | 0.002 | 1.3444 |
| 7758 | 0.0015 | 0.3345 | 1.1735 | 0.004 | | | 46.2918 | 0.2249 |
| 7764 | 0.0036 | 0.0333 | | 0.0031 | | | 0.0331 | 0.043 |
| 7786 | 0.1444 | 0.5691 | 4.3285 | 0.0014 | | | 6.2324 | 0.3247 |
| 7788 | 0.1528 | | | 0.001 | 0.0031 | 0.0799 | 1.0813 | |
| 7796 | 4.2931 | 0.0015 | 0.3626 | 0.0147 | | | 15.5455 | 0.2279 |

***Table 13. Percent Landscape (PLAND) (%) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Hen Home Ranges (n=50) in the Southern High Plains of Texas***

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 11.1161 | 9.8623 | 66.7471 | 1.481 | | | 2.1374 | 8.6561 |
| 2 | 5.7456 | 24.0766 | 58.4051 | 2.8004 | | | 0.7524 | 8.22 |
| 3 | 6.7184 | 25.0962 | 57.0782 | 4.3175 | | | 0.317 | 6.4726 |
| 4 | 6.1824 | 21.2109 | 62.6619 | 2.7159 | | | 0.3457 | 6.8832 |
| 5 | 10.3915 | 10.3494 | 68.0611 | 1.3672 | | | 1.7245 | 8.1063 |
| 6 | 14.1381 | 13.3816 | 60.9393 | 1.0485 | | | 1.7898 | 8.7027 |
| 7 | 7.4312 | 14.6729 | 66.6012 | 2.0454 | | | 1.1553 | 8.094 |
| 8 | 7.2375 | 12.2995 | 70.8241 | 1.5248 | | | 1.0614 | 7.0526 |
| 9 | 6.7213 | 24.9397 | 53.7784 | 2.2737 | | | 1.592 | 10.695 |
| 10 | 13.498 | 48.2072 | 15.5618 | 1.3864 | | | 1.9188 | 19.4278 |
| 11 | 15.1583 | 43.7636 | 20.2418 | 1.1641 | | | 1.6113 | 18.061 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12 | 17.6326 | 24.4254 | 42.8941 | 0.9971 | | 1.9404 | 12.1104 |
| 13 | 15.6582 | 42.4972 | 22.2012 | 0.9491 | | 1.3794 | 17.3149 |
| 14 | 13.5766 | 40.0974 | 22.0629 | 2.02 | | 3.3117 | 18.9314 |
| 15 | 18.7963 | 33.4438 | 32.6888 | 0.5822 | | 1.1194 | 13.3695 |
| 16 | 12.7554 | 50.558 | 12.4803 | 1.9161 | | 2.5175 | 19.7727 |
| 17 | 18.7052 | 44.7995 | 15.5521 | 3.8127 | | 4.9947 | 12.1359 |
| 18 | 16.6907 | 40.1714 | 25.3178 | 0.58 | | 1.0512 | 16.1888 |
| 19 | 6.7577 | 26.7421 | 43.7962 | 4.618 | | 1.5196 | 16.5665 |
| 20 | 5.8998 | 22.9093 | 47.6527 | 3.1852 | | 2.6699 | 17.6831 |
| 21 | 9.8439 | 24.9897 | 54.0366 | 2.5822 | | 0.8252 | 7.7225 |
| 22 | 9.5444 | 27.0399 | 52.3745 | 2.415 | | 0.3896 | 8.2366 |
| 23 | 6.2128 | 31.4589 | 46.6592 | 2.3579 | | 0.5895 | 12.7217 |
| 24 | 4.5915 | 34.3781 | 43.2762 | 2.8026 | | 0.4578 | 14.4939 |
| 25 | 9.2499 | 29.4628 | 46.7676 | 4.0109 | | 0.7478 | 9.761 |
| 26 | 5.1655 | | | 13.2928 | 79.4173 | 2.1244 | |
| 27 | 6.1766 | | | 4.4322 | 88.6299 | 0.7613 | |
| 28 | 4.3947 | | | 5.0787 | 87.2023 | 3.3243 | |
| 29 | 10.5988 | | | 8.7053 | 79.2315 | 1.4644 | |
| 30 | 4.3852 | | | 1.6083 | 91.0022 | 3.0044 | |
| 31 | 2.509 | | | 9.838 | 86.4301 | 1.2231 | |
| 32 | 4.7552 | | | 15.2092 | 79.5998 | 0.4359 | |
| 33 | 3.5085 | | | 7.9201 | 87.7658 | 0.8055 | |
| 34 | 5.173 | | | 14.0552 | 78.9893 | 1.7823 | |
| 35 | 2.1022 | | | 10.6487 | 86.0329 | 1.2162 | |
| 36 | 15.3489 | | | 2.9321 | 77.6121 | 4.1069 | |
| 37 | 9.2069 | | | 4.846 | 83.9047 | 2.0424 | |
| 38 | 29.5526 | | | 1.2082 | 61.6691 | 7.5701 | |
| 39 | 5.5254 | | | 6.889 | 86.2802 | 1.3054 | |
| 40 | 25.2238 | | | 1.1353 | 67.1366 | 6.5044 | |

| | | | | | |
|---|---|---|---|---|---|
| 41 | 11.095 | 7.458 | | 81.1088 | 0.3382 |
| 42 | 16.3771 | 11.1939 | | 71.9138 | 0.5151 |
| 43 | 12.6444 | 10.1694 | | 76.1527 | 1.0334 |
| 44 | 4.919 | 9.7122 | | 83.3598 | 2.009 |
| 45 | 4.1771 | 9.9452 | | 84.085 | 1.7926 |
| 46 | 10.326 | 3.7856 | | 85.4048 | 0.4838 |
| 47 | 15.0679 | 2.1784 | | 82.1117 | 0.6419 |
| 48 | 17.1835 | 9.3513 | 0.2307 | 73.0738 | 0.1606 |
| 49 | 9.9965 | 1.7002 | | 87.7048 | 0.5986 |
| 50 | 9.6295 | 1.3563 | | 88.4791 | 0.5351 |

***Table 14. Class Area (CA) (ha) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Hen Home Ranges (n=50) in the Southern High Plains of Texas***

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 3.5667 | 3.1644 | 21.4164 | 0.4752 | | | 0.6858 | 2.7774 |
| 2 | 1.2852 | 5.3856 | 13.0644 | 0.6264 | | | 0.1683 | 1.8387 |
| 3 | 1.6974 | 6.3405 | 14.4207 | 1.0908 | | | 0.0801 | 1.6353 |
| 4 | 2.3499 | 8.0622 | 23.8176 | 1.0323 | | | 0.1314 | 2.6163 |
| 5 | 3.7692 | 3.7539 | 24.687 | 0.4959 | | | 0.6255 | 2.9403 |
| 6 | 5.0121 | 4.7439 | 21.6036 | 0.3717 | | | 0.6345 | 3.0852 |
| 7 | 2.8251 | 5.5782 | 25.3197 | 0.7776 | | | 0.4392 | 3.0771 |
| 8 | 2.7126 | 4.6098 | 26.5446 | 0.5715 | | | 0.3978 | 2.6433 |
| 9 | 1.4553 | 5.4 | 11.6442 | 0.4923 | | | 0.3447 | 2.3157 |
| 10 | 3.8556 | 13.77 | 4.4451 | 0.396 | | | 0.5481 | 5.5494 |
| 11 | 5.4612 | 15.7671 | 7.2927 | 0.4194 | | | 0.5805 | 6.507 |
| 12 | 6.2073 | 8.5986 | 15.1002 | 0.351 | | | 0.6831 | 4.2633 |
| 13 | 5.895 | 15.9993 | 8.3583 | 0.3573 | | | 0.5193 | 6.5187 |
| 14 | 3.1878 | 9.4149 | 5.1804 | 0.4743 | | | 0.7776 | 4.4451 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 7.1478 | 12.7179 | 12.4308 | 0.2214 | | 0.4257 | 5.0841 |
| 16 | 2.2527 | 8.9289 | 2.2041 | 0.3384 | | 0.4446 | 3.492 |
| 17 | 4.4154 | 10.575 | 3.6711 | 0.9 | | 1.179 | 2.8647 |
| 18 | 6.345 | 15.2712 | 9.6246 | 0.2205 | | 0.3996 | 6.1542 |
| 19 | 2.5695 | 10.1682 | 16.6527 | 1.7559 | | 0.5778 | 6.2991 |
| 20 | 1.3086 | 5.0814 | 10.5696 | 0.7065 | | 0.5922 | 3.9222 |
| 21 | 2.5767 | 6.5412 | 14.1444 | 0.6759 | | 0.216 | 2.0214 |
| 22 | 2.2266 | 6.3081 | 12.2184 | 0.5634 | | 0.0909 | 1.9215 |
| 23 | 2.0394 | 10.3266 | 15.3162 | 0.774 | | 0.1935 | 4.176 |
| 24 | 0.8847 | 6.624 | 8.3385 | 0.54 | | 0.0882 | 2.7927 |
| 25 | 3.5181 | 11.2059 | 17.7876 | 1.5255 | | 0.2844 | 3.7125 |
| 26 | 1.8207 | | | 4.6854 | 27.9927 | 0.7488 | |
| 27 | 2.9574 | | | 2.1222 | 42.4368 | 0.3645 | |
| 28 | 1.116 | | | 1.2897 | 22.1445 | 0.8442 | |
| 29 | 5.1786 | | | 4.2534 | 38.7126 | 0.7155 | |
| 30 | 1.5435 | | | 0.5661 | 32.031 | 1.0575 | |
| 31 | 1.2204 | | | 4.7853 | 42.0408 | 0.5949 | |
| 32 | 1.728 | | | 5.5269 | 28.926 | 0.1584 | |
| 33 | 0.9369 | | | 2.115 | 23.4369 | 0.2151 | |
| 34 | 1.9017 | | | 5.1669 | 29.0376 | 0.6552 | |
| 35 | 0.9738 | | | 4.9329 | 39.8538 | 0.5634 | |
| 36 | 7.4673 | | | 1.4265 | 37.7586 | 1.998 | |
| 37 | 3.3309 | | | 1.7532 | 30.3552 | 0.7389 | |
| 38 | 11.1834 | | | 0.4572 | 23.337 | 2.8647 | |
| 39 | 2.6514 | | | 3.3057 | 41.4018 | 0.6264 | |
| 40 | 11.1582 | | | 0.5022 | 29.6991 | 2.8773 | |
| 41 | 5.049 | | | 3.3939 | 36.9099 | 0.1539 | |
| 42 | 7.3539 | | | 5.0265 | 32.292 | 0.2313 | |
| 43 | 6.0786 | | | 4.8888 | 36.6093 | 0.4968 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 44 | 2.3931 | | | 4.725 | | 40.5549 | 0.9774 | |
| 45 | 2.0322 | | | 4.8384 | | 40.9077 | 0.8721 | |
| 46 | 4.8411 | | | 1.7748 | | 40.0401 | 0.2268 | |
| 47 | 6.0633 | | | 0.8766 | | 33.0417 | 0.2583 | |
| 48 | 8.3781 | | | 4.5594 | 0.1125 | 35.6283 | 0.0783 | |
| 49 | 4.8843 | | | 0.8307 | | 42.8526 | 0.2925 | |
| 50 | 4.6647 | | | 0.657 | | 42.8607 | 0.2592 | |

***Table 15. Largest Patch Index (LPI) (ha) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Hen Home Ranges (n=50) in the Southern High Plains of Texas***

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 2.7853 | 0.6115 | 66.0599 | 0.0393 | | | 0.1515 | 0.2749 |
| 2 | 0.684 | 8.5419 | 53.605 | 0.1972 | | | 0.0403 | 0.5512 |
| 3 | 0.4524 | 7.4879 | 54.0895 | 0.0855 | | | 0.0321 | 0.1888 |
| 4 | 0.2202 | 6.9874 | 60.1875 | 0.0568 | | | 0.0071 | 0.0758 |
| 5 | 2.4639 | 0.5409 | 67.4557 | 0.0348 | | | 0.1315 | 0.2432 |
| 6 | 2.3839 | 2.2239 | 48.3777 | 0.0407 | | | 0.1422 | 0.3478 |
| 7 | 0.5895 | 0.9919 | 65.6069 | 0.0781 | | | 0.0616 | 0.1231 |
| 8 | 1.0013 | 1.0061 | 70.3054 | 0.012 | | | 0.0408 | 0.1249 |
| 9 | 0.7066 | 5.0545 | 49.576 | 0.2203 | | | 0.0914 | 0.9851 |
| 10 | 0.8633 | 43.9568 | 0.8224 | 0.063 | | | 0.0441 | 1.6951 |
| 11 | 0.6845 | 38.4802 | 5.126 | 0.05 | | | 0.02 | 1.344 |
| 12 | 1.7922 | 5.471 | 33.4092 | 0.0972 | | | 0.1482 | 0.4423 |
| 13 | 0.8726 | 35.9016 | 8.1542 | 0.0478 | | | 0.0143 | 1.2813 |
| 14 | 1.514 | 21.7103 | 7.8654 | 0.0767 | | | 0.5136 | 2.664 |
| 15 | 1.6307 | 16.2379 | 20.8056 | 0.0615 | | | 0.0142 | 0.471 |
| 16 | 1.2689 | 46.3283 | 0.9071 | 0.1019 | | | 0.0713 | 2.7417 |
| 17 | 5.0252 | 18.831 | 1.6814 | 0.0915 | | | 0.366 | 0.9646 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18 | 1.2287 | 32.0865 | 6.5177 | 0.0473 | | 0.0142 | 1.3755 |
| 19 | 1.6735 | 3.0321 | 24.1479 | 0.2769 | | 0.045 | 0.5917 |
| 20 | 0.5802 | 2.2642 | 39.8742 | 0.1096 | | 0.0771 | 0.4991 |
| 21 | 1.0143 | 2.4825 | 49.6115 | 0.086 | | 0.0894 | 0.2751 |
| 22 | 1.4969 | 3.9929 | 49.7319 | 0.3086 | | 0.0077 | 0.1273 |
| 23 | 0.913 | 12.2721 | 30.9681 | 0.0685 | | 0.0247 | 0.3482 |
| 24 | 0.383 | 12.3733 | 28.9972 | 0.0701 | | 0.0234 | 0.4204 |
| 25 | 1.6611 | 4.3871 | 37.9839 | 0.213 | | 0.0355 | 0.5868 |
| 26 | 2.9875 | | | 0.7941 | 35.9744 | 0.1329 | |
| 27 | 2.2048 | | | 0.2538 | 42.3 | 0.0319 | |
| 28 | 3.1436 | | | 1.1022 | 25.8506 | 0.1772 | |
| 29 | 2.9951 | | | 0.3702 | 19.2249 | 0.0607 | |
| 30 | 1.5265 | | | 0.179 | 13.8868 | 0.0972 | |
| 31 | 0.6032 | | | 0.2147 | 81.5065 | 0.0389 | |
| 32 | 0.7727 | | | 1.003 | 78.624 | 0.0149 | |
| 33 | 1.156 | | | 0.4045 | 84.7932 | 0.0842 | |
| 34 | 2.906 | | | 0.7614 | 38.8508 | 0.098 | |
| 35 | 0.1807 | | | 0.2292 | 85.009 | 0.0505 | |
| 36 | 9.5142 | | | 0.2349 | 76.0545 | 0.6104 | |
| 37 | 4.5127 | | | 0.2985 | 83.5862 | 0.1393 | |
| 38 | 21.6757 | | | 0.0809 | 45.0543 | 0.8966 | |
| 39 | 2.155 | | | 0.2345 | 86.0907 | 0.0751 | |
| 40 | 16.0522 | | | 0.0692 | 46.696 | 0.3459 | |
| 41 | 3.643 | | | 1.0165 | 41.9655 | 0.0258 | |
| 42 | 5.9767 | | | 0.7516 | 26.1419 | 0.0361 | |
| 43 | 3.044 | | | 0.3763 | 19.5527 | 0.0413 | |
| 44 | 1.9147 | | | 0.4477 | 44.9312 | 0.1146 | |
| 45 | 0.8047 | | | 0.4477 | 55.4888 | 0.1072 | |
| 46 | 3.5187 | | | 0.6757 | 41.8567 | 0.0096 | |
| 47 | 6.4011 | | | 0.1633 | 26.309 | 0.0649 | |

| | | | | | |
|---|---|---|---|---|---|
| 48 | 6.1081 | 1.8533 | 0.0074 | 26.3615 | 0.0037 |
| 49 | 4.2311 | 0.035 | | 30.0742 | 0.0534 |
| 50 | 3.2439 | 0.0149 | | 24.7863 | 0.0539 |

***Table 16. Edge Density (ED) (m) Metric from Fragstats Analysis of Classified Random Scaled Quail (*Callipepla squamata*) Hen Home Ranges (n=50) in the Southern High Plains of Texas***

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 929.3802 | 977.0647 | 2412.181 | 178.2091 | | | 250.4839 | 917.2253 |
| 2 | 569.8613 | 1788.445 | 2430.461 | 326.5739 | | | 88.3828 | 854.0543 |
| 3 | 604.1607 | 1870.785 | 2406.55 | 503.111 | | | 38.1163 | 697.9671 |
| 4 | 615.8691 | 1702.776 | 2409.175 | 322.102 | | | 44.515 | 767.6462 |
| 5 | 875.3081 | 1014.59 | 2378.873 | 165.2524 | | | 201.5615 | 866.8718 |
| 6 | 1155.708 | 1122.958 | 2427.689 | 126.8512 | | | 207.1592 | 883.1345 |
| 7 | 609.834 | 1314.521 | 2317.496 | 245.4961 | | | 130.6787 | 855.3301 |
| 8 | 541.8948 | 1140.14 | 2158.054 | 194.5859 | | | 122.7068 | 772.1801 |
| 9 | 642.7522 | 1750.076 | 2253.166 | 266.0238 | | | 183.7227 | 988.4446 |
| 10 | 1264.1 | 2770.811 | 1403.89 | 153.4438 | | | 228.9579 | 1672.233 |
| 11 | 1381.263 | 2609.811 | 1590.351 | 126.6518 | | | 198.0965 | 1623.492 |
| 12 | 1512.378 | 1778.261 | 2364.396 | 113.2558 | | | 225.915 | 1176.275 |
| 13 | 1414.501 | 2545.879 | 1675.87 | 103.3524 | | | 172.7586 | 1574.271 |
| 14 | 1167.159 | 2423.371 | 1559.406 | 225.3823 | | | 344.5897 | 1530.913 |
| 15 | 1650.928 | 2242.523 | 2148.565 | 66.583 | | | 140.1084 | 1304.207 |
| 16 | 1191.119 | 2750.684 | 1227.811 | 207.5795 | | | 297.4401 | 1689.174 |
| 17 | 1423.288 | 2512.709 | 1404.225 | 430.0747 | | | 530.3492 | 1119.16 |
| 18 | 1511.478 | 2498.639 | 1873.466 | 69.9985 | | | 133.1313 | 1490.645 |
| 19 | 578.7256 | 2233.084 | 2838.083 | 475.4466 | | | 178.5489 | 1601.496 |
| 20 | 532.4948 | 2129.032 | 2881.991 | 367.485 | | | 315.6827 | 1769.527 |
| 21 | 812.9327 | 2048.32 | 2728.304 | 282.7442 | | | 91.3446 | 844.4506 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 22 | 792.0219 | 2239.497 | 2916.811 | 254.4912 | | | 50.924 | 896.4418 |
| 23 | 526.234 | 2309.471 | 2684.452 | 272.5304 | | | 70.8286 | 1298.678 |
| 24 | 428.0131 | 2448.503 | 2738.101 | 326.0311 | | | 57.2968 | 1486.135 |
| 25 | 766.4458 | 2349.266 | 2891.623 | 399.1166 | | | 90.5506 | 1028.317 |
| 26 | 363.3439 | | | 1247.745 | | 3740.595 | 241.2079 | |
| 27 | 494.4142 | | | 456.3824 | | 5850.767 | 89.7853 | |
| 28 | 273.0129 | | | 472.6633 | | 5823.292 | 380.0444 | |
| 29 | 723.7808 | | | 873.105 | | 5722.768 | 170.7528 | |
| 30 | 373.4008 | | | 175.9186 | | 6581.52 | 329.336 | |
| 31 | 228.2623 | | | 1067.856 | | 1331.705 | 143.1496 | |
| 32 | 394.6141 | | | 1414.254 | | 1766.435 | 53.6609 | |
| 33 | 265.3545 | | | 850.887 | | 1168.369 | 94.8176 | |
| 34 | 371.2318 | | | 1330.036 | | 3301.751 | 203.5287 | |
| 35 | 215.3316 | | | 1128.467 | | 1387.254 | 140.9856 | |
| 36 | 863.1789 | | | 297.0993 | | 1329.732 | 385.8961 | |
| 37 | 668.4412 | | | 506.4929 | | 1291.524 | 223.56 | |
| 38 | 1241.23 | | | 132.0744 | | 1578.392 | 660.1342 | |
| 39 | 425.3803 | | | 739.4139 | | 1235.003 | 148.358 | |
| 40 | 1120.877 | | | 125.3255 | | 1433.241 | 582.1398 | |
| 41 | 732.5514 | | | 653.574 | | 5030.82 | 42.0598 | |
| 42 | 979.6298 | | | 1018.981 | | 4995.023 | 61.3313 | |
| 43 | 827.4829 | | | 997.7846 | | 5431.059 | 121.8759 | |
| 44 | 376.7698 | | | 971.3384 | | 4755.007 | 226.8635 | |
| 45 | 380.5313 | | | 1029.488 | | 4264.528 | 202.0744 | |
| 46 | 711.2416 | | | 369.7305 | | 5575.584 | 61.9417 | |
| 47 | 1038.745 | | | 239.9857 | | 5838.832 | 74.702 | |
| 48 | 1075.916 | | | 844.501 | 29.7806 | 5000.8 | 20.6126 | |
| 49 | 762.831 | | | 210.8469 | | 5801.605 | 70.9168 | |
| 50 | 763.2902 | | | 171.361 | | 5790.478 | 62.5495 | |

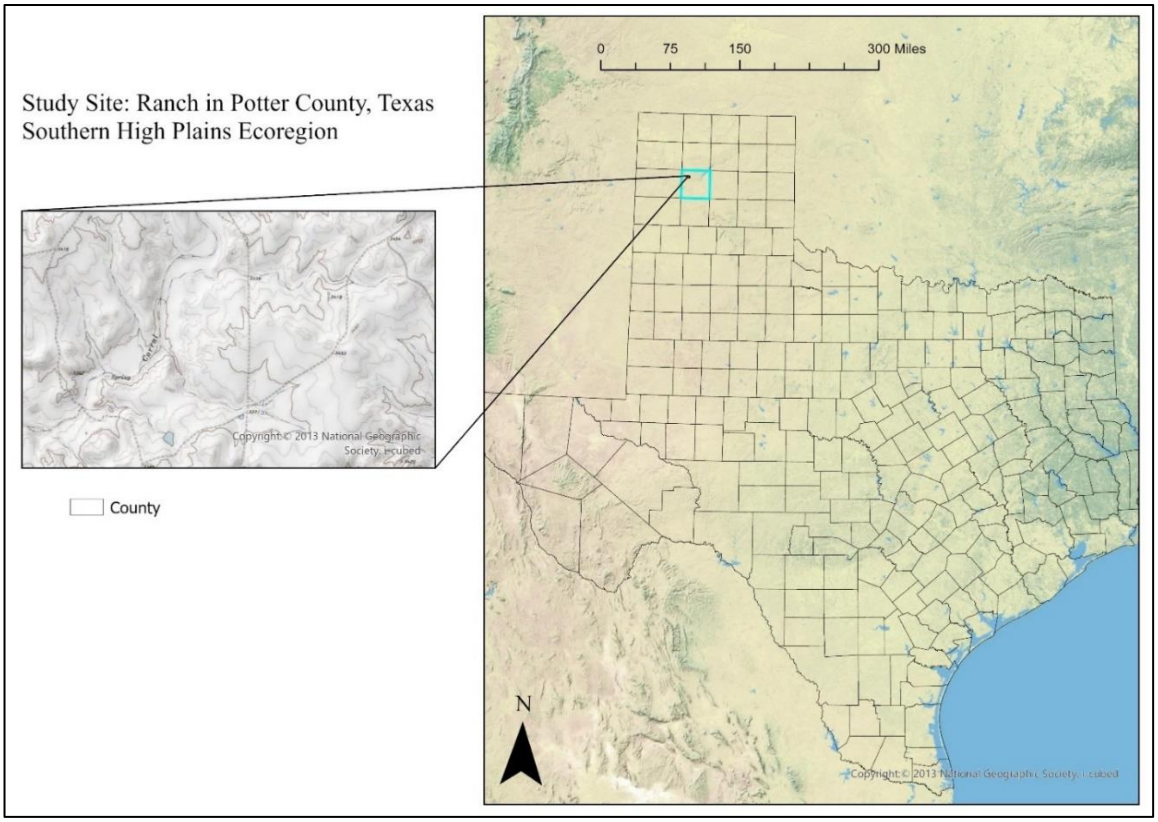


***Figure 1. Map of Study Site in Potter County, Texas, in the Southern High Plains Ecoregion***

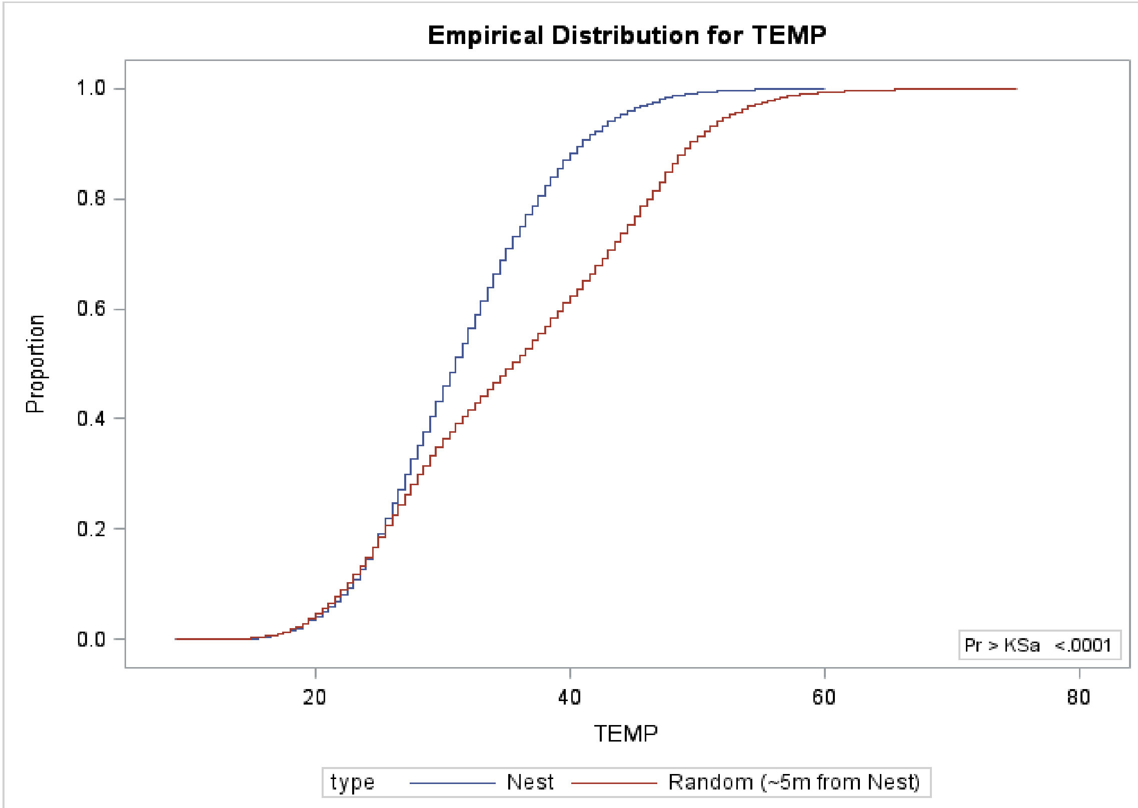


***Figure 2. Empirical Distribution Function of Average Temperature Recordings from Scaled Quail (Callipepla squamata) Nest Sites (blue) (n=39) and Paired Random (red) Sites (April 1 – August 15) from 2019 and 2020 in the Southern High Plains of Texas, 87% of temperature recordings at nest sites versus 61% at random sites occurred to the left of the MD (39.5° C)***

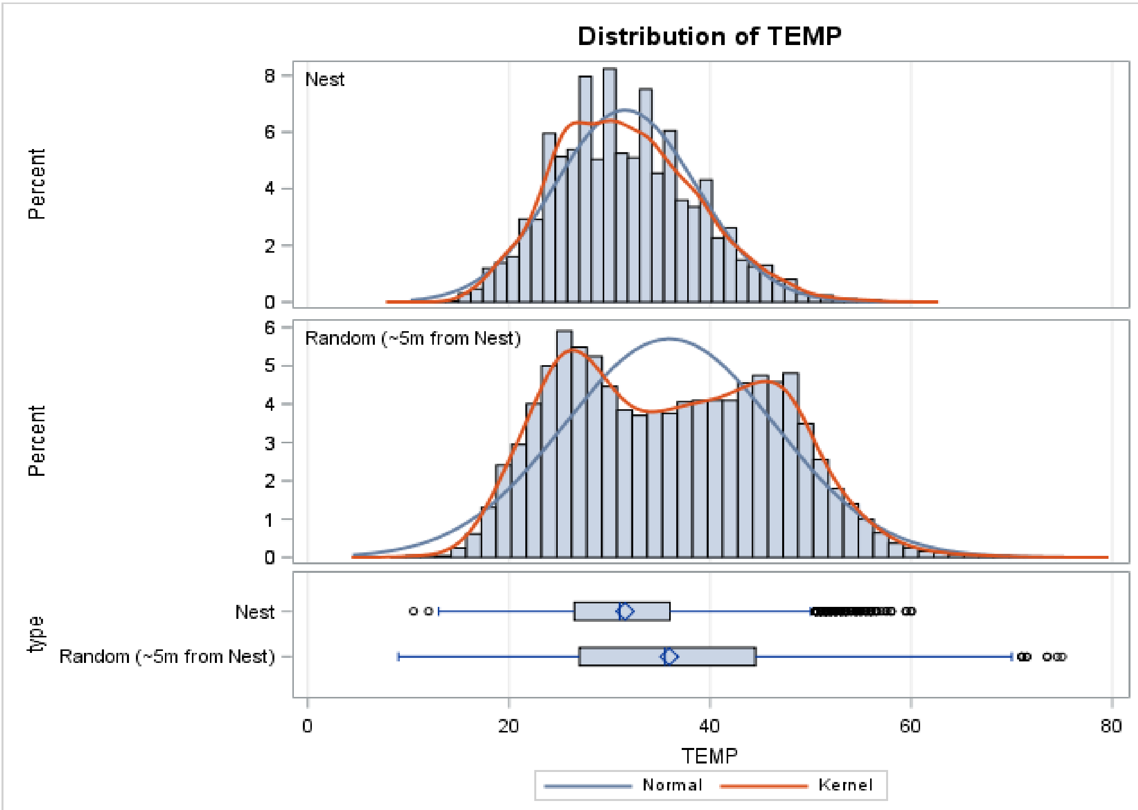


***Figure 3. Histogram of Average Temperature Recordings at Scaled Quail (Callipepla squamata) Nest Sites (n=39) and Paired Random Sites (April 1 – August 15) from 2019 and 2020 in the Southern High Plains of Texas***

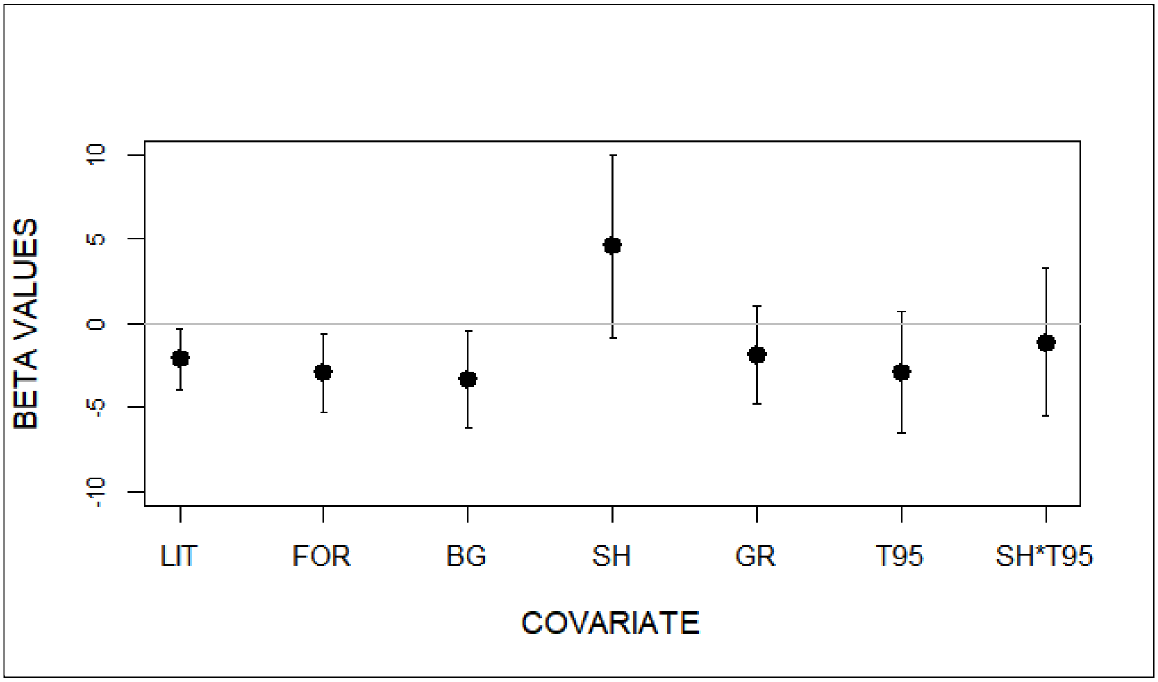


***Figure 4. Plot Illustrating Relationship Among Variables in Top Logistic Regression Model for Scaled Quail (Callipepla squamata) Nest Site Selection (n=39) (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas, LIT = Litter cover, FOR = Forb cover, BG = Bare ground cover, SH = Shrub cover, GR = Grass cover, T95 = Temperatures at nest sites occurring at 95<sup>th</sup> percentile***

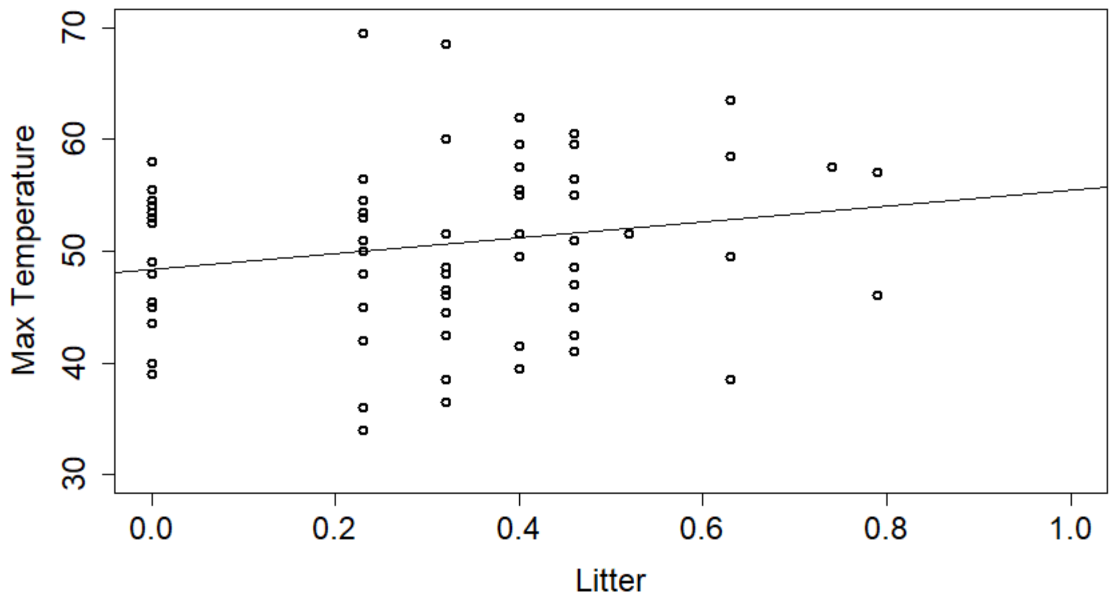


***Figure 5. Plot Illustrating Relationship Between Maximum Temperatures and Litter Cover from Top Logistic Regression Model for Scaled Quail (*Callipepla squamata*) Nest Site selection (n=39) (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas***

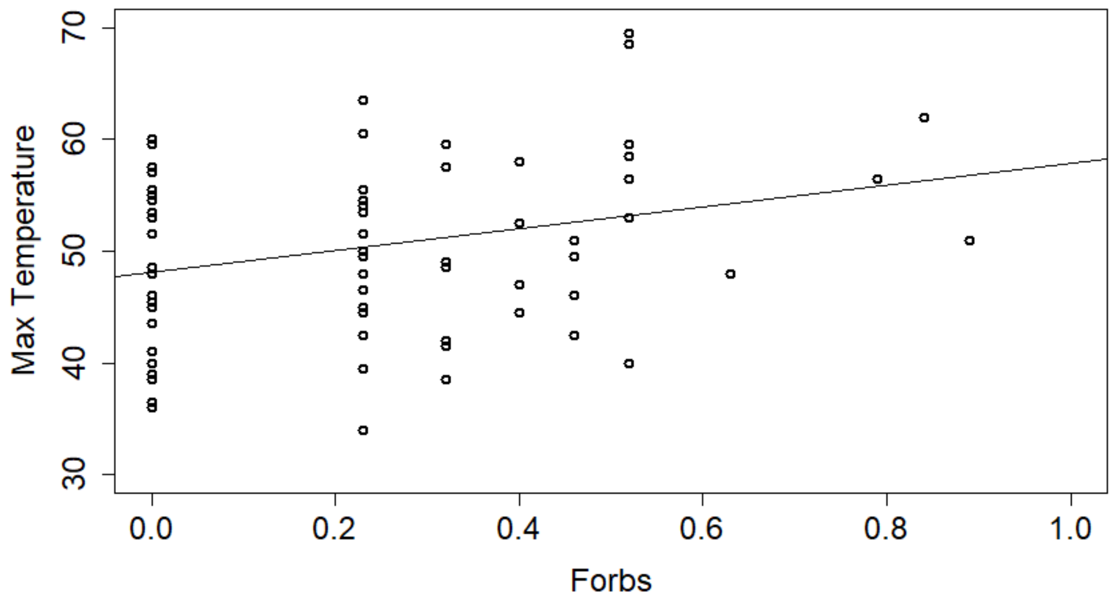


***Figure 6. Plot Illustrating Relationship Between Maximum Temperatures and Forb Cover from Top Logistic Regression Model for Scaled Quail (Callipepla squamata) Nest Site selection (n=39) (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas***

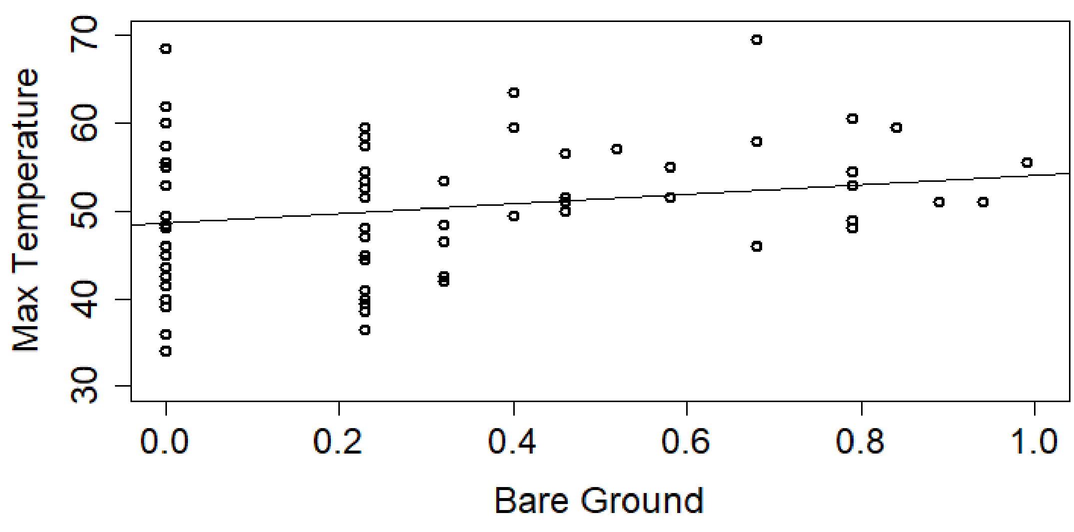


***Figure 7. Plot Illustrating Relationship Between Maximum Temperatures and Amount of Bare Ground from Top Logistic Regression Model for Scaled Quail (Callipepla squamata) Nest Site selection (n=39)***

*(April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas*

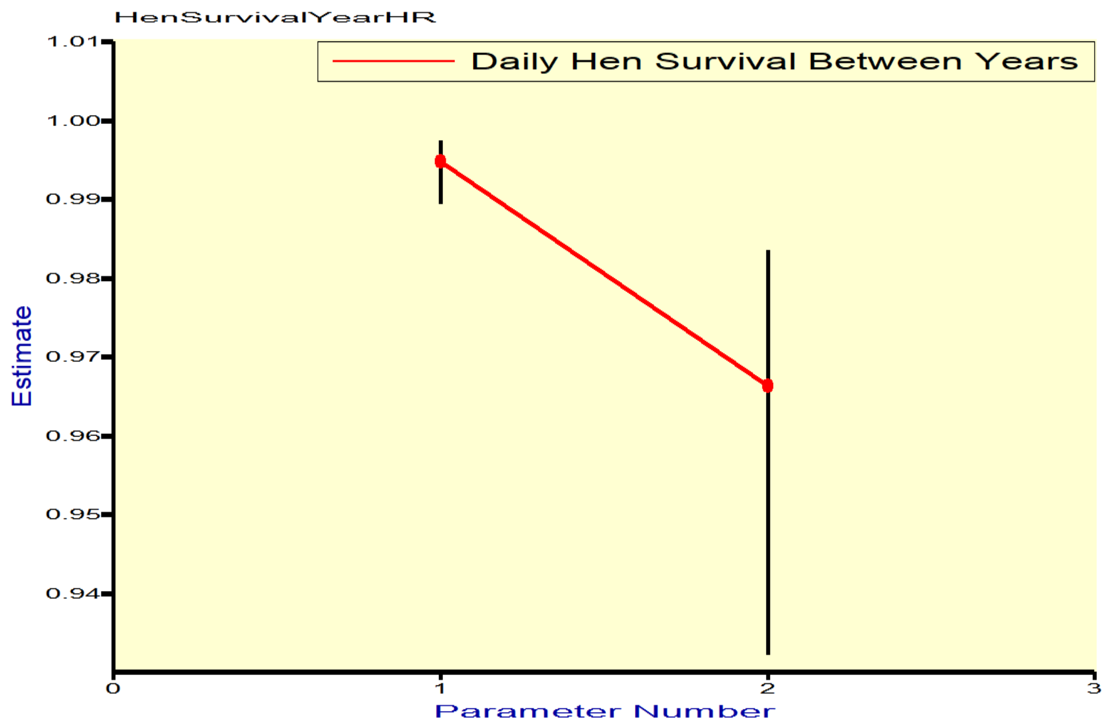


***Figure 8. Daily Survival Estimates of Scaled Quail (Callipepla squamata) Hens (n=37) (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas***

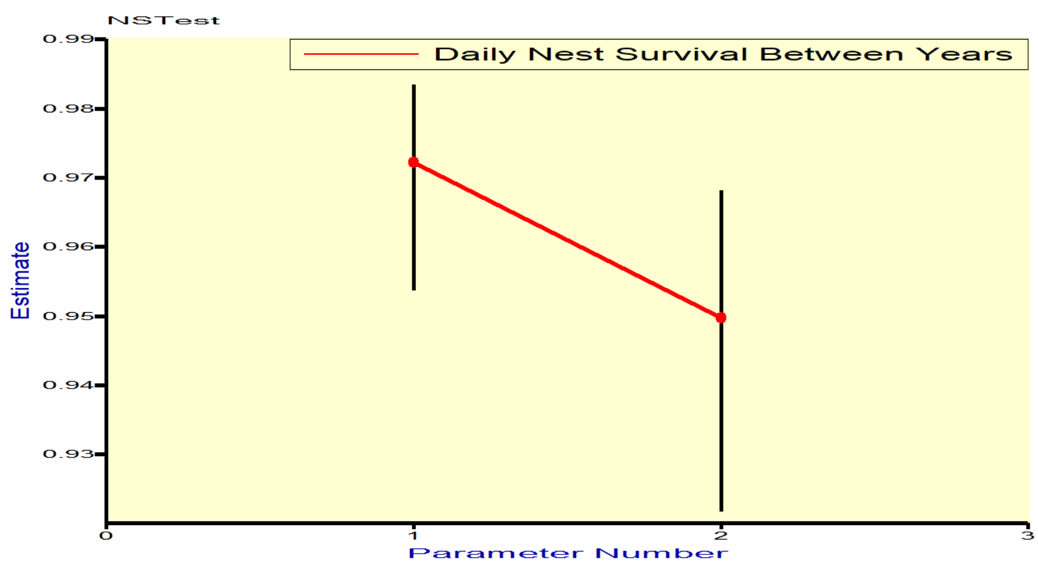


***Figure 9. Daily Survival Estimates of Scaled Quail (Callipepla squamata) Nests (n=38) (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas***

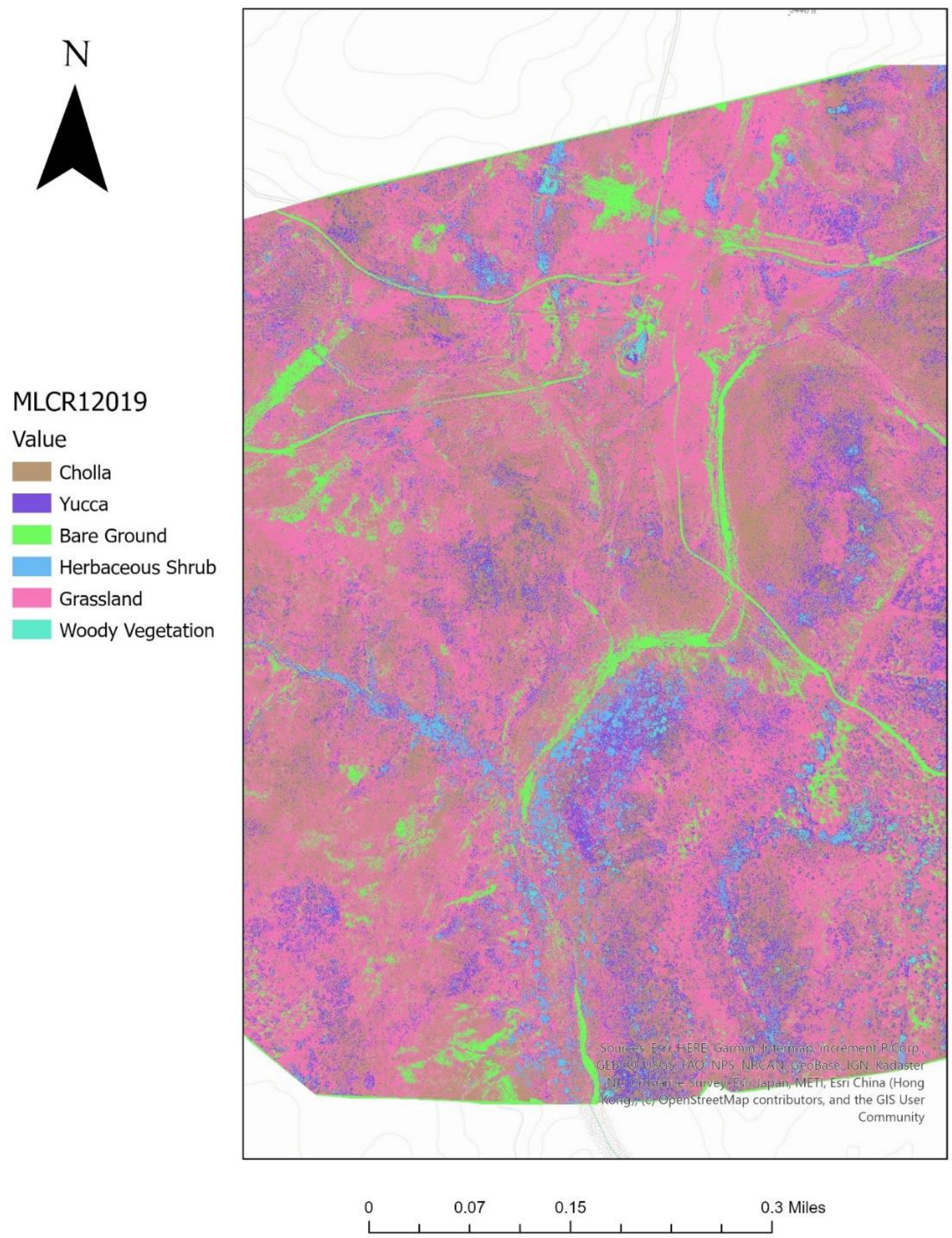


***Figure 10. Maximum Likelihood Classified Raster Image of First 2019 Sensefly Ebee Drone Flight on our Study Site in the Southern High Plains Ecoregion of Texas (before resampling)***

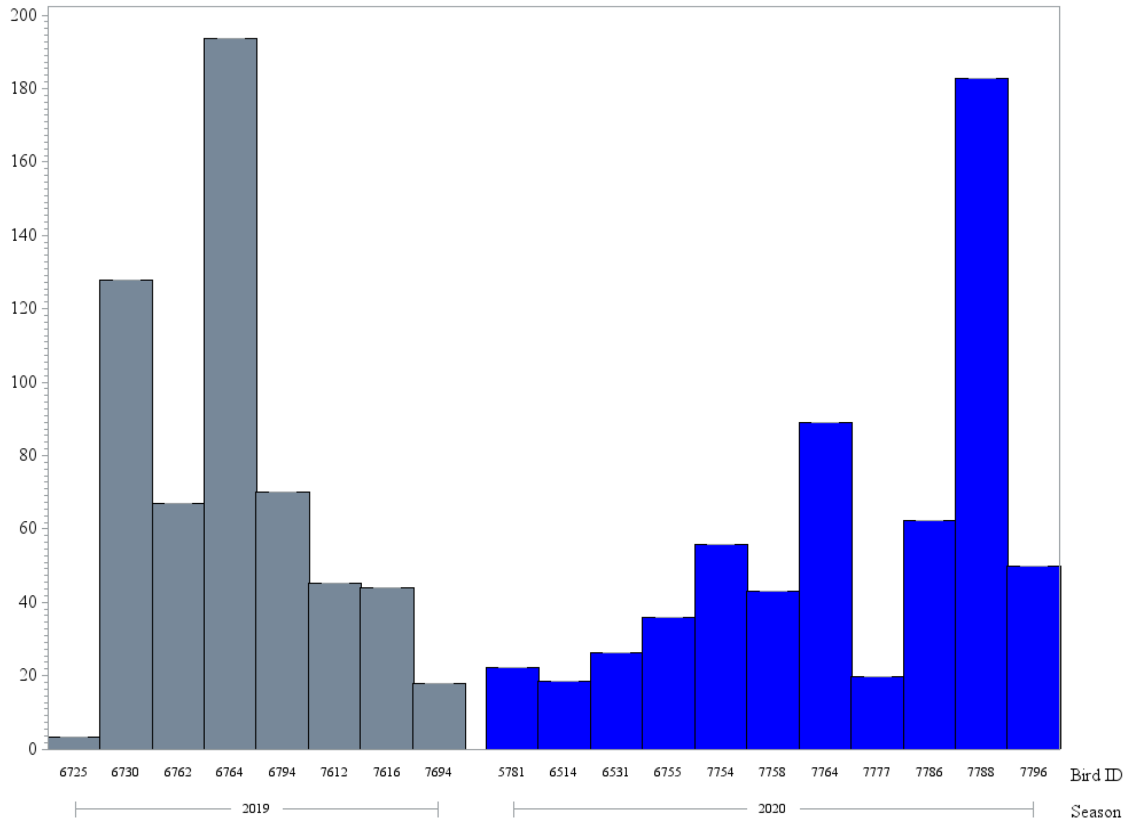


***Figure 11. Bar Plot of Scaled Quail (Callipepla squamata) Hen Home Range (n=19) Sizes (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas, Calculated Using Brownian Bridge Movement Model, (y axis is size in ha and x axis is separated by year and Bird ID)***

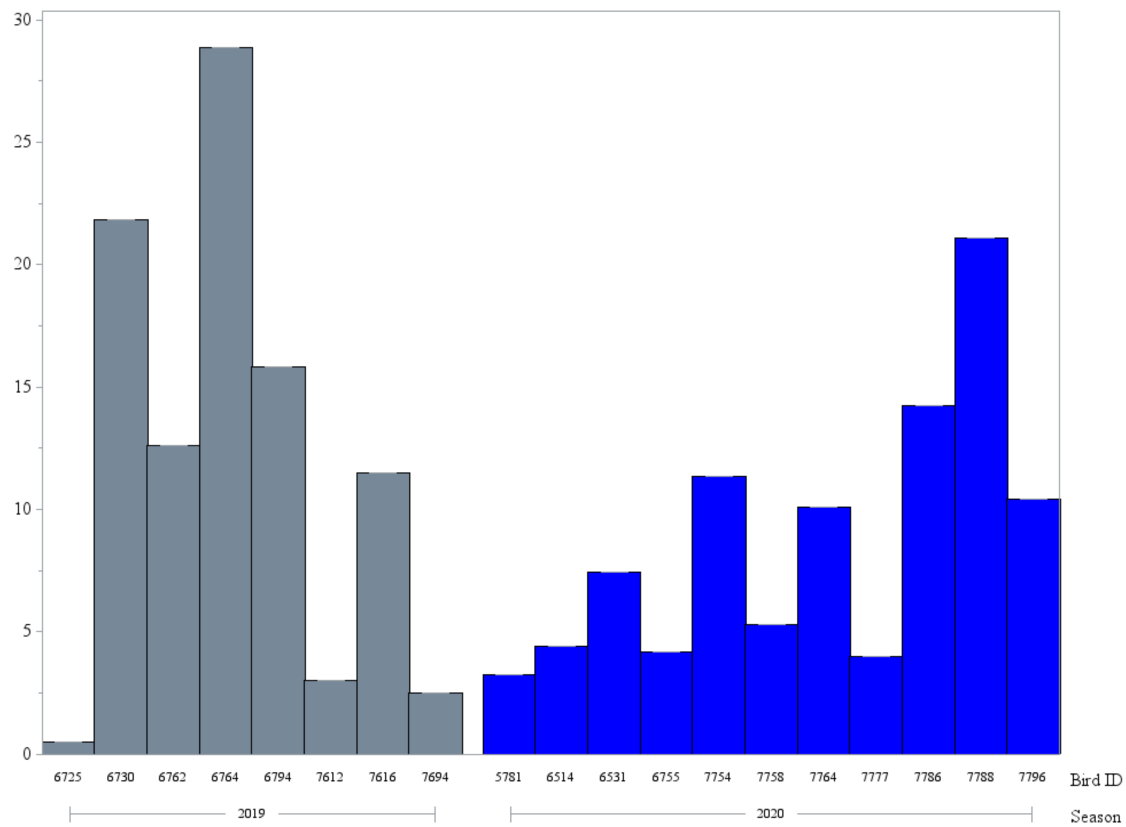


***Figure 12. Bar Plot of Scaled Quail (Callipepla squamata) Hen Core Use Area (n=19) Sizes (April 1 – August 15) 2019 and 2020 in the Southern High Plains of Texas, Calculated Using Brownian Bridge Movement Model, (y axis is size in ha and x axis is separated by year and Bird ID)***

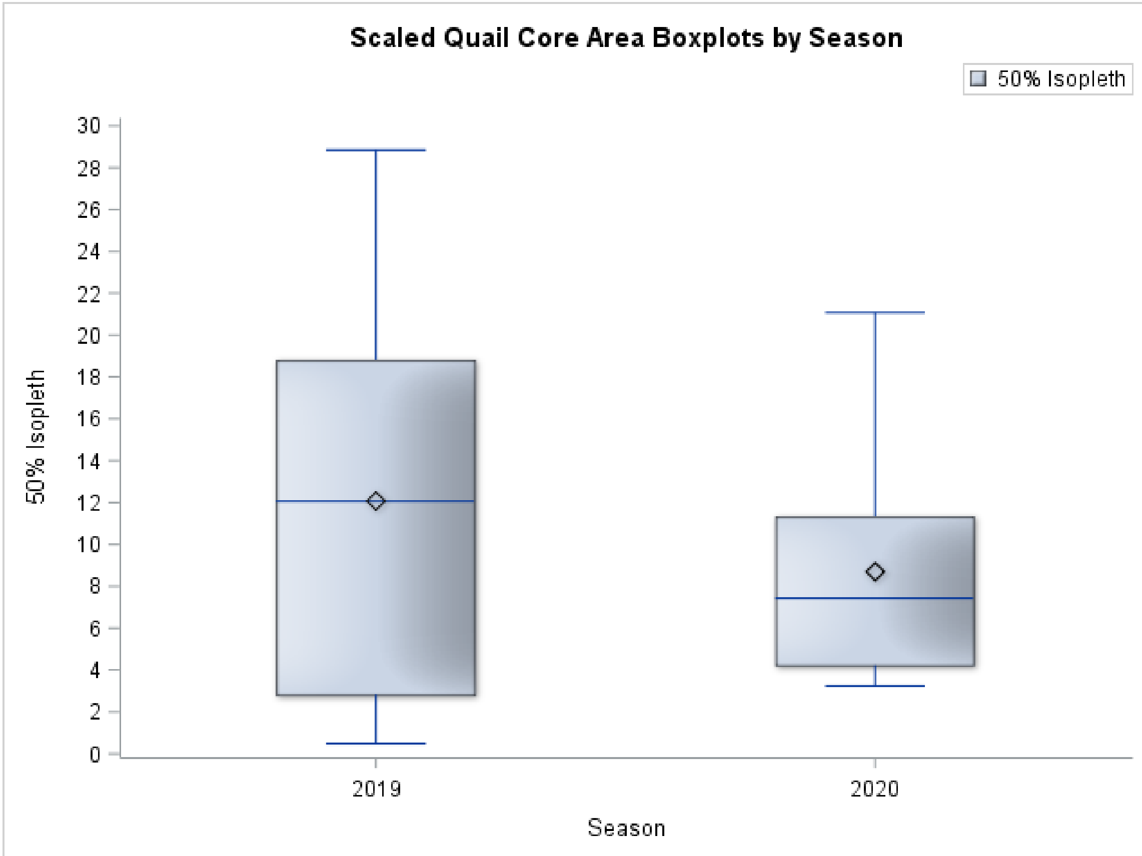


***Figure 13. Boxplots Comparing Mean Sizes of Scaled Quail (Callipepla squamata) Hen Core Use Area (n=19) Sizes (April 1 – August 15) Between 2019 and 2020 in the Southern High Plains of Texas, (y axis is size in ha)***

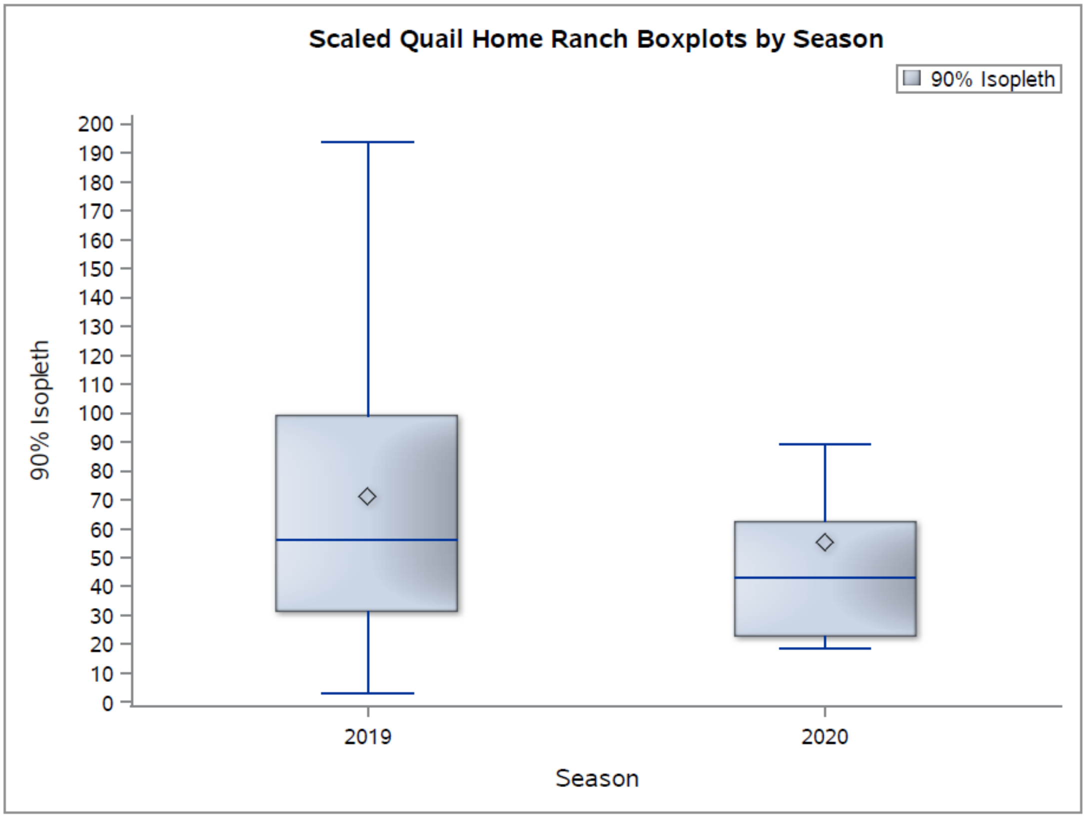


***Figure 14. Boxplots Comparing Mean Sizes of Scaled Quail (Callipepla squamata) Hen Home Ranges (n=19) Sizes (April 1 – August 15) Between 2019 and 2020 in the Southern High Plains of Texas, (y axis is size in ha)***

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# III. BROOD ECOLOGY AND SURVIVAL OF SCALED QUAIL CHICKS IN THE SOUTHERN HIGH PLAINS OF TEXAS

## Abstract

Scaled quail (*Callipepla squamata*) chick ecology and survival are relatively understudied and poorly understood, although their ecology is thought to be largely similar to northern bobwhite (*Colinus virginianus*) chick ecology. Based on long-term roadside call counts performed by Texas Parks and Wildlife (TPWD), scaled quail numbers have been declining since the mid to late 1980's in the Rolling Plains and Southern High Plains of Texas. While there are many factors at play in this decline, as with adults, weather variables such as high temperatures can have extremely negative effects on chicks, especially during their early life-stages. I suspect the changes in the landscape due to invasive woody vegetation encroachment in conjunction with climate change and increasing average temperatures, make understanding the specifics of brood ecology more imperative. The purpose of my study was to add to the limited literature on scaled quail chick ecology in Texas, specifically how they interact with woody vegetation at the microclimate and home range scales. My findings indicated that temperature at the microclimate scale was the most important factor in chick survival (0.95±0.82), and lower average temperatures (-4.68±1.16) and reduced amounts of grass cover (-14.98±4.46) were important for daytime loafing habitat at the microclimate scale. Additionally, less bare ground (-0.11±0.34) and more yucca (0.21±0.07) or succulent species increased the probability that a scaled quail chick would select a location for daytime loafing. I did not calculate any statistical significance regarding woody vegetation usage; however, I did determine that broods selected mesquite (38%) more

frequently than other vegetation types, indicating that the brooding hen potentially selects for more overhead cover for protection against aerial predators.

## Introduction

There is a significant lack of knowledge and research on scaled quail (*Callipepla squamata*) brood ecology as well as specific requirements for chick survival (DeMaso et al. 1997, Pleasant et al. 2006, Orange 2015). Chick survival was estimated between 10–48% in a previous study conducted in the Southern High Plains (SHP) between 1999 and 2000 (Pleasant et al. 2006). Higher survival estimates were calculated in Oklahoma, however, researchers observed a high frequency of hen abandonment where the hen left the brood care to the male, presumably, to initiate a second nest attempt (Orange 2015). Researchers reasoned that this would potentially bias first week survival estimates low, as the males were not VHF tagged and unable to be tracked.

Scaled quail chicks are most vulnerable during early life-stages with survivability increasing significantly after the first few weeks of life (Tharp 1971, Lusk et al. 2005, Orange 2015). Scaled quail are a precocial species, meaning they are mobile within 12 hours after hatching, are able to immediately leave the nest with the hen and begin flying after 2 weeks (Lusk et al. 2005, Orange 2015). During the first ~3 days of life quail chicks are unable to thermoregulate on their own, making them highly susceptible to temperature extremes, after which they begin to develop thermoregulating abilities (Spiers et al. 1974). Bobwhite and scaled quail chicks have similar feather development patterns up until they begin to develop their primary feathers, making the two species comparable during their early life-stages (Wallmo 1956). Chicks initially hatch out with down feathers and begin to develop juvenile plumage quickly (Spiers et al. 1974)

Juvenile plumage will be fully developed at approximately 4 weeks of age, however juvenile remiges are not completely developed until approximately 12 weeks (Wallmo 1956, Spiers et al. 1974). Post juvenile molt begins at approximately 17 weeks and commences between 21 to 22 weeks of age, after which they will have their adult plumage (Wallmo 1956). Scaled quail chicks typically reach adult weight, calculated at an average of 177 grams by Smith and Cain (1984), by approximately 22 weeks of age, with growth rates slowing to approximately 2% after 14 weeks of age.

Threats to survival include extreme weather events, such as higher than average temperatures and drought conditions, cover availability (insufficient vegetation), food availability, and predator abundance (Hurst 1972, Orange 2015, Kauffman et al. 2021). Weather events alone can have significant impacts on chick survival. (Guthery et al. 2000, Carroll et al. 2016). Scaled quail typically experience higher mortality rates when exposed to sustained ambient temperatures of approximately 39° C and higher (Forrester et al. 1998, Guthery et al. 2000, Tri et al. 2013). Belnap et al. (2019) conducted a study on the relationship between the effects of sustained temperatures at or over 38.1° C as well as at or under 36.9° C during incubation and discovered that bobwhite chicks exhibited increased issues with motor skills and more frequent falls when exposed to both higher and lower than average temperatures. In addition to the problems these extremes pose to chicks, they also affect the incubating or brooding hen (Coe et al. 2015, Belnap et al. 2019), which can increase chicks vulnerability to predation if the hen is forced to abandon her nest or brood (Kauffman et al. 2021). Precipitation that occurs along with lower-than-average temperatures was also associated with lower survival (Belnap et al. 2019), however, precipitation has also proven to be beneficial to survival in certain ecoregions that typically exhibit warmer spring and summer temperatures (Hernandez et al. 2005).

The threats listed above typically act in conjunction with each other, however; cover and food availability as well as predator abundance and predation attempts, can be heavily influenced by weather events and subsequently affect chick survival (Guthery et al. 2000, Carey 2009, Carroll et al. 2018). As previously mentioned, chicks are particularly sensitive to temperature extremes as well as to the effects of drought and flooding which can lead either to vegetation die-off or an excess of vegetation (Giuliano and Lutz 1993). Above average temperatures and reduced rainfall that commonly occur with drought can result in vegetation die-off and produce a decrease in invertebrates, the predominant food source of scaled quail chicks (Hurst 1972, Taylor and Guthery 1994, Orange 2015). Conversely, excess vegetation that can occur with increased precipitation can potentially hinder the movement of chicks, who rely on bare ground for ease of movement (Giuliano and Lutz 1993, Orange et al. 2016b). Additionally, Orange (2015) concluded that the seemingly larger home range of scaled quail chicks in comparison with northern bobwhites (*Colinus virginianus*), paired with the energetic output required to find invertebrates possibly makes them more susceptible to predation from avian predators, subsequently lowering chances for survival.

Vegetation composition may be of equal, if not of greater concern than extreme weather events, as it is a factor that managers can control to mitigate population decreases (Rho et al. 2015, Kauffman 2019, Fulbright et al. 2019). Focusing on changes in landscape composition is critical in scaled quail habitat management for both adults and broods, especially woody vegetation encroachment and habitat fragmentation due to historical and current agricultural practices and climate change (Wilcox et al. 2012, Rho et al. 2015). Historical stocking densities in the SHP exhibited a sharp increase in the mid 1930’s, a decrease in the 1940’s, leveled out in the 1960’s (~60% below peak) and have remained largely unchanged (Wilcox et al. 2012, Rho et al. 2015). Larger scaled quail populations correlate with habitat that is comprised of larger patches of grassland and lower percentages of pasture-cropland (Bridges et al. 2002, Rho et al. 2015). Additionally, woody vegetation, mesquite in particular, has a high-water demand and directly competes with surrounding forbs and negatively influences forb production and resulting invertebrate populations (Van Auken 2000, Orange 2015, Shackleton et al. 2015). Thus, understanding the relationship between woody vegetation encroachment and other landscape changes in relation to brood survival is crucial in forming management recommendations (Guthery et al. 2000, Lusk et al. 2002, Rho et al. 2015).

Unreliable counting methods such as flush counts increase inaccuracies in estimating chick counts, especially when accounting for the potential of brood amalgamations (Faircloth et al. 2005, Pleasant et al. 2006, Orange et al. 2016a, Orange et al. 2016b). Use of thermal cameras to count quail broods has been recently tested on northern bobwhite chicks, though the researchers had moderate success, sample sizes were comparatively small, and the research was conducted using pen raised chicks in a controlled environment (Andes et al. 2012). Due to small chick size and potential flushing as well as possible interference from surrounding vegetation, thermal imaging technology is currently not practical for obtaining accurate brood counts (McCafferty 2013). Another commonly used technique for brood counts is the corral method, described by Smith et al. (2003), which is a more time and labor-intensive method, but fairly accurate.

Occurrences of brood amalgamations are a relatively new and understudied area of research among quail species; however, amalgamations occur in multiple species of birds including waterfowl and various species of Galliformes (Savard et al. 1998, Beauchamp 1998, Faircloth et al. 2005, Orange et al. 2016a). If researchers observe and record brood amalgamations, this could potentially increase the accuracy of chick survival estimates, as the chicks would not be incorrectly marked as mortalities (Faircloth et al. 2005, Orange et al. 2016a). An ideal method for studying brood amalgamations is to equip chicks with small VHF transmitters to better estimate survival and track their movements (Dreitz et al. 2011, Orange 2015, Orange 2016a).

My objectives were to: 1) estimate scaled quail brood survival; 2) assess the influence of temperature and vegetation composition and structure on brood survival; 3) examine the influence of temperature and vegetation composition and structure on brood site selection (third-order selection, Krausman 1999); and 4) quantify the percent composition of woody cover at brood home ranges (second-order selection, Krausman 1999). Additionally, I assessed the relationships between weather variability and vegetation composition and structure on brood survival (Guthery et al. 1988, Pleasant et al. 2006). I hypothesized that chick survival rates would be positively related to lower temperatures at brood sites as well as a lower percentage of woody cover (Carey et al. 2009, Reyna and Burggren 2012, Rho et al. 2015). I hypothesized that brood survival would correlate with vegetation types that offer the coolest temperatures and thermal cover (Wilson et al. 1979, Lusk et al. 2001, Pleasant et al. 2006).

## Methods

### Study Site

I monitored scaled quail on a ranch in Potter County, Texas (Figure 14), it is a working cattle ranch and supported several large herds of beef cattle that were occasionally rotated between pastures, as well as a herd of horses. The ranch was also used for oil production and hunting. Additionally, there is an active supplemental feeding program with approximately 180 quail feeders scattered across the ranch, and feed is periodically broadcasted along the ranch roads. The ranch is in the SHP ecoregion, which is characterized by a semi-arid climate, and has been collaborating with the Quail-Tech Alliance at Texas Tech University and participating in spring call counts since 2010. The average yearly rainfall is approximately 40–56 cm, and the primary soil types vary from clay to sand with caliche underlying the surface soils. (Texas Parks and Wildlife Department Ecoregions).

According to Texas Parks and Wildlife Department, the SHP is largely comprised of shortgrass prairie or mesquite grassland, with native grasses including sideoats grama (*Bouteloua* curtipendula), blue grama (*Bouteloua* gracilis), hairy grama (*Bouteloua hirsuta*), and buffalo grass (*Bouteloua* dactyloides). The region also supports forbs, legumes, and woody species, which include redberry juniper (*Juniperus pinchotii*), yucca (*Yucca* spp.), mesquite (*Prosopis glandulosa*), sand shinnery oak (*Quercus havardii*), lotebush (*Ziziphus obtusifolia*), hackberry (*Celtis occidentalis*), prickly pear *(Opuntia* spp.), skunkbush sumac (*Rhus trilobata*), plum (*Prunus* spp.), and catclaw acacia (*Acacia greggii*), among many others. Much of the region has been influenced by agriculture and ranching, with cropland averaging between 30%–60% of the landscape (Texas Parks and Wildlife Ecoregions).

## Capture, Tagging, and Monitoring Methods

I tracked broods via the radiotransmittered hen every 3 days post hatch. I also attempted to equip chicks with 2-gram (American Wildlife Enterprises, Monticello, Florida) glue-on VHF radio-transmitters (Drietz et al. 2011), unfortunately I had some difficulty with this as the glue-ons typically fell off within a few days of tagging. I continuously sampled broods throughout the field season (April 1 through August 15) using walk-in funnel traps (Smith et al. 1981) baited with milo and covered with available surrounding vegetation. I set traps before sunrise, checked them mid-day and again at sundown. I released all non-target species captures immediately. After birds were removed from traps, I placed them into mesh bird bags for a maximum of 30 minutes during processing. I applied aluminum butt-end leg bands (National Band and Tag Co., Newport, Kentucky, No. 8 bands) on the left leg of each chick captured in traps and equipped any chicks (≤2 days old, Dreitz et al. 2011) inadvertently sampled with the glue-on transmitters mentioned above. I estimated age of chicks sampled from traps based on aging techniques described by Cain and Beasom (1983), as well as by weight. I tracked broods from the time of nest hatch until August 15. All trapping and collection were allowed under the authority of Texas Parks and Wildlife Department Scientific Collecting Permit #SPR–1217–243.

## Brood Site Selection Characteristics

I placed two Ibutton dataloggers (Maxim Integrated Products, Sunnyville, California, USA) (hereafter "ibuttons) at each brood location point, and two at a random location 5 m away to assess effects of microclimate temperature conditions on brood sites and brood site selection. Random locations were selected using a random number generator to select a direction between 0 and 360 degrees. Ibuttons recorded temperature every 30 minutes and remained at the brood site locations for two weeks. Vegetation characteristics at brood sites were determined by conducting vegetation surveys at brood sites and paired random locations between 15 and 360 m away. I estimated stems per hectare and visual obstruction of grass and shrubs, separately using a robel pole (Robel et al. 1970). I assessed species composition using a Daubenmire frame at the nest bowl at 1 m, 5 m, 10 m, and 15 m in each cardinal direction, separating each type into 5 classes (litter, grass, forb, bare ground, shrub) noting litter height and tallest plant, as well as species of shrub and woody vegetation encountered (Daubenmire 1959). In addition, I gathered overall woody vegetation inventory within a 50 m radius from brood sites and paired random locations.

## Brood Survival

Broods were tracked via the VHF or GPS-tagged hens, or by individually VHF-tagged chicks (glue-on transmitters) every three days following first capture. Broods were flushed one time and loafing vegetation type was recorded. I continued monitoring broods until the end of the season or until the hen was found dead or the glue-on transmitter fell off.

### Home Range and Woody Vegetation Usage

I flew a Sensefly Ebee mapping drone with a S.O.D.A. (Sensor Optimized for Drone Applications) camera (Sensefly SA, Cheseaux-Lausanne, Switzerland) that acquired RGB imagery and measured spectral wavelengths between 400 – 1,000 (Red, Green, and Blue (RGB) wavelength intervals). Drone flights were Programmed using Sensefly eMotion3, mapped out to ensure they covered all GPS-recorded hen locations. I created orthomosaic images from the drone photos which were used to delineate landcover for each hen home range for landscape level habitat metrics to be included in habitat selection and survival models. The drone provided a great advantage over using free satellite imagery because imagery alone can become outdated quickly. Leaf loss in deciduous woody cover and grazing of herbaceous cover can quickly change habitat structure. Thus, basing habitat selection studies for this specific habitat on outdated imagery could bias conclusions due to the time lag between selection and when image data for the area was acquired. Additionally, I collected weather data from the West Texas Mesonet which has stations located near each ranch and provides detailed, long term weather data.

## Statistical Analysis

### Brood Site Selection Characteristics

I evaluated microclimate temperature conditions at both brood site and at random location using Proc Means in SAS (Version 9.3) (Grisham et al. 2016). I calculated summary statistics for temperature collected by the ibuttons which were grouped together by day and night as well as used vs random. I compared empirical distribution functions of brood site temperature (1) between used vs random, and (2) between brood checks. Brood checks occurred every 3 days and comprised of VHF tracking the brooding hen or individual broods and flushing them to obtain an estimate of the size of the brood as well as record the type of vegetation they flushed from. A brood was defined as each individual group of chicks, either with or without a brooding hen Empirical distribution functions are defined as the distribution of the cumulative data points in the sample and converge to a probability of 1 (Zar 2010). I used the Kolmogorov-Smirnov test to determine differences in empirical distribution functions for temperature and among each comparison (Grisham et al. 2016).

I reported the Kolmogorov-Smirnov statistic, asymptotic statistic, maximum deviation (MD), and the percentage of observations that fell to the left of the MD. The MD was defined as the value that maximized differences in the empirical distribution function among parameters (Grisham et al. 2016). Cooler distribution functions are characterized by a larger proportion of observations that fall to the left of the MD, where warmer distribution functions are characterized by larger proportions of observations on the right side of the MD. I conducted pairwise comparisons for both objectives using a 2-sample Kuiper statistic in PROC NPAR1WAY in SAS (Version 9.3). For all comparisons I reported the Kuiper statistic, asymptotic statistic, MD, and percentage of observations that fell to the left of the MD for temperature.

For the logistic regression analysis (Fritts et al. 2016), I focused on VOR measurements at the 0 and 100 percent, as studies have shown these to be the most influential vegetation heights for grassland birds (Grisham et al. 2016). I used the vegetation and temperature variables as independent continuous covariates. Before conducting models, I used variance inflation factors to assess collinearity among independent variables and dropped a covariate from the model if the factor was >3 (Zuur et al. 2009). I selected models *a priori* to examine the influence of variables on habitat use. I separately conducted models that combined vegetation structure at each measured distance from the point (e.g., all vegetation types at point center), models with each vegetation structure type at each distance from the point (e.g., shrubs at point center, 1 m, 5 m, 10 m, 15 m together), and models that combined vegetation and weather covariates. I compared models using AIC and averaged models within Δ4 AIC from the AIC top model. I assessed model fit of all averaged models by comparing each model with a null model using an analysis of variance. I evaluated the significant of each variable by omitting variables with 90$^{th}$ confidence intervals that overlapped 0.

**Brood Survival**

I developed several *a priori* models to assess brood survival and evaluated using the logit-link function in the nest survival model in Program MARK. I based candidate models on previous studies of scaled quail as well as incorporated temperature and habitat data collected at the brood site. I tested for multicollinearity using the Pearson's coefficient test (r<1) and all variables were automatically scaled in Program MARK. I assessed the effects of various factors on brood survival such as: main vegetation type, visual obstruction, microclimate temperature collected from ibuttons (mean, maximum, and number of 30-minute increments ≥40° C) (Grisham et al. 2016), precipitation using data recorded by the West Texas Mesonet, percentage of woody vegetation within a 50 m radius of the brood site, total area and percentage of each land cover type, and largest patch index. I used an information-theoretic approach and Akaike's Information

Criterion (AIC*c*) and selected the model with the lowest AIC*c* and evaluated the effect of each covariate on brood survival (Burnham and Anderson 2002).

**Home Range and Woody Vegetation Usage**

I estimated habitat selection using the data acquired from GPS-tagged hens with broods only, as well as VHF-tagged chicks in conjunction with the drone imagery and vegetation surveys to assess percent composition of woody vegetation in both used and random brood habitat. I used the Brownian Bridge Movement Model in Program R (Horne et al. 2007, Walter and Fischer 2016) to define home range (90% contours) and core use areas (50% contours) of GPS-tagged hens. The approximate positional error of the GPS units was 25.42 m (R. White personal communication). I used the drone images to assess percent composition of woody vegetation across used and random home ranges. Random home ranges were generated in ArcGIS Pro (version 2.7.2) using the generate random point tool. I created points and added a buffer of the average-sized home range. To calculate home ranges of VHF-tagged chicks I imported all recorded locations from weekly tracking into ArcGIS Pro and created polygons around the points for each brood. I overlayed the classified raster images with the polygons, clipped out the home ranges and used Fragstats to calculate land cover characteristics of brood home ranges. I used Fragstats (version 4.2) to calculate class area (CA), percent land cover (PLAND), largest patch index (LPI), and edge density (ED).

Pre-processing was done using Pix4Dmapper (Prilly, Switzerland) to stitch drone photos together to create orthomosaics. This involved an automatic, 3-step process that starts with initial processing, which includes keypoint extraction and matching, camera model optimization, and geolocation, as well as creation of tie points. The second step is the creation of densified point cloud and 3D textured mesh. The third step is the creation of the digital surface model (DSM), orthomosaic, and reflectance map. Orthomosaics were imported into ArcMap (version 10.7) and classified using the classification wizard. This process included creation of training samples using 6 different classes, cholla, yucca, bare ground, herbaceous shrub (primarily skunkbush and sand sagebrush), grassland, structures (man-made), and woody veg (mesquite). Classes were chosen based on previous scaled quail habitat use research and field observations, with an emphasis on woody vegetation (mesquite) classification. The cases in which classes needed to be combined to increase accuracy, cholla, yucca, and grassland were grouped into one class and labeled succulents/grassland. This occurred with images where the spectral signatures of succulent species (cholla and yucca) were similar to grassland, either due to original image quality or time of day of the flight. Training samples were then used to produce a signature file, which was used to classify the images using the maximum likelihood classification method. The resulting classified images had to be resampled using the majority resampling technique in ArcMap to increase the pixel sizes to 3x3 and reduce the file size to be imported into Fragstats (version 4.2).

I conducted accuracy assessments of each classified image by calculating confusion matrices, which were created in Microsoft Excel. For each confusion matrix I calculated the overall *kappa* and conditional *kappa* which illustrated the level of agreement and percent of data that are reliable on a scale of 0 to 1. I also calculated producer and user accuracy, which represent the commission and omission errors, respectively. Commission error is the value assigned based on the amount of misclassification into each specific class. Omission error represents false negatives and represent the value in each class that were incorrectly predicted to be in a different class. Once I obtained an overall accuracy of at least 50%, I exported all raster images as tif files into Fragstats and calculated class area (CA), percent land cover (PLAND), largest patch index (LPI), and edge density (ED).

I compared the differences between used and random home ranges using logistic regression with the covariates being metrics calculated in Fragstats (version 4.2). The response variable was brood home range and the 50 random locations (1 = used hen home range; 0 = random), and the covariates were CA, PLAND, LPI, and ED. Before conducting models, I used variance inflation factors to assess collinearity among independent variables and dropped a covariate from the model if the factor was >3 (Zuur et al. 2009). I compared competing models using AIC and averaged models within Δ4 AIC from the AIC top model. I assessed model fit of all averaged models by comparing each model with a null model using an analysis of variance. I evaluated the significance of each variable by omitting variables with $90^{th}$ confidence intervals that included 0. I assessed the same metrics listed above at the ranch level, which was defined by all the orthomosaics combined, as well as at the 50 home ranges described above to assess used versus random at the home range scale.

## Results

### Brood Site Selection Characteristics

I deployed ibuttons at 27 brood sites from 12 different broods in 2020 (Table 18 and 3, Figure 15). Empirical distribution functions between used and random among brood checks indicated there was a difference in temperature between brood sites and random sites amongst checks (Table 17, Figure 16), 92% temperature recordings at brood sites and 74% at random sites were to the left of the MD (40° C). 94% of temperature observations at the first check were located left of the MD (40° C) versus 75% at random sites (Figure 17, Table 17). 90% of temperature observations at second check were located left of the MD (38° C), versus 69% at random sites (Figure 18, Table 17). 94% of temperature observations at third checks were located left of the MD (42.5° C) versus 77% at random sites (Figure 19, Table 17). 86% of temperature observations at the fourth check were located left of the MD (39° C) versus 73% at random sites (Figure 20, Table 17). 99% of temperature observations at the fifth check were located left of the MD (43.5° C) versus 69% at random sites (Figure 21, Table 17). Additionally, average temperatures at brood sites were approximately 3° C cooler than random sites.

I assessed site characteristics at 24 brood sites (12 broods) across the 2019 and 2020 field seasons (Table 20, 21). The most frequently selected vegetation types for brood sites was mesquite (38%) and cholla (29%). Based on the top model from the logistic regression, scaled quail broods select for nest sites with lower average temperature ($\beta$ = -2.92, SE = 1.07, 90% CI: -4.68, -1.16) and less grass cover ($\beta$ = -9.72, SE = 3.20, 90% CI: -14.98, -4.46) (Table 22, Figure 22).

**Brood Survival**

I compared 7 candidate models (N= 18) and calculated daily brood survival to be 89% across both years (SE: 0.04; 90% CI: 0.95, 0.82; Table 24). Survival probability that a brood would survive to the end of the season (80 days) was <1% (SE: 0.0003, 90% CI: 0.0004, -0.0003). The top model indicated a greater number of increments (temperature recordings over 40° C) (SE: 0.0009, 90% CI: 0.003, 0.001) were associated with a higher probability of brood survival.

**Home Range and Woody Vegetation Usage**

I flew the drone for approximately 5 hours and 48 minutes at an altitude between 119 and 160 meters and captured approximately 5,000 images from 8 flights between both years. Drone flights for the 2019 season were conducted on August 10 between 1000 hrs and 1500 hrs, separated into 3 different missions. Flights for the 2020 season were conducted August 8 – 14 between 1000 hrs and 1500 hrs, separated into 5 different missions. I assessed the accuracy of each of my classified rasters using confusion matrices calculated in Excel. Overall classification accuracy ranged between approximately 56-86% (Table 25). Class specific accuracies ranged from poor to perfect (11 % to 100%) (Table 25), producer's accuracy for cholla ranged between 23% to 94% (average 57%), user's accuracy ranged between 40% to 81% (average 55%). Producer's accuracy for yucca ranged between 50% to 90% (average 74%), user's accuracy ranged between 50% to 57% (average 55%). Producer's accuracy for succulents/grassland was 80%, user's accuracy ranged between 68% to 75% (average 71%). Producer's accuracy for bare ground ranged between 56% to 96% (average 88%), user's accuracy ranged between 88% to 100% (average 99%). Producer's accuracy for herbaceous shrub ranged between 12% to 73% (39%), user's accuracy ranged between 29% to 74% (average 55%). Producer's accuracy for grassland ranged between 31% to 73% (average 52%), user's accuracy ranged between 26% to 81% (average 49%). Producer's accuracy for woody vegetation ranged between 39% to 90% (average 68%), user's accuracy ranged between 51% to 89% (average 73%). Producer's accuracy for structures was 65% and user’s accuracy was 68%. Kappa coefficient of agreement statistics ranged between 0.477 to 0.643 and average 0.559. indicating there was a poor to moderate agreement amongst all of the classified images (Table 25).

I calculated the home range of 1 brood of approximately 13 chicks with a GPS tagged hen (Figure 23), and analyzed areas surrounding points from two VHF-tagged chicks in groups of 3-4 (Figure 24) (second-order selection, Krausman 1999). The GPS-tagged brood had a home range of 182 ha and comprised of 1.6% (0.3 ha) woody vegetation in the core use area and 2.4% (3.2 ha) woody vegetation in the home range (Table 26, 27). I only analyzed 25 ha and 29 ha for the two VHF-tagged chicks due to the low number of locations. These areas comprised of 2.5% (0.6 ha) and 1.7% (0.5 ha) woody vegetation (Table 26, 27). The greatest percentage of landcover across all areas was the succulent/grassland class, between 74% and 85%. Bare ground comprised 4% (4 ha) of the calculated areas, herbaceous shrub comprised of 7% (4 ha), and 0.7% (1 ha) was structures (Table 26). Largest patch index occurred in the grassland/succulents class and ranged between 76% to 84% (Table 28). Average edge density was 611 ha and ranged between 20 ha and 867 ha (Table 29) (third-order selection, Krausman 1999).

Among the 50 (57 ha) randomly calculated home ranges, woody vegetation averaged at 1% (0.3 ha) (Table 30, 31). The succulent/grassland class type averaged at 85%, 8% bare ground, 3% herbaceous shrub, and 0.2% structures (Table 30, 31). Average edge density was 809 ha and ranged between 346 ha and 1332 ha (Table 33). I compared 9 candidate models for my used versus random home range analysis and my top model indicated that class area (ha) of bare ground ($\beta$ = -0.23, 90% CI: -0.11, -0.34) and class area (ha) of yucca ($\beta$ = 0.14, 90% CI: 0.21, 0.07) were both statistically significant. At the ranch level, which was defined as all the raster images combined, woody vegetation averaged at 1.4% across 1,045 ha, with 77% succulents/grassland, 25% herbaceous shrub, 6% bare ground, and 0.3% structures. Total edge was calculated at 6,448,302 m (first-order selection, Krausman 1999).

## Discussion

### Brood Site Selection Characteristics

The most frequently selected vegetation type for daytime loafing by scaled quail broods was observed to be mesquite and cholla. Literature suggests that mesquite is highly beneficial for loafing due to the thermal cover it provides (Guthery et al. 2001a, Carroll et al. 2016). Mesquite averaged 2° C cooler than cholla and maximum temperatures averaged 8° C cooler than cholla. Microclimate conditions at brood sites are critical, as sustained temperatures above 40° C can result in physiological stress and death in chicks (Pleasant et al. 2006, Belnap et al. 2019). However, I suspect that woody vegetation can result in greater temperatures at the microclimate level in the long-run, as mesquite can lower habitat quality through competition with native vegetation (Rho et al. 2015, Shackleton et al. 2015).

I determined that brood site selection in my study was most affected by average temperature and grass cover in my study, indicating that broods selected for sites with lower average temperature and less grass cover. This correlates with past studies suggesting that chicks avoid areas with tall grass because it hinders their ability to move and prefer locations that provide cooler temperatures (Pleasant et al. 2006, Kauffman 2019). Interestingly, Kauffman et al. (2021) hypothesized that increased temperatures at microsites were positively correlated with grass cover, presumably due to two reasons. The first being that taller grass cover could act as an insulate and impede airflow, and the second was that higher grass cover may absorb the surrounding ambient temperature and radiate it out into the environment. This brings into question what the optimal vegetation type for chicks is. Although native shrub and succulent cover, like yucca, is typically optimal for nest survival, it does not provide the same amount of overhead cover as mesquite, potentially making it less desirable for broods despite the cooler temperatures it can provide. Cholla was the second most selected vegetation type for broods, but it had significantly greater temperatures, again, making it less optimal for thermal protection.

I suspect the negative relationship with grass cover in brood habitat was more closely related to grass height, rather than grass cover, as native grass species such as bunchgrass are an important component of scaled quail habitat. Arthropods comprise of the majority of scaled quail chick diet (Hurst 1972, Orange 2015), and native grass species and plant communities support greater arthropod diversity (Sands et al. 2009, Butler 2019). Although scaled quail chicks require some level of bare ground or shorter grass for easier movement, native bunchgrasses structure allow for this due to their because chicks can easily navigate in between the bunches (Martin et al. 2015, Fulbright et al. 2019). Additionally, grass species support lower ground temperatures than woody vegetation because they can provide more airflow at the ground level, and lower amounts of bare ground in comparison to mesquite, which typically does not allow for grass growth underneath (Canadell et al. 1996, He et al. 2010). The lack of vegetation at the base of mesquite trees could be attractive to scaled quail because it does provide that overhead cover and freedom of movement, but it also makes them more vulnerable to predation and exposed to weather elements.

According to the West Texas Mesonet, total rainfall in 2019 was approximately 66 cm versus 33 cm in 2020. Monthly rainfall averages were similar between the two years until April. The April monthly total in 2019 was 7 cm, versus 0.6 cm in April 2020, with the monthly averages being higher for the remainder of 2019. Additionally, average maximum temperatures were higher earlier in the season in 2020 than they were in 2019, with the average maximum occurring in August at 40° C in 2019, versus 43° C and 40.5° C in July and August of 2020 (West Texas Mesonet). Apart from forbs and bare ground, all vegetation measurements collected in 2020 had higher percentages of each ground cover type, as well as increased visual obstruction and taller vegetation heights. Unfortunately, I was unable to collect microclimate data for brood sites in 2019, so my data were all collected from the 2020 season. Thus, weather conditions, specifically the occurrence of higher temperatures earlier in the year, likely influenced brood site selection in my study.

Similar to previous findings, I observed that brood site temperatures averaged greater than non-brooding hen sites, also observed by Kauffman (2019), who speculated that brooding hens were selecting areas with increased food resources at the cost of greater temperatures. Kauffman (2019) highlighted that brooding hen needs to also be considered when analyzing microclimate conditions at brood sites. In my study, non-brooding hens selected for cooler locations with less forbs and bare ground. Both of which are typically preferred by chicks, especially forbs as they support invertebrates, which are the primary food source during development (Orange 2015). As previously mentioned, and supported by my findings, chicks prefer shorter grass to promote easier movement (Orange 2015, Kauffman 2019). However, this can be detrimental to brooding hens, as this can make them more susceptible to predation (Kauffman 2019).

**Brood Survival**

My calculated daily survival rates for broods were comparatively low in relation to other chick survival studies. Terhune et al. (2019) estimated northern bobwhite chick survival rates from 1999 to 2017 to be between 14.6% and 76.9% at the Tall Timbers Research station in Florida. DeMaso et al. (2014) estimated northern bobwhite chick survival rates between 50% and 75% in the south Texas plains between 2001 and 2005. Scaled quail chick survival (≥ 21 days post hatch) was estimated between 10% and 48% in the SHP in 1999 and 2000 (Pleasant et al. 2003), and 48% to 82% in western Oklahoma between 2013 and 2014 (Orange 2015). I had a total of 6 nest successes and broods that I monitored until chicks were no longer with the hen for two consecutive checks (~7 days). Additionally, I captured 3 hens with broods in 2019 and 7 in 2020 that were either with a hen or a brood without an adult and tracked their progress as well. One brood (N = ~13) in 2020 survived from capture until the end of the season and did not appear to suffer any mortalities. Interestingly, my top model indicated that brood survival was associated with a higher number of temperature recordings over 40° C. This correlates with two studies by Pleasant et al. (2006) and Kauffman (2019) who also discovered a positive relationship between chick survival and high temperatures. Pleasant et al. (2006) postulated that this could be because chicks are typically subjected to greater temperatures during their first week of life with the hen, highlighted by pen-raised quail practices where artificial brooders are kept at approximately 38° C for the first week of life (Dozier et al. 2010). Thus, higher temperatures that typically coincide with clutch hatching in the SHP could be potentially beneficial for scaled quail chick survival (Pleasant et al. 2006, Kauffman et al. 2021).

However, as previously mentioned, high temperatures and drought conditions have been documented to be detrimental to quail chicks (Hernandez et al. 2005, Terhune et al. 2019). Over a 19-year period, Terhune et al. (2019) observed their lowest daily survival rates in 2007 which was the only drought year to occur during their study. Overall, they determined that temperature had less of an impact than precipitation at their study site in Florida, with the exception of lower-than-average temperatures occurring with precipitation (Terhune et al. 2019). Additionally, they hypothesized that fluctuations in temperature could potentially impact chick survival, which has been studied and documented in relation to incubation and increased nest failures (Carroll et al. 2018, Kauffman et al. 2021). While I was unable to measure chick survival for the 2019 season, the greater-than-average temperatures earlier in the season and dryer conditions in 2020 likely influenced chick survival rates similarly to hen survival rates.

Broods can become more vulnerable if the brooding hen is predated, although there have been observations of paired adult males taking over brooding responsibilities if a hen is predated (Orange 2015). Additionally, brood amalgamations have been observed in multiple bobwhite and scaled quail studies, although it is more common in bobwhites (Faircloth et al. 2005, Orange 2015). I did observe one instance of an amalgamation between two groups of juveniles, however, it occurred towards the end of the season when the broods were no longer with a hen (Pleasant 2003). Lunsford et al. (2020) conducted a study researching the specifics of brood defense behaviors in northern bobwhites, highlighting that intense adult defense behaviors can impact chick survival during early life stages. Northern bobwhite hens exhibited multiple behaviors intended to draw predators away from broods, including “injury-feigning” (Lunsford et al. 2020). This has not yet been documented in scaled quail hens, but the similarities between scaled quail and northern bobwhites suggest that scaled quail hens could possibly exhibit this behavior as well. Further research looking into this phenomenon is required to determine if scaled quail hens with increased brood defense behavior have broods with higher survival rates.

**Home Range and Woody Vegetation Composition**

Interestingly, the only GPS-tagged hen with a brood had the second largest home range of all the radio-tagged adult scaled quail. Due to the low number of locations for the other two broods, I do not consider those to be calculated home ranges as they were closer to the size of core use areas. I detected a negative relationship with bare ground and a positive relationship with succulent-type vegetation at the home range level for broods, which could be due to brooding hen preferences or greater predation risks associated with more bare ground. Orange (2015) discovered somethings similar in their study, scaled quail broods selected greater percentages of short-grass and yucca vegetation types at the home range scale.

Past research has highlighted that scaled quail generally have larger home ranges than northern bobwhites at the youth life stages, indicating this could be due to the habitat differences observed between northern bobwhites and scaled quail (Orange 2015). In conjunction with my findings, Orange (2015) discovered that scaled quail appear to select for more open ground and less structurally dense vegetation, which subsequently requires scaled quail chicks to travel farther distances for food resources (Orange 2015). These two characteristics can increase the chances of predation in chicks, as they are not only traveling farther distances, but they are also more exposed to the elements.

Although I calculated a moderate agreement in my accuracy assessment of the classified drone images, I had to consider the variability amongst image quality between years as well as flights when analyzing the results of my home range selection analyses. Drone flights for the 2019 season were all conducted on the same day during a single afternoon. However, drone flights for the 2020 season were conducted across multiple days, and some flights had to be separated between days due to technical difficulties as well as work schedule constraints. However, I was able to fly the drone on fully sunny days for all flights. Additionally, the similarities in the spectral signatures of green vegetation (grassland, succulent species, herbaceous shrubs), posed some difficulties during the classification process and likely influenced our accuracy assessments. Lastly, some of the images were of lower quality, presumably due to wind interference, and made differentiating grassland, yucca, and cholla particularly challenging.

I did not detect a significant difference between the amount of woody vegetation in brood areas in comparison to random home ranges, they appeared to use woody vegetation in the proportion that it was available at the landscape-level, correlating with findings from Kline et al. (2019) as well as with my adult home range analysis. Field observations suggest that broods frequently select for mesquite for loafing cover at brood sites, however, I hypothesize that there is possibly a “source-sink” type of relationship between scaled quail and mesquite (Battin 2004). Although it is a potentially damaging invasive (Shackleton et al. 2015, Rho et al. 2015), it appears to be superior to native vegetation in terms of overhead and thermal cover, making it potentially more desirable for brood site selection (Kauffman 2019). Kauffman (2019) detected that scaled quail in southern New Mexico prefer tall mesquite (>1.5 m), their findings indicated that scaled quail selected for mesquite in that region.

## Conclusion

As previously mentioned, there is very limited data on scaled quail chicks, and my research was intended to fill in some of the numerous gaps in the literature. Temperature and vegetation structure at both brood sites and at the home range scale appeared to be the most important factors influencing brood site selection as well as chick survival. Grass and native shrub cover were the two most important vegetation components in my study, both of which can heavily influence temperatures at brood sites (Kauffman et al. 2021). Although mesquite was observed being used by broods, I detected no statistical significance or influence on brood site selection or survival. Previous research conducted on galliform chicks indicate that they are flexible in their site selection and will select many different habitat types to maximize survival (Hovick et al. 2014, Orange 2015, Terhune et al. 2019). I suggest that future studies conducted on scaled quail chicks look further into microclimate conditions and vegetation structures at brood sites, as well as brood usage of woody vegetation.

Management implications include improving vegetation structures on landscapes where landowners want to manage for scaled quail in the SHP ecoregion. Specifically, by managing grass heights with low to medium grazing intensity regimes and decreasing mesquite encroachment to further increase grass and native shrub production; as well as decrease amounts of bare ground, both of which were important to scaled quail brood survival in my study. Implementing prescribed burning plans in conjunction with grazing regimes on landscapes with pervasive mesquite encroachment are likely the best course of action to improve habitat quality. According to Texas Parks and Wildlife, approximately one-third of total area of native grass should be burned every three years, on a rotational schedule during either late August – September, or March – April.

***Table 17. Scaled Quail (Callipepla squamata) Brood Site Empirical Distribution Function Output of Proportional Temperature Data from the Southern High Plains of Texas Between 2020 (April 1 – August 15) Checks, Quantiles all refer to proportions of temperatures that occur in each (i.e. 25% of temperatures occur below 22° C, and 75% occur above)***

| Point Location | Check Number | Categories Band Number | N | Mean | Standard Error | Min | Temperature Max | 25th Quantile | 50th Quantile | 75th Quantile | 95th Quantile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Brood | 1 | 5781 | 510 | 12.24 | 0.54 | 17 | 62.5 | 22 | 28 | 43.5 | 55 |
| | | 6431 | 1072 | 10.45 | 0.32 | 16 | 61 | 23 | 28 | 40 | 51.5 |
| | | 6433 | 990 | 9.65 | 0.31 | 16.5 | 55.5 | 22 | 27.5 | 37.5 | 48 |
| | | 6434 | 990 | 11.29 | 0.36 | 15.5 | 53.5 | 20.5 | 26.5 | 40.5 | 49.5 |
| | | 6514 | 1020 | 10.54 | 0.33 | 18 | 59 | 23.75 | 29.5 | 40.5 | 53.5 |
| | | 6541 | 990 | 11.68 | 0.37 | 15 | 55.5 | 20.5 | 25.5 | 42.5 | 50 |
| | | 7749 | 92 | 9.95 | 1.04 | 17.5 | 50.5 | 22.5 | 27.25 | 39.75 | 49 |
| | | 7754 | 990 | 11.72 | 0.37 | 16.5 | 56 | 20.5 | 24.5 | 43 | 50 |
| | | 7758 | 1020 | 9.98 | 0.31 | 18.5 | 58 | 24.5 | 30 | 40.5 | 52 |
| | | 7767 | 92 | 9.81 | 1.02 | 21.5 | 52.5 | 24 | 26.75 | 40 | 51.5 |
| | | 7772 | 92 | 8.79 | 0.92 | 19.5 | 51.5 | 24.5 | 26.75 | 37.25 | 49.5 |
| | | 7788 | 1182 | 11.16 | 0.32 | 18 | 61.5 | 22.5 | 27 | 39.5 | 54 |
| Random | | 5781 | 1020 | 7.81 | 0.24 | 17.5 | 54 | 22.5 | 27 | 34 | 43.75 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6431 | 1072 | 6.42 | 0.2 | 17.5 | 43.5 | 22 | 25 | 33 | 38.5 |
| | | 6433 | 990 | 6.77 | 0.22 | 16.5 | 42 | 21.5 | 27.5 | 35 | 38.5 |
| | | 6434 | 990 | 8.06 | 0.26 | 15 | 46 | 20.5 | 25 | 35.5 | 41 |
| | | 6514 | 1020 | 8.71 | 0.27 | 17 | 53.5 | 22 | 26.5 | 35.5 | 46.5 |
| | | 6541 | 990 | 5.45 | 0.17 | 16.5 | 37 | 21 | 25 | 31.5 | 34.5 |
| | | 7749 | 92 | 6.02 | 0.63 | 18 | 38 | 22 | 24.75 | 32.75 | 37 |
| | | 7754 | 990 | 6.35 | 0.2 | 17.5 | 42 | 21.5 | 26.75 | 34 | 37.5 |
| | | 7758 | 1020 | 7.73 | 0.24 | 17 | 50 | 22.5 | 27 | 35 | 44 |
| | | 7767 | 92 | 4.84 | 0.5 | 19 | 38 | 22.5 | 25 | 30.25 | 35.5 |
| | | 7772 | 92 | 6.69 | 0.7 | 18 | 41.5 | 23 | 26.75 | 35.25 | 40.5 |
| | | 7788 | 591 | 6.88 | 0.28 | 18 | 46 | 23 | 27 | 33 | 42 |
| Brood | 2 | 6431 | 536 | 10.27 | 0.44 | 18.5 | 54 | 22 | 28 | 41 | 49.5 |
| | | 6514 | 1020 | 10.53 | 0.33 | 17.5 | 58 | 24 | 29.5 | 41 | 53 |
| | | 7749 | 92 | 8.53 | 0.89 | 18 | 47 | 22.75 | 27 | 37.5 | 46 |
| | | 7754 | 990 | 11.27 | 0.36 | 16.5 | 55 | 21 | 26.5 | 42 | 50 |
| | | 7788 | 555 | 10.41 | 0.44 | 18.5 | 57 | 22.5 | 28.5 | 40.5 | 51.5 |
| Random | | 6431 | 1072 | 6.41 | 0.2 | 17.5 | 45 | 21.5 | 25 | 33 | 38.5 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6514 | 1020 | 9.33 | 0.29 | 17.5 | 57.5 | 23 | 27.5 | 37 | 49 |
| | | 7749 | 92 | 6.41 | 0.67 | 17.5 | 41.5 | 21.5 | 24.75 | 31.5 | 39 |
| | | 7754 | 990 | 6.70 | 0.21 | 17 | 40.5 | 21 | 25.5 | 34 | 37 |
| | | 7788 | 591 | 6.89 | 0.28 | 18 | 46.5 | 23 | 26.5 | 33.5 | 42 |
| Brood | 3 | 6431 | 990 | 11.41 | 0.36 | 14.5 | 55 | 20 | 27 | 40 | 51 |
| | | 7749 | 1072 | 11.38 | 0.35 | 17 | 56 | 21.5 | 26 | 43.5 | 50 |
| | | 7754 | 920 | 10.61 | 0.35 | 17.5 | 54.5 | 21.5 | 28 | 42.25 | 48.5 |
| | | 7788 | 590 | 10.15 | 0.42 | 18.5 | 59.5 | 23 | 27 | 39 | 50 |
| Random | | 6431 | 990 | 8.13 | 0.26 | 17 | 48 | 21.5 | 26 | 37 | 41.5 |
| | | 7749 | 1072 | 6.40 | 0.2 | 19 | 48.5 | 23 | 26.5 | 32 | 42 |
| | | 7754 | 920 | 8.00 | 0.26 | 16.5 | 45.5 | 21 | 26 | 36.5 | 41 |
| | | 7788 | 554 | 10.76 | 0.46 | 19 | 58 | 23 | 27.5 | 41 | 53.5 |
| Brood | 4 | 7754 | 704 | 10.55 | 0.4 | 15 | 51 | 20.5 | 27.25 | 41.5 | 46.5 |
| | | 7788 | 590 | 9.77 | 0.4 | 18.5 | 58.5 | 23.5 | 27.5 | 39 | 49 |
| Random | | 7754 | 774 | 7.84 | 0.28 | 17 | 47 | 21 | 26 | 35.5 | 42 |
| | | 7788 | 1182 | 9.24 | 0.27 | 17.5 | 58 | 22.5 | 26.75 | 35 | 49 |
| Brood | 5 | 7754 | 200 | 14.14 | 1 | 14.5 | 54.5 | 18 | 24.5 | 46.5 | 52.5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Random | 7754 | 200 | 8.92 | 0.63 | 18 | 44 | 20.5 | 26.25 | 38.5 | 42.5 |

***Table 18. Summary Statistics for Temperatures at Scaled Quail (Callipepla squamata) Brood Sites (n=24) (April 1 – August 15) 2020 in the Southern High Plains of Texas***

| | | Categories | | | | | Temperature | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Point Location | Band Number | N | Mean | Standard Error | Minimum | Maximum | 25th Quantile | 50th Quantile | 75th Quantile | 95th Quantile |
| Brood Site | 5781 | 1020 | 7.81 | 0.24 | 17.5 | 54 | 22.5 | 27 | 34 | 43.75 |
| | 6431 | 3134 | 7.02 | 0.13 | 17 | 48 | 21.5 | 25 | 33.5 | 40 |
| | 6433 | 990 | 6.77 | 0.22 | 16.5 | 42 | 21.5 | 27.5 | 35 | 38.5 |
| | 6434 | 990 | 8.06 | 0.26 | 15 | 46 | 20.5 | 25 | 35.5 | 41 |
| | 6514 | 2040 | 9.05 | 0.2 | 17 | 57.5 | 22.5 | 27 | 36.5 | 47.5 |
| | 6541 | 990 | 5.45 | 0.17 | 16.5 | 37 | 21 | 25 | 31.5 | 34.5 |
| | 7749 | 1256 | 6.4 | 0.18 | 17.5 | 48.5 | 23 | 26 | 32 | 41 |
| | 7754 | 3874 | 7.32 | 0.12 | 16.5 | 47 | 21 | 26 | 34.5 | 40 |
| | 7758 | 1020 | 7.73 | 0.24 | 17 | 50 | 22.5 | 27 | 35 | 44 |
| | 7767 | 92 | 4.84 | 0.5 | 19 | 38 | 22.5 | 25 | 30.25 | 35.5 |
| | 7772 | 92 | 6.69 | 0.7 | 18 | 41.5 | 23 | 26.75 | 35.25 | 40.5 |
| | 7788 | 2918 | 8.79 | 0.16 | 17.5 | 58 | 23 | 27 | 35 | 47.5 |
| Random | 5781 | 510 | 12.24 | 0.54 | 17 | 62.5 | 22 | 28 | 43.5 | 55 |
| | 6431 | 2598 | 10.8 | 0.21 | 14.5 | 61 | 22 | 28 | 40 | 50.5 |
| | 6433 | 990 | 9.65 | 0.31 | 16.5 | 55.5 | 22 | 27.5 | 37.5 | 48 |
| | 6434 | 990 | 11.29 | 0.36 | 15.5 | 53.5 | 20.5 | 26.5 | 40.5 | 49.5 |
| | 6514 | 2040 | 10.53 | 0.23 | 17.5 | 59 | 24 | 29.5 | 40.5 | 53 |
| | 6541 | 990 | 11.68 | 0.37 | 15 | 55.5 | 20.5 | 25.5 | 42.5 | 50 |
| | 7749 | 1256 | 11.09 | 0.31 | 17 | 56 | 21.5 | 26.5 | 42.5 | 49.5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 7754 | 3804 | 11.27 | 0.18 | 14.5 | 56 | 21 | 26.5 | 42.5 | 49.5 |
| | 7758 | 1020 | 9.98 | 0.31 | 18.5 | 58 | 24.5 | 30 | 40.5 | 52 |
| | 7767 | 92 | 9.81 | 1.02 | 21.5 | 52.5 | 24 | 26.75 | 40 | 51.5 |
| | 7772 | 92 | 8.79 | 0.92 | 19.5 | 51.5 | 24.5 | 26.75 | 37.25 | 49.5 |
| | 7788 | 2917 | 10.54 | 0.2 | 18 | 61.5 | 22.5 | 27.5 | 39.5 | 53 |

***Table 19. Scaled Quail (Callipepla squamata) Brood Site (n=24) Empirical Distribution Function Output of Proportional Temperature Data from 2020 (April 1 – August 15) Among Checks (5) in the Southern High Plains of Texas***

| | | | | | | | Percentage of observations | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Assessment | Pairwise | KS | Ks[a] | K | MD | Brood | Random |
| Temperature | Check 1 | Used-Random | 0.10 | 12.99 | 0.19 | 40°C | 94% | 75% |
| | Check 2 | Used-Random | 0.10 | 8.34 | 0.2 | 38°C | 90% | 69% |
| | Check 3 | Used-Random | 0.09 | 7.28 | 0.17 | 42.5°C | 94% | 77% |
| | Check 4 | Used-Random | 0.06 | 3.52 | 0.13 | 39°C | 86% | 73% |
| | Check 5 | Used-Random | 0.15 | 3 | 0.3 | 43.5°C | 99% | 69% |
| | Among Checks | Used-Random | 0.09 | 16.7 | 0.18 | 40°C | 92% | 74% |

*Table 20. Visual Obstruction Measurements of Vegetation at Scaled Quail (Callipepla squamata) Brood Sites (n=26) and Paired Random Locations in the Southern High Plains of Texas*

| Bird-ID | Grass VOR N 100% | Grass VOR N 75% | Grass VOR N 50% | Grass VOR N 25% | Grass VOR N 0% | Grass VOR E 100% | Grass VOR E 75% | Grass VOR E 50% | Grass VOR E 25% | Grass VOR E 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 7758 | 1,2 | 3 | 0 | 0 | 4-15 | 0 | 0 | 0 | 1-5 | 6-15 |
| 7758 | 1,2 | 3 | 4-7 | 0 | 8-15 | 1 | 2,3 | 4 | 5,9,10 | 6-8,11-15 |
| 6514 | 1-3 | 0 | 0 | 4-9 | 10-15 | 1 | 2 | 0 | 0 | 3-15 |
| 6514 | 1 | 0 | 2 | 3-5,14 | 6-13,15 | 1 | 0 | 2,3 | 4-7 | 8-15 |
| 6514 | 0 | 0 | 0 | 1 | 2-15 | 0 | 0 | 0 | 1 | 2-15 |
| 6514 | 1 | 0 | 2 | 3,4,11 | 0 | 1 | 0 | 0 | 2-15 | 0 |
| 5781 | 1-3 | 0 | 0 | 4,5 | 6-15 | 0 | 1 | 0 | 2-4 | 5-15 |
| 5781 | 0 | 1 | 2,3 | 4-9 | 10-15 | 0 | 1 | 0 | 2,3 | 4-15 |
| 5781 | 0 | 0 | 0 | 1 | 2-15 | N/A | N/A | N/A | N/A | N/A |
| 5781 | 0 | 0 | 0 | 1 | 2-15 | 0 | 1 | 0 | 2 | 3-15 |
| 7788 | 0 | 1 | 0 | 2 | 3-15 | 1 | 0 | 0 | 2,3 | 4-15 |
| 7788 | 0 | 0 | 1 | 2 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 7788 | 0 | 1 | 0 | 2 | 3-15 | 0 | 0 | 0 | 1,5,6 | 2-4,7-15 |
| 7788 | 0 | 0 | 1 | 2 | 3-15 | 0 | 0 | 1 | 2 | 3-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 1-9 | 10-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7788 | 0 | 0 | 0 | 1,2 | 3-15 | 0 | 3 | 0 | 1,2,4 | 5-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 1 | 0 | 0 | 2-6 | 7-15 | 0 | 0 | 1 | 2-7 | 8-15 |
| 7788 | N/A | N/A | N/A | N/A | N/A | 1 | 0 | 0 | 2 | 3-15 |
| 7788 | 1 | 0 | 0 | 2-4,12 | 5-11,13-15 | 1 | 0 | 0 | 2,5 | 3,4,6-15 |
| 7749 | 1 | 2,3 | 0 | 4-6 | 7-15 | 1 | 2,3 | 0 | 4-6 | 7-15 |
| 7749 | 1 | 0 | 2 | 3-6,8 | 7,9-15 | 1,2 | 3 | 0 | 4-6 | 7-15 |
| 7749 | 1 | 0 | 0 | 2-7 | 8-15 | 1 | 0 | 2,3 | 4,5 | 6-15 |
| 7749 | 1,2 | 0 | 3 | 4 | 5-15 | 0 | 1 | 2 | 3,4 | 5-15 |
| 7749 | 1,2 | 3 | 0 | 0 | 4-15 | 1,2 | 3,4 | 0 | 0 | 5-15 |
| 7749 | 1 | 0 | 0 | 2,3 | 4-15 | 1 | 2 | 0 | 3-10 | 11-15 |
| 7772 | 1 | 2 | 3 | 4,5 | 6-15 | 0 | 1 | 0 | 2-5 | 6-15 |
| 7772 | 1 | 0 | 0 | 2,3 | 4-15 | 1 | 2,3 | 4 | 5,6 | 7-15 |
| 7767 | 1 | 0 | 2 | 0 | 3-15 | 1-2 | 0 | 3-5 | 0 | 6-15 |
| 7767 | 1 | 0 | 2 | 3-5 | 6-15 | 1,2 | 3 | 0 | 4,5,7-9 | 6,10-15 |
| 6431 | 1 | 0 | 0 | 2 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 6431 | 1 | 0 | 2,3 | 4-9 | 10-15 | 1 | 0 | 2 | 0 | 3-15 |
| 6431 | 1,2 | 3 | 0 | 0 | 4-15 | 1 | 0 | 0 | 2 | 3-15 |
| 6431 | 0 | 0 | 1 | 2 | 3-15 | 1 | 2 | 0 | 3-5 | 6-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6431 | 0 | 0 | 0 | 1 | 2-15 | 0 | 0 | 0 | 1 | 2-15 |
| 6431 | 0 | 1 | 0 | 2-4 | 5-15 | 1 | 0 | 2 | 3,4 | 5-15 |
| 6431 | 0 | 0 | 0 | 0 | 1-15 | 1,2 | 3,6,7 | 4,5 | 0 | 8-15 |
| 6431 | 0 | 1 | 2,3 | 4,5 | 6-15 | 1 | 2,3 | 0 | 4-8 | 6,7,9-15 |
| 6541 | 1 | 0 | 2 | 3-9 | 10-15 | 0 | 1 | 2,3 | 4-7 | 8-15 |
| 6541 | 1,2 | 3 | 0 | 4 | 5-15 | 1,2,4 | 5 | 3,6 | 7-9 | 10-15 |
| 6433 | 1 | 0 | 0 | 2 | 3-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6433 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6434 | 1-4 | 5 | 6 | 7-11,13 | 14,15 | 1-5 | 6 | 0 | 0 | 7-15 |
| 6434 | 1 | 2,3 | 0 | 4,5,11,15 | 6-10,12-14 | 1 | 2 | 3 | 4-7 | 8-15 |
| 7754 | 1 | 2 | 0 | 3 | 4-15 | 0 | 1 | 0 | 2 | 3-15 |
| 7754 | 1 | 0 | 2 | 3-5 | 6-15 | 1 | 2 | 3 | 4,5 | 6-15 |
| 7754 | 0 | 1 | 2 | 0 | 3-15 | 1,2 | 3 | 0 | 4 | 5-15 |
| 7754 | 1 | 0 | 0 | 2,4,6 | 3,5,7-15 | 1,2 | 3 | 4 | 5-11 | 12-15 |
| 7754 | 1 | 2 | 0 | 0 | 3-15 | 1 | 2 | 0 | 3 | 4-15 |
| 7754 | 1 | 2,3 | 4 | 5,6 | 7-15 | 1 | 2,3 | 0 | 4-6,12 | 7-11,13-15 |
| 7754 | 1 | 2 | 3 | 0 | 4-15 | 1 | 2 | 0 | 0 | 3-15 |
| 7754 | 0 | 0 | 0 | 1 | 2-15 | 1 | 0 | 2 | 3-5 | 6-15 |

| | Grass VOR S 100% | Grass VOR S 75% | Grass VOR S 50% | Grass VOR S 25% | Grass VOR S 0% | Grass VOR W 100% | Grass VOR W 75% | Grass VOR W 50% | Grass VOR W 25% | Grass VOR W 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 7758 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 2-15 |
| 7758 | 1 | 0 | 2 | 3 | 4-15 | 1 | 2,3 | 0 | 4,5 | 6-15 |
| 6514 | 1-3 | 4,5 | 0 | 6-8 | 9-15 | 1-3 | 4,5 | 0 | 6-8 | 9-15 |
| 6514 | 0 | 1 | 2 | 3,4,6,12,14 | 5,7-11,15 | 1 | 2 | 3 | 0 | 4-15 |
| 6514 | 1 | 0 | 0 | 2-5 | 6-15 | 0 | 0 | 0 | 3 | 1,2,4-15 |
| 6514 | 1 | 2,3 | 4 | 5-15 | 0 | 0 | 1 | 0 | 2-9 | 10-15 |
| 5781 | 1 | 0 | 0 | 2 | 3-15 | 0 | 1 | 0 | 2-8 | 9-15 |
| 5781 | 1 | 0 | 2 | 3-6,9 | 7,8,10-15 | 1,2 | 0 | 3 | 4,6-8 | 5,9-15 |
| 5781 | N/A | N/A | N/A | N/A | N/A | 0 | 0 | 0 | 1-5 | 6-15 |
| 5781 | 0 | 1 | 0 | 2 | 3-15 | 0 | 0 | 1,2 | 3 | 4-15 |
| 7788 | 1 | 2 | 0 | 0 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 7788 | 0 | 1 | 0 | 2-4 | 5-15 | 1 | 0 | 0 | 2-5,10-15 | 6-9 |
| 7788 | 0 | 0 | 0 | 1 | 2-15 | 0 | 0 | 0 | 1 | 2-15 |
| 7788 | 0 | 1 | 0 | 2 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 7788 | 0 | 3 | 0 | 1,2,5,7,8 | 3,4,6,9-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 0 | 0 | 2,3 | 1 | 4-15 | 0 | 0 | 0 | 0 | 1-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 0 | 0 | 1 | 2,3 | 4-15 | 0 | 0 | 1,2 | 3,4 | 5-15 |
| 7788 | 0 | 1,2 | 0 | 3-7 | 8-15 | N/A | N/A | N/A | N/A | N/A |
| 7788 | 1 | 2,3 | 0 | 4 | 5-15 | 0 | 0 | 1 | 2 | 3-15 |
| 7749 | 1 | 2 | 3 | 4-6,13 | 7-12,14,15 | 1,2 | 0 | 3 | 4-7 | 8-15 |
| 7749 | 1 | 2 | 0 | 3 | 4-15 | 0 | 1,2 | 0 | 3-5,7,8 | 6,9-15 |
| 7749 | 1,2 | 0 | 3 | 4-6 | 7-15 | 1 | 0 | 0 | 2-8 | 9-15 |
| 7749 | 1,2 | 3,4 | 5-7 | 8-15 | 0 | 0 | 1 | 0 | 2-4,8 | 5-7,9-15 |
| 7749 | 1,2 | 3 | 0 | 4-7 | 8-15 | 1,2 | 3 | 0 | 4,5 | 6-15 |
| 7749 | 0 | 1 | 0 | 2-4 | 5-15 | 0 | 1 | 0 | 2,3 | 4-15 |
| 7772 | 1 | 0 | 2 | 3 | 4-15 | 1 | 2 | 3 | 4 | 5-15 |
| 7772 | 1 | 0 | 2 | 3-7 | 8-15 | 1-3 | 4 | 0 | 5,6 | 7-15 |
| 7767 | 1 | 2,3 | 0 | 4,5 | 6-15 | 1 | 2 | 3 | 0 | 4-15 |
| 7767 | 1,2 | 3 | 0 | 4,5,7-10 | 6,11-15 | 0 | 1 | 0 | 2,3 | 4-15 |
| 6431 | 1,2 | 3 | 0 | 4 | 5-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6431 | 0 | 1 | 0 | 2,3 | 4-15 | 1 | 0 | 0 | 2,3 | 4-15 |
| 6431 | 1 | 0 | 0 | 2 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 6431 | 0 | 0 | 1 | 0 | 2-15 | 0 | 0 | 0 | 1 | 2-15 |
| 6431 | 0 | 0 | 0 | 1 | 2-15 | 0 | 0 | 0 | 1 | 2-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6431 | 1 | 0 | 0 | 2,3 | 4-15 | 0 | 0 | 1 | 0 | 2-15 |
| 6431 | 1,2 | 3 | 0 | 4-6 | 7-15 | 1,2 | 3,4 | 0 | 5-8 | 9-15 |
| 6431 | 1,2 | 3 | 4,5 | 6-13 | 14,15 | 1,2 | 0 | 3 | 4,6,13 | 5,7-12,14,15 |
| 6541 | 1 | 2,3 | 4 | 5-10 | 11-15 | 0 | 1,2 | 3 | 4-9,11 | 10,12-15 |
| 6541 | 0 | 0 | 1 | 2,8,9 | 3-7,10-15 | 1 | 2 | 0 | 3 | 4-15 |
| 6433 | 0 | 1-3 | 0 | 0 | 4-15 | 1 | 0 | 0 | 2,4,8-13 | 3,5-7,14,15 |
| 6433 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 1 | 2,3 | 4-15 |
| 6434 | 1-6 | 0 | 0 | 7-15 | 0 | 1-3 | 0 | 4 | 5 | 6-15 |
| 6434 | 1,2 | 3 | 0 | 4-7 | 8-15 | 1,2 | 3,4 | 5 | 6-8 | 9-15 |
| 7754 | 0 | 1 | 0 | 2 | 3-15 | 0 | 1 | 0 | 2 | 3-15 |
| 7754 | 1-3 | 4,5 | 6-8 | 9-15 | 0 | 1 | 0 | 2 | 3-5 | 6-15 |
| 7754 | 1,2 | 3 | 0 | 4 | 5-15 | 1,2 | 3 | 0 | 4 | 5-15 |
| 7754 | 1 | 2,3 | 0 | 4,6,9-13 | 7,8,14,15 | 1,2 | 3 | 4 | 5-10 | 11-15 |
| 7754 | 1 | 0 | 2 | 3,4 | 5-15 | 1 | 2 | 0 | 0 | 3-15 |
| 7754 | 1 | 0 | 2,3 | 4-15 | 0 | 1,2 | 0 | 3 | 4-6,11,14 | 7-10,12,13,15 |
| 7754 | 1 | 2 | 3 | 4 | 5-15 | 0 | 1 | 0 | 2 | 3-15 |
| 7754 | 1 | 0 | 0 | 2,3 | 4-15 | 1 | 0 | 0 | 2-7 | 8-15 |

| | Shrub VOR N 100% | Shrub VOR N 75% | Shrub VOR N 50% | Shrub VOR N 25% | Shrub VOR N 0% | Shrub VOR E 100% | Shrub VOR E 75% | Shrub VOR E 50% | Shrub VOR E 25% | Shrub VOR E 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 7758 | 1,2,15 | 7,10,12,13 | 0 | 4,6,8,9,11,14 | 5 | 1-15 | 0 | 0 | 0 | 0 |
| 7758 | 0 | 0 | 0 | 0 | 1-15 | 0 | 1 | 2-4 | 8,9 | 5-7,10-15 |
| 6514 | 9-15 | 5,6 | 0 | 8 | 1-4,7 | 1-15 | 0 | 0 | 0 | 0 |
| 6514 | 0 | 0 | 2 | 0 | 1,3-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6514 | 1-15 | 0 | 0 | 0 | 0 | 1 | 5,8,12,13 | 2 | 3 | 4,6,7,9,10,14,15 |
| 6514 | 0 | 0 | 0 | 0 | 1-15 | 1,2 | 3 | 0 | 4 | 5-15 |
| 5781 | 0 | 8 | 0 | 4,5,7,11 | 1-3,6,9,10,12-15 | 3,5 | 2,4 | 6,7 | 8 | 1,9-15 |
| 5781 | 0 | 1 | 0 | 0 | 2-15 | 0 | 1 | 0 | 0 | 2-15 |
| 5781 | 8-15 | 0 | 0 | 7 | 1,2 | 1,2,5-11 | 3,4 | 0 | 12,15 | 13,14 |
| 5781 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 3 | 2,4-8,11 | 1,9,12-15 |
| 7788 | 1-4,6,9-11 | 12-14 | 5,7,8,15 | 0 | 0 | 10 | 9,11 | 3,4 | 12 | 1,2,5-8,13-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 1-3 | 0 | 0 | 4-8,10 | 9,11-15 | 1-3 | 4 | 0 | 5 | 6-15 |
| 7788 | 0 | 0 | 0 | 3-5 | 1,2,6-15 | 0 | 0 | 1-3 | 4,5 | 6-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7788 | 1,3 | 2,4 | 0 | 5,13 | 6-12,14,15 | 1 | 2,7-11 | 0 | 3,5,6,12 | 4,14,15 |
| 7788 | 0 | 0 | 0 | 2,4-6,14 | 1,3,7-13,15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | N/A | N/A | N/A | N/A | N/A | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7749 | 5 | 4,7 | 8 | 6,10 | 1-3,11-15 | 1-3,7-12 | 6,15 | 4,13 | 5,14 | 0 |
| 7749 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7749 | 1-4,6,9-15 | 5,7 | 0 | 8 | 0 | 1-4,7-10 | 0 | 5,6 | 11 | 12-15 |
| 7749 | 0 | 0 | 0 | 0 | 1-15 | 0 | 12 | 9-11,13-15 | 0 | 1-8 |
| 7749 | 0 | 0 | 0 | 0 | 1-15 | 4 | 0 | 5 | 3,12-15 | 1,2,6-11 |
| 7749 | 1-3 | 0 | 4 | 5 | 6-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7772 | 1 | 4,5 | 2,6,7 | 0 | 3,8-15 | 1-5 | 6 | 7 | 0 | 8-15 |
| 7772 | 1,2 | 3 | 4 | 5,6 | 7-15 | 1 | 2,3 | 0 | 4 | 5-15 |
| 7767 | 1,2 | 3 | 4,5 | 0 | 6-15 | 5,8,9 | 3,4,7,13,14 | 0 | 6,10,12,15 | 1,2,11 |
| 7767 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 1 | 0 | 2-15 |
| 6431 | 0 | 5,7,11,12 | 0 | 8,15 | 1-4,6,9,10,13,14 | 1-15 | 0 | 0 | 0 | 0 |
| 6431 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6431 | 1-3,8,11,13,15 | 0 | 0 | 4-7,9,10,12,14 | 0 | 1-15 | 0 | 0 | 0 | 0 |
| 6431 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6431 | 1-15 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6431 | 0 | 0 | 0 | 5,6 | 1-4,7-15 | 5-7 | 8,9,15 | 4,10-14 | 0 | 1-3 |
| 6431 | 1-7 | 8,11-13 | 0 | 10,14,15 | 9 | 1-5 | 11,12 | 0 | 6,7,10,13-15 | 8,9 |
| 6431 | 9-11 | 1-8,12-15 | 0 | 0 | 0 | 1 | 2 | 3 | 4,5 | 6-15 |
| 6541 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6541 | 0 | 9 | 0 | 10 | 1-8,11-15 | 1,9 | 2,7,8 | 11,12 | 6,10,13 | 3-5,14,15 |
| 6433 | 5-15 | 0 | 3,4 | 0 | 1,2 | 1-15 | 0 | 0 | 0 | 0 |
| 6433 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6434 | 0 | 0 | 0 | 3,4,6,7,9-12 | 1-2,5 | 1-9,13 | 10-12,14 | 0 | 0 | 0 |
| 6434 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 1-3,7-9,13,15 | 4-6,10-12,14 | 0 | 0 | 0 | 0 | 4-15 | 0 | 3 | 1,2 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 1,2,12-15 | 7 | 3,11 | 4,6 | 5,8-10 | 7,11,15 | 6,8-10,12-14 | 0 | 3-5 | 1,2 |
| 7754 | 1 | 2 | 3 | 4-7 | 8-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 1-15 | 0 | 0 | 0 | 0 | 1-9,15 | 10-14 | 0 | 0 | 0 |
| 7754 | 0 | 0 | 0 | 2,3,6-12 | 1,4,5,13-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 7,1-5 | 8,6 | 13 | 9,14 | 10-12,15 | 1-15 | 0 | 0 | 0 | 0 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |

| | Shrub VOR S 100% | Shrub VOR S 75% | Shrub VOR S 50% | Shrub VOR S 25% | Shrub VOR S 0% | Shrub VOR W 100% | Shrub VOR W 75% | Shrub VOR W 50% | Shrub VOR W 25% | Shrub VOR W 0% |
|---|---|---|---|---|---|---|---|---|---|---|
| 7758 | 0 | 5,6 | 0 | 3,4,7-15 | 1,2 | 1-15 | 0 | 0 | 0 | 0 |
| 7758 | 1 | 0 | 0 | 2 | 3-15 | 1,2 | 8,9,11 | 3,4,10 | 6,7,12-15 | 5 |
| 6514 | 0 | 13,15 | 3,14 | 10-12 | 1,2,4-9 | 0 | 0 | 0 | 0 | 1-15 |
| 6514 | 0 | 0 | 0 | 0 | 1-15 | 0 | 1,2 | 3,4 | 5 | 6-15 |
| 6514 | 13 | 0 | 0 | 10,12,14,15 | 1-9,11 | 1 | 2,3 | 0 | 8,12 | 4-7,9-11,13-15 |
| 6514 | 0 | 1,2 | 3,4 | 5,6 | 7-15 | 0 | 1 | 0 | 0 | 2-15 |
| 5781 | 1-10,13,15 | 12,14 | 0 | 11 | 0 | 0 | 13,15 | 0 | 3,4,14 | 1,2,5-12 |
| 5781 | 1 | 0 | 2 | 0 | 3-15 | 0 | 0 | 0 | 1 | 2-15 |
| 5781 | 1-6 | 7-11 | 0 | 12 | 13-15 | 1-7 | 10,11 | 0 | 8,9,15 | 12-14 |
| 5781 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 6-15 | 1-5 |
| 7788 | 15 | 9,10,14 | 11 | 4,5,8,12,13 | 1-3,6,7 | 1-3,7,8 | 9-11 | 6 | 4,12,15 | 5,13,14 |
| 7788 | 0 | 0 | 0 | 1-3 | 4-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 1-5 | 6,7 | 0 | 8 | 9-15 | 1-7 | 8 | 0 | 0 | 9-15 |
| 7788 | 0 | 4-6 | 0 | 3 | 1,2,7-15 | 0 | 0 | 1-15 | 0 | 0 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 7788 | 1-11 | 0 | 0 | 12-15 | 0 | 1-15 | 0 | 0 | 0 | 0 |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7788 | 0 | 0 | 0 | 2,3 | 1,4-15 | N/A | N/A | N/A | N/A | N/A |
| 7788 | 0 | 0 | 0 | 0 | 1-15 | 0 | 3,4 | 0 | 1,2,5-10 | 11-15 |
| 7749 | 5,11 | 6,7 | 4,8,9,12 | 10,13,14 | 1-3,15 | 0 | 8 | 0 | 7,9 | 1-6,10-15 |
| 7749 | 0 | 0 | 0 | 5 | 1-4,6-15 | 1,2 | 3-5 | 0 | 6-15 | 0 |
| 7749 | 0 | 9-11 | 0 | 7,8 | 1-6,12-15 | 1,4 | 3 | 5 | 2,6,7 | 8-15 |
| 7749 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7749 | 0 | 0 | 0 | 0 | 1-15 | 0 | 13,14 | 8-10 | 4,7,11,12 | 1-3,5,6,15 |
| 7749 | 0 | 0 | 0 | 1 | 2-15 | 1 | 2,3 | 0 | 4-10 | 11-15 |
| 7772 | 3 | 2 | 0 | 1,4 | 5-15 | 1-3 | 0 | 0 | 4 | 5-15 |
| 7772 | 0 | 0 | 0 | 0 | 1-15 | 1-3 | 4 | 5 | 6,7 | 8-15 |
| 7767 | 5-7 | 0 | 4,8-10 | 3,11,12 | 1,2,13-15 | 1 | 2,3 | 4,5 | 9,10 | 11-15 |
| 7767 | 0 | 0 | 0 | 1-5 | 6-15 | 0 | 0 | 1 | 2 | 3-15 |
| 6431 | 1,2,6,11,13 | 3,7,9 | 14,15 | 5,8,10,12 | 0 | 8,12,13 | 10,14 | 7 | 9 | 1-6,11,15 |
| 6431 | 3,4,15 | 0 | 0 | 2,5,6,12-14 | 1,7-11 | 0 | 0 | 0 | 0 | 10-15 |
| 6431 | 1-3,7-15 | 4,6 | 0 | 0 | 5 | 0 | 0 | 0 | 7-8,10,11,13 | 1-6,9,12 |
| 6431 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6431 | 1-15 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6431 | 4-6 | 7-15 | 0 | 3 | 1,2 | 0 | 0 | 11-13 | 14 | 1-10,15 |
| 6431 | 1-5 | 0 | 6,7 | 8,14,15 | 9-13 | 1-5 | 7,8 | 6 | 0 | 9-15 |
| 6431 | 0 | 0 | 0 | 3,4 | 1,2,5-15 | 0 | 0 | 0 | 0 | 1-15 |
| 6541 | 0 | 0 | 2,15 | 5,14 | 1,3,4,6-13 | 0 | 0 | 0 | 0 | 1-15 |
| 6541 | 1-4,6 | 5 | 0 | 0 | 7-15 | 1-5,13-15 | 6-10 | 0 | 0 | 0 |
| 6433 | 0 | 4,14,15 | 12,13 | 3,6-8 | 1-3,5,9-11 | 1,13,15 | 2-8,11,12,14 | 0 | 0 | 9,10 |
| 6433 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 1,3-7,11 | 2,8,9,12-15 |
| 6434 | 1-11 | 12-15 | 0 | 0 | 0 | 0 | 12 | 11 | 10 | 1-9,13-15 |
| 6434 | 0 | 0 | 0 | 1 | 2-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 5-9 | 10-14 | 0 | 3,4 | 1,2,15 | 1-15 | 0 | 0 | 0 | 0 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 3,5-11 | 4,13-15 | 12 | 1,2 |
| 7754 | 1,2,9-15 | 6-8 | 0 | 3-5 | 0 | 1-5,11,12 | 6 | 9 | 7,8,10,13-15 | 0 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 0 | 0 | 15 | 2,3,8-14 | 1,4-7 | 1-6 | 7-15 | 0 | 0 | 0 |
| 7754 | 0 | 1-5 | 0 | 9 | 6-8,10-15 | 0 | 0 | 0 | 0 | 1-15 |
| 7754 | 5,7 | 6-15 | 4 | 3 | 1,2 | 0 | 0 | 0 | 1-5,15 | 6-14 |
| 7754 | 0 | 0 | 0 | 0 | 1-15 | 0 | 0 | 0 | 0 | 1-15 |

*Table 21. Ground Cover Measurements from Scaled Quail (Callipepla squamata) Brood Sites (n=26) and Pared Random Location in the Southern High Plains of Texas*

| Bird-ID | Litter % Center | Grass % Center | Forbs % Center | Bare % Center | Shrubs % Center | Litter Depth (cm) | Tallest Plant (cm) | Exotic |
|---|---|---|---|---|---|---|---|---|
| 7758 | 15 | 10 | 5 | 15 | 0 | 0.20 | 198.20 | 55 |
| 7758 | 15 | 35 | 20 | 30 | 0 | 0.10 | 23.50 | 0 |
| 6514 | 35 | 0 | 10 | 15 | 40 | 3.50 | 243.80 | 0 |
| 6514 | 10 | 50 | 5 | 30 | 5 | 2.50 | 39.00 | 0 |
| 6514 | 25 | 5 | 0 | 30 | 40 | 9.00 | 183.00 | 0 |
| 6514 | 40 | 30 | 10 | 5 | 15 | 1.50 | 32.50 | 0 |
| 5781 | 10 | 5 | 0 | 30 | 55 | 21.00 | 94.00 | 0 |
| 5781 | 25 | 25 | 20 | 5 | 25 | 0.20 | 36.00 | 0 |
| 5781 | 20 | 0 | 0 | 0 | 0 | 0.40 | 152.40 | 80 |
| 5781 | 35 | 35 | 10 | 30 | 0 | 0.20 | 18.00 | 0 |
| 7788 | 35 | 0 | 0 | 0 | 65 | 8.00 | 198.20 | 0 |
| 7788 | 15 | 40 | 25 | 20 | 0 | 1.00 | 29.50 | 0 |
| 7788 | 15 | 5 | 0 | 0 | 80 | 5.00 | 105.00 | 0 |
| 7788 | 10 | 20 | 15 | 50 | 5 | 0.20 | 26.50 | 0 |
| 7788 | 100 | 0 | 0 | 0 | 0 | 9.50 | 0.00 | 0 |
| 7788 | 15 | 0 | 5 | 80 | 0 | 1.50 | 4.50 | 0 |
| 7788 | 20 | 0 | 0 | 5 | 0 | 29.00 | 118.00 | 75 |
| 7788 | 5 | 25 | 5 | 65 | 0 | 0.20 | 30.20 | 0 |
| 7788 | 10 | 5 | 15 | 70 | 0 | 4.50 | 41.00 | 0 |
| 7788 | 5 | 10 | 5 | 80 | 0 | 3.00 | 18.50 | 0 |
| 7749 | 10 | 5 | 10 | 0 | 75 | 2.00 | 182.80 | 0 |
| 7749 | 45 | 35 | 5 | 15 | 0 | 2.00 | 48.00 | 0 |
| 7749 | 20 | 0 | 5 | 0 | 75 | 9.00 | 165.10 | 0 |
| 7749 | 25 | 40 | 25 | 10 | 0 | 1.00 | 92.50 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7749 | 40 | 10 | 35 | 5 | 0 | 15.00 | 60.50 | 10 |
| 7749 | 25 | 15 | 30 | 35 | 0 | 2.50 | 28.00 | 0 |
| 7772 | 10 | 30 | 0 | 0 | 60 | 1.00 | 72.00 | 0 |
| 7772 | 20 | 55 | 15 | 10 | 0 | 2.00 | 50.00 | 0 |
| 7767 | 30 | 5 | 0 | 0 | 65 | 7.50 | 89.00 | 0 |
| 7767 | 20 | 45 | 10 | 10 | 15 | 4.00 | 59.00 | 0 |
| 6431 | 65 | 0 | 10 | 25 | 0 | 15.00 | 23.00 | 0 |
| 6431 | 15 | 25 | 0 | 55 | 5 | 0.50 | 12.60 | 0 |
| 6431 | 35 | 10 | 0 | 25 | 0 | 1.00 | 259.10 | 30 |
| 6431 | 5 | 25 | 0 | 70 | 0 | 0.50 | 12.00 | 0 |
| 6431 | 0 | 0 | 0 | 0 | 100 | 0.00 | 121.90 | 0 |
| 6431 | 55 | 40 | 0 | 5 | 0 | 2.50 | 23.00 | 0 |
| 6431 | 15 | 0 | 0 | 5 | 80 | 16.00 | 67.00 | 0 |
| 6431 | 35 | 20 | 15 | 30 | 0 | 3.50 | 73.00 | 0 |
| 6541 | 25 | 60 | 10 | 5 | 0 | 1.00 | 36.00 | 0 |
| 6541 | 30 | 10 | 5 | 25 | 30 | 24.00 | 78.00 | 0 |
| 6433 | 55 | 5 | 0 | 40 | 0 | 3.00 | 41.00 | 0 |
| 6433 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |
| 6434 | 55 | 0 | 5 | 5 | 0 | 45.00 | 47.00 | 35 |
| 6434 | 15 | 45 | 10 | 35 | 0 | 1.00 | 72.00 | 0 |
| 7754 | 40 | 0 | 0 | 0 | 0 | 4.00 | 182.80 | 60 |
| 7754 | 60 | 40 | 0 | 0 | 0 | 1.50 | 22.00 | 0 |
| 7754 | 35 | 20 | 0 | 5 | 0 | 7.00 | 29.00 | 40 |
| 7754 | 20 | 60 | 5 | 10 | 15 | 1.00 | 91.00 | 0 |
| 7754 | 20 | 20 | 0 | 15 | 0 | 2.00 | 156.00 | 45 |
| 7754 | 10 | 85 | 5 | 0 | 0 | 1.00 | 63.00 | 0 |
| 7754 | 45 | 10 | 0 | 0 | 45 | 5.00 | 152.40 | 0 |
| 7754 | 15 | 40 | 0 | 45 | 0 | 3.00 | 36.00 | 0 |

| Bird-ID | Litter % 1m N | Grass % 1m N | Forbs % 1m N | Bare % 1m N | Shrubs % 1m N | Litter Depth (cm) 1m N | Tallest Plant (cm) 1m N | Exotic 1m N |
|---|---|---|---|---|---|---|---|---|
| 7758 | 5 | 0 | 10 | 15 | 0 | 8.00 | 64.00 | 20 |
| 7758 | 10 | 30 | 25 | 35 | 0 | 0.20 | 33.00 | 0 |
| 6514 | 20 | 0 | 0 | 0 | 80 | 52.00 | 228.60 | 0 |
| 6514 | 40 | 45 | 5 | 0 | 10 | 2.00 | 51.00 | 0 |
| 6514 | 15 | 0 | 0 | 5 | 80 | 9.00 | 243.80 | 0 |
| 6514 | 15 | 55 | 15 | 15 | 0 | 1.50 | 25.00 | 0 |
| 5781 | 40 | 25 | 0 | 35 | 0 | 9.00 | 10.00 | 0 |
| 5781 | 45 | 30 | 15 | 0 | 10 | 2.50 | 35.50 | 0 |
| 5781 | 0 | 0 | 0 | 0 | 0 | 0.00 | 152.40 | 100 |
| 5781 | 20 | 35 | 5 | 40 | 0 | 0.10 | 9.50 | 0 |
| 7788 | 50 | 45 | 0 | 5 | 0 | 16.50 | 62.00 | 0 |
| 7788 | 35 | 35 | 15 | 15 | 0 | 1.00 | 12.50 | 0 |
| 7788 | 50 | 10 | 0 | 0 | 40 | 4.00 | 45.50 | 0 |
| 7788 | 45 | 30 | 10 | 15 | 0 | 2.00 | 23.50 | 0 |
| 7788 | 100 | 0 | 0 | 0 | 0 | 30.00 | 0.00 | 0 |
| 7788 | 15 | 0 | 5 | 80 | 0 | 2.50 | 18.00 | 0 |
| 7788 | 20 | 0 | 0 | 5 | 0 | 9.00 | 60.00 | 75 |
| 7788 | 5 | 25 | 5 | 50 | 5 | 0.10 | 30.00 | 0 |
| 7788 | 10 | 10 | 5 | 60 | 15 | 0.20 | 41.00 | 0 |
| 7788 | 0 | 5 | 20 | 75 | 0 | 0.00 | 44.00 | 0 |
| 7749 | 30 | 15 | 20 | 5 | 0 | 6.00 | 23.50 | 0 |
| 7749 | 35 | 45 | 0 | 20 | 0 | 2.50 | 35.00 | 0 |
| 7749 | 25 | 20 | 20 | 5 | 25 | 5.50 | 78.50 | 0 |
| 7749 | 30 | 45 | 15 | 10 | 0 | 3.50 | 73.00 | 0 |
| 7749 | 15 | 35 | 35 | 15 | 0 | 3.00 | 56.00 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7749 | 45 | 15 | 15 | 25 | 0 | 3.50 | 61.00 | 0 |
| 7772 | 20 | 65 | 5 | 10 | 0 | 2.00 | 50.00 | 0 |
| 7772 | 20 | 30 | 20 | 20 | 10 | 1.50 | 45.50 | 0 |
| 7767 | 35 | 30 | 5 | 10 | 20 | 5.00 | 38.00 | 0 |
| 7767 | 30 | 25 | 20 | 25 | 0 | 0.50 | 35.00 | 0 |
| 6431 | 25 | 35 | 5 | 10 | 25 | 18.00 | 25.00 | 0 |
| 6431 | 25 | 20 | 5 | 50 | 0 | 1.50 | 20.50 | 0 |
| 6431 | 80 | 15 | 5 | 0 | 0 | 4.00 | 34.00 | 0 |
| 6431 | 20 | 15 | 0 | 65 | 0 | 6.50 | 16.00 | 0 |
| 6431 | 20 | 35 | 0 | 20 | 25 | 0.50 | 31.00 | 0 |
| 6431 | 10 | 25 | 0 | 65 | 0 | 0.50 | 24.00 | 0 |
| 6431 | 15 | 0 | 0 | 5 | 80 | 16.00 | 67.00 | 0 |
| 6431 | 25 | 30 | 10 | 35 | 0 | 2.50 | 40.00 | 0 |
| 6541 | 20 | 50 | 5 | 10 | 15 | 1.00 | 59.00 | 0 |
| 6541 | 20 | 55 | 10 | 0 | 15 | 23.00 | 40.00 | 0 |
| 6433 | 15 | 70 | 10 | 5 | 0 | 5.00 | 62.50 | 0 |
| 6433 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |
| 6434 | 20 | 0 | 35 | 15 | 0 | 6.00 | 72.00 | 0 |
| 6434 | 10 | 70 | 15 | 5 | 0 | 0.50 | 118.00 | 0 |
| 7754 | 80 | 20 | 0 | 0 | 0 | 2.00 | 22.50 | 0 |
| 7754 | 25 | 70 | 5 | 0 | 0 | 1.00 | 34.00 | 0 |
| 7754 | 55 | 40 | 5 | 0 | 0 | 0.70 | 25.00 | 0 |
| 7754 | 25 | 35 | 15 | 5 | 20 | 3.00 | 44.00 | 0 |
| 7754 | 30 | 10 | 0 | 20 | 0 | 21.00 | 62.00 | 40 |
| 7754 | 15 | 75 | 5 | 5 | 0 | 3.00 | 41.00 | 0 |
| 7754 | 10 | 80 | 5 | 0 | 5 | 2.00 | 47.00 | 0 |
| 7754 | 15 | 45 | 0 | 40 | 0 | 0.20 | 37.50 | 0 |

| Bird-ID | Litter % 1m E | Grass % 1m E | Forbs % 1m E | Bare % 1m E | Shrubs % 1m E | Litter Depth (cm) 1m E | Tallest Plant (cm) 1m E | Exotic 1m E |
|---|---|---|---|---|---|---|---|---|
| 7758 | 55 | 10 | 5 | 30 | 0 | 2.00 | 20.50 | 0 |
| 7758 | 0 | 15 | 10 | 75 | 0 | 0.00 | 22.00 | 0 |
| 6514 | 20 | 0 | 0 | 0 | 80 | 7.00 | 243.80 | 0 |
| 6514 | 20 | 30 | 5 | 45 | 0 | 3.50 | 25.00 | 0 |
| 6514 | 65 | 20 | 10 | 5 | 0 | 9.00 | 28.00 | 0 |
| 6514 | 20 | 20 | 15 | 20 | 25 | 2.50 | 42.00 | 0 |
| 5781 | 35 | 60 | 0 | 5 | 0 | 9.00 | 44.50 | 0 |
| 5781 | 55 | 15 | 15 | 5 | 10 | 2.50 | 26.00 | 0 |
| 5781 | 50 | 0 | 5 | 0 | 0 | 1.00 | 110.00 | 45 |
| 5781 | 45 | 15 | 15 | 0 | 0 | 1.50 | 64.00 | 25 |
| 7788 | 30 | 45 | 0 | 0 | 25 | 12.00 | 37.00 | 0 |
| 7788 | 15 | 60 | 5 | 15 | 15 | 0.20 | 38.70 | 0 |
| 7788 | 45 | 5 | 0 | 0 | 50 | 3.00 | 35.00 | 0 |
| 7788 | 45 | 20 | 15 | 10 | 10 | 1.00 | 33.50 | 0 |
| 7788 | 95 | 0 | 5 | 0 | 0 | 10.00 | 30.00 | 0 |
| 7788 | 15 | 0 | 5 | 45 | 0 | 6.00 | 29.00 | 0 |
| 7788 | 60 | 10 | 0 | 10 | 0 | 1.00 | 77.00 | 20 |
| 7788 | 10 | 40 | 5 | 45 | 0 | 2.50 | 14.00 | 0 |
| 7788 | 20 | 15 | 5 | 15 | 45 | 5.00 | 35.00 | 0 |
| 7788 | 5 | 15 | 5 | 75 | 0 | 0.20 | 65.00 | 0 |
| 7749 | 15 | 30 | 25 | 15 | 15 | 7.00 | 100.50 | 0 |
| 7749 | 10 | 70 | 20 | 0 | 0 | 7.00 | 54.00 | 0 |
| 7749 | 30 | 25 | 20 | 10 | 15 | 3.00 | 90.00 | 0 |
| 7749 | 45 | 30 | 10 | 15 | 0 | 6.00 | 53.50 | 0 |
| 7749 | 35 | 20 | 40 | 5 | 0 | 5.00 | 67.00 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 45 | 20 | 20 | 15 | 0 | 3.00 | 82.00 | 0 |
| 7772 | 15 | 40 | 10 | 25 | 10 | 1.00 | 49.50 | 0 |
| 7772 | 25 | 40 | 15 | 20 | 0 | 4.00 | 61.50 | 0 |
| 7767 | 25 | 5 | 25 | 0 | 45 | 4.50 | 80.00 | 0 |
| 7767 | 15 | 55 | 20 | 0 | 10 | 5.00 | 68.00 | 0 |
| 6431 | 0 | 0 | 0 | 0 | 100 | 0.00 | 182.80 | 0 |
| 6431 | 25 | 15 | 5 | 55 | 0 | 3.00 | 32.00 | 10 |
| 6431 | 10 | 0 | 0 | 10 | 5 | 0.20 | 438.00 | 75 |
| 6431 | 10 | 30 | 0 | 60 | 0 | 3.00 | 13.50 | 0 |
| 6431 | 25 | 30 | 0 | 15 | 30 | 5.00 | 30.50 | 0 |
| 6431 | 60 | 30 | 5 | 0 | 0 | 3.50 | 42.00 | 5 |
| 6431 | 45 | 0 | 0 | 5 | 50 | 23.00 | 41.00 | 0 |
| 6431 | 30 | 15 | 5 | 50 | 0 | 3.00 | 32.00 | 0 |
| 6541 | 15 | 50 | 0 | 35 | 0 | 1.50 | 55.00 | 0 |
| 6541 | 25 | 5 | 10 | 15 | 45 | 27.00 | 90.00 | 0 |
| 6433 | 25 | 15 | 5 | 55 | 0 | 5.00 | 36.00 | 0 |
| 6433 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |
| 6434 | 40 | 10 | 20 | 10 | 20 | 14.00 | 53.00 | 0 |
| 6434 | 5 | 80 | 5 | 10 | 0 | 0.50 | 57.00 | 0 |
| 7754 | 75 | 20 | 0 | 5 | 0 | 2.50 | 33.00 | 0 |
| 7754 | 40 | 35 | 0 | 5 | 0 | 5.00 | 26.00 | 0 |
| 7754 | 40 | 45 | 5 | 0 | 0 | 5.00 | 30.00 | 10 |
| 7754 | 15 | 40 | 0 | 5 | 40 | 1.50 | 52.00 | 0 |
| 7754 | 20 | 35 | 0 | 0 | 0 | 4.00 | 65.00 | 45 |
| 7754 | 10 | 85 | 5 | 0 | 0 | 1.00 | 37.50 | 0 |
| 7754 | 40 | 60 | 0 | 0 | 0 | 5.00 | 45.00 | 0 |
| 7754 | 10 | 85 | 0 | 5 | 0 | 0.20 | 39.00 | 0 |

| Bird-ID | Litter % 1m S | Grass % 1m S | Forbs % 1m S | Bare % 1m S | Shrubs % 1mS | Litter Depth (cm) 1m S | Tallest Plant (cm) 1m S | Exotic 1m S |
|---|---|---|---|---|---|---|---|---|
| 7758 | 80 | 10 | 0 | 5 | 5 | 7.50 | 12.00 | 0 |
| 7758 | 5 | 20 | 15 | 60 | 0 | 0.50 | 19.00 | 0 |
| 6514 | 20 | 40 | 10 | 20 | 10 | 3.00 | 78.00 | 0 |
| 6514 | 10 | 45 | 5 | 40 | 0 | 1.50 | 63.00 | 0 |
| 6514 | 40 | 50 | 5 | 5 | 0 | 7.00 | 61.00 | 0 |
| 6514 | 30 | 40 | 20 | 0 | 10 | 7.50 | 71.00 | 0 |
| 5781 | 50 | 0 | 0 | 5 | 45 | 12.00 | 71.00 | 0 |
| 5781 | 40 | 15 | 15 | 0 | 30 | 7.00 | 60.00 | 0 |
| 5781 | 30 | 0 | 0 | 0 | 35 | 1.00 | 60.00 | 35 |
| 5781 | 35 | 25 | 10 | 30 | 0 | 1.00 | 10.50 | 0 |
| 7788 | 20 | 20 | 5 | 55 | 0 | 8.50 | 35.00 | 0 |
| 7788 | 15 | 10 | 10 | 65 | 0 | 0.20 | 25.00 | 0 |
| 7788 | 60 | 10 | 0 | 0 | 30 | 15.00 | 67.00 | 0 |
| 7788 | 10 | 30 | 5 | 55 | 0 | 0.20 | 15.00 | 0 |
| 7788 | 95 | 0 | 5 | 0 | 0 | 12.00 | 20.50 | 0 |
| 7788 | 30 | 0 | 15 | 65 | 0 | 6.00 | 29.50 | 0 |
| 7788 | 0 | 0 | 0 | 0 | 0 | 0.00 | 128.00 | 100 |
| 7788 | 10 | 70 | 0 | 20 | 0 | 0.10 | 6.50 | 0 |
| 7788 | 20 | 5 | 10 | 60 | 5 | 0.10 | 30.30 | 0 |
| 7788 | 0 | 5 | 5 | 90 | 0 | 0.00 | 18.50 | 0 |
| 7749 | 20 | 5 | 75 | 0 | 0 | 5.00 | 73.00 | 0 |
| 7749 | 45 | 45 | 5 | 5 | 0 | 1.50 | 58.00 | 0 |
| 7749 | 20 | 65 | 10 | 0 | 5 | 3.00 | 62.00 | 0 |
| 7749 | 5 | 55 | 20 | 10 | 0 | 4.00 | 101.50 | 10 |
| 7749 | 25 | 40 | 35 | 0 | 0 | 2.00 | 31.00 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 25 | 20 | 25 | 25 | 5 | 1.50 | 60.00 | 0 |
| 7772 | 60 | 30 | 0 | 10 | 0 | 28.00 | 52.00 | 0 |
| 7772 | 10 | 60 | 20 | 10 | 0 | 3.00 | 33.00 | 0 |
| 7767 | 10 | 20 | 5 | 0 | 65 | 6.50 | 102.50 | 0 |
| 7767 | 30 | 55 | 5 | 10 | 0 | 3.50 | 49.00 | 0 |
| 6431 | 30 | 0 | 15 | 15 | 40 | 5.00 | 55.00 | 0 |
| 6431 | 30 | 25 | 5 | 40 | 0 | 3.00 | 17.50 | 0 |
| 6431 | 0 | 0 | 0 | 0 | 100 | 0.00 | 106.70 | 0 |
| 6431 | 25 | 10 | 0 | 65 | 0 | 4.00 | 15.50 | 0 |
| 6431 | 0 | 0 | 0 | 0 | 100 | 0.00 | 45.00 | 0 |
| 6431 | 15 | 15 | 0 | 0 | 0 | 2.50 | 124.00 | 60 |
| 6431 | 20 | 30 | 5 | 25 | 20 | 3.00 | 53.00 | 0 |
| 6431 | 75 | 20 | 5 | 0 | 0 | 5.00 | 59.00 | 0 |
| 6541 | 25 | 50 | 10 | 15 | 0 | 2.50 | 46.00 | 0 |
| 6541 | 55 | 0 | 0 | 0 | 45 | 30.00 | 57.00 | 0 |
| 6433 | 80 | 5 | 5 | 5 | 0 | 8.00 | 10.00 | 5 |
| 6433 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |
| 6434 | 40 | 0 | 60 | 0 | 0 | 9.00 | 139.00 | 0 |
| 6434 | 20 | 60 | 5 | 15 | 0 | 3.50 | 48.00 | 0 |
| 7754 | 60 | 35 | 5 | 0 | 0 | 4.00 | 41.00 | 0 |
| 7754 | 55 | 25 | 20 | 0 | 0 | 2.00 | 32.00 | 0 |
| 7754 | 40 | 40 | 20 | 0 | 0 | 3.00 | 23.00 | 0 |
| 7754 | 15 | 25 | 30 | 25 | 5 | 0.50 | 35.00 | 0 |
| 7754 | 25 | 30 | 20 | 5 | 0 | 5.00 | 64.00 | 20 |
| 7754 | 25 | 55 | 20 | 0 | 0 | 5.00 | 85.00 | 0 |
| 7754 | 25 | 65 | 10 | 0 | 0 | 3.50 | 42.00 | 0 |
| 7754 | 10 | 80 | 0 | 10 | 0 | 0.20 | 34.00 | 0 |

| Bird-ID | Litter % 1m W | Grass % 1m W | Forbs % 1m W | Bare % 1m W | Shrubs % 1m W | Litter Depth (cm) 1m W | Tallest Plant (cm) 1m W | Exotic 1m W |
|---|---|---|---|---|---|---|---|---|
| 7758 | 80 | 0 | 0 | 0 | 0 | 55.00 | 243.80 | 20 |
| 7758 | 40 | 30 | 20 | 10 | 0 | 7.00 | 26.50 | 0 |
| 6514 | 55 | 5 | 10 | 10 | 20 | 47.00 | 35.50 | 0 |
| 6514 | 10 | 30 | 5 | 40 | 15 | 0.20 | 47.00 | 0 |
| 6514 | 25 | 20 | 5 | 25 | 25 | 4.00 | 79.00 | 0 |
| 6514 | 40 | 20 | 25 | 15 | 0 | 2.00 | 30.00 | 0 |
| 5781 | 25 | 35 | 0 | 30 | 10 | 10.00 | 37.00 | 0 |
| 5781 | 40 | 25 | 35 | 0 | 0 | 4.00 | 66.00 | 0 |
| 5781 | 20 | 0 | 0 | 0 | 35 | 8.00 | 102.00 | 45 |
| 5781 | 20 | 30 | 10 | 40 | 0 | 2.50 | 22.50 | 0 |
| 7788 | 65 | 10 | 15 | 10 | 0 | 10.50 | 22.00 | 0 |
| 7788 | 30 | 15 | 10 | 35 | 10 | 2.00 | 17.00 | 0 |
| 7788 | 35 | 20 | 0 | 0 | 45 | 3.00 | 59.00 | 0 |
| 7788 | 25 | 30 | 0 | 45 | 0 | 0.50 | 16.00 | 0 |
| 7788 | 100 | 0 | 0 | 0 | 0 | 8.00 | 0.00 | 0 |
| 7788 | 30 | 0 | 0 | 70 | 0 | 4.00 | 0.00 | 0 |
| 7788 | 20 | 0 | 0 | 20 | 0 | 5.00 | 13.00 | 60 |
| 7788 | 5 | 15 | 5 | 75 | 0 | 1.00 | 26.00 | 0 |
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 10 | 10 | 5 | 70 | 5 | 2.50 | 25.00 | 0 |
| 7749 | 50 | 10 | 35 | 5 | 0 | 4.50 | 78.00 | 0 |
| 7749 | 25 | 35 | 15 | 25 | 0 | 3.00 | 25.00 | 0 |
| 7749 | 30 | 25 | 20 | 0 | 25 | 3.00 | 37.50 | 0 |
| 7749 | 30 | 30 | 10 | 30 | 0 | 2.50 | 20.50 | 0 |
| 7749 | 10 | 15 | 25 | 0 | 25 | 1.00 | 39.50 | 25 |

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|---|---|---|---|---|---|---|---|---|---|
| 7749 | 10 | 10 | 45 | 35 | 0 | | 2.00 | 30.00 | 0 |
| 7772 | 15 | 35 | 0 | 50 | 0 | | 0.50 | 28.00 | 0 |
| 7772 | 15 | 50 | 20 | 5 | 10 | | 1.00 | 52.50 | 0 |
| 7767 | 20 | 60 | 5 | 0 | 15 | | 1.00 | 50.00 | 0 |
| 7767 | 30 | 15 | 5 | 50 | 0 | | 3.00 | 22.50 | 0 |
| 6431 | 30 | 0 | 25 | 30 | 0 | | 8.00 | 27.00 | 15 |
| 6431 | 20 | 30 | 0 | 50 | 0 | | 0.20 | 47.50 | 0 |
| 6431 | 60 | 15 | 0 | 15 | 10 | | 6.00 | 61.50 | 0 |
| 6431 | 30 | 15 | 0 | 55 | 0 | | 2.50 | 16.50 | 0 |
| 6431 | 30 | 40 | 15 | 10 | 5 | | 0.50 | 43.00 | 0 |
| 6431 | 20 | 15 | 0 | 65 | 0 | | 0.80 | 24.00 | 0 |
| 6431 | 10 | 20 | 0 | 20 | 50 | | 2.00 | 97.00 | 0 |
| 6431 | 40 | 30 | 15 | 15 | 0 | | 6.50 | 70.00 | 0 |
| 6541 | 15 | 50 | 5 | 30 | 0 | | 2.50 | 37.00 | 0 |
| 6541 | 15 | 5 | 20 | 20 | 40 | | 1.00 | 47.00 | 0 |
| 6433 | 25 | 5 | 10 | 15 | 45 | | 5.00 | 47.50 | 0 |
| 6433 | 0 | 0 | 0 | 100 | 0 | | 0.00 | 0.00 | 0 |
| 6434 | 20 | 70 | 10 | 0 | 0 | | 4.00 | 80.00 | 0 |
| 6434 | 20 | 65 | 5 | 10 | 0 | | 1.00 | 80.00 | 0 |
| 7754 | 50 | 10 | 0 | 0 | 0 | | 5.00 | 165.10 | 40 |
| 7754 | 60 | 30 | 10 | 0 | 0 | | 1.50 | 17.00 | 0 |
| 7754 | 35 | 10 | 0 | 15 | 0 | | 49.00 | 23.00 | 40 |
| 7754 | 20 | 35 | 15 | 25 | 5 | | 0.50 | 58.00 | 0 |
| 7754 | 20 | 10 | 5 | 10 | 35 | | 2.00 | 42.00 | 20 |
| 7754 | 20 | 75 | 5 | 0 | 0 | | 2.00 | 58.00 | 0 |
| 7754 | 10 | 45 | 0 | 0 | 45 | | 2.00 | 45.00 | 0 |
| 7754 | 15 | 75 | 0 | 10 | 0 | | 0.20 | 32.00 | 0 |

| Bird-ID | Litter % 5m N | Grass % 5m N | Forbs % 5m N | Bare % 5m N | Shrubs % 5m N | Litter Depth (cm) 5m N | Tallest Plant (cm) 5m N | Exotic 5m N |
|---|---|---|---|---|---|---|---|---|
| 7758 | 25 | 25 | 0 | 50 | 0 | 0.10 | 8.50 | 0 |
| 7758 | 5 | 75 | 15 | 5 | 0 | 1.50 | 43.00 | 0 |
| 6514 | 30 | 45 | 25 | 0 | 0 | 5.00 | 44.00 | 0 |
| 6514 | 40 | 30 | 10 | 20 | 0 | 2.50 | 33.00 | 0 |
| 6514 | 30 | 30 | 5 | 35 | 0 | 0.40 | 16.00 | 0 |
| 6514 | 35 | 35 | 20 | 10 | 0 | 20.00 | 85.00 | 0 |
| 5781 | 10 | 35 | 0 | 55 | 0 | 0.50 | 8.00 | 0 |
| 5781 | 60 | 20 | 15 | 0 | 5 | 7.00 | 63.00 | 0 |
| 5781 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |
| 5781 | 10 | 35 | 5 | 50 | 0 | 0.10 | 7.50 | 0 |
| 7788 | 10 | 30 | 25 | 35 | 0 | 0.50 | 21.00 | 0 |
| 7788 | 15 | 30 | 10 | 45 | 0 | 3.00 | 53.50 | 0 |
| 7788 | 30 | 60 | 5 | 5 | 0 | 7.50 | 25.00 | 0 |
| 7788 | 45 | 15 | 10 | 5 | 15 | 2.00 | 36.00 | 0 |
| 7788 | 0 | 0 | 5 | 95 | 0 | 0.00 | 19.00 | 0 |
| 7788 | 30 | 0 | 5 | 65 | 0 | 5.00 | 25.00 | 0 |
| 7788 | 0 | 65 | 30 | 5 | 0 | 0.00 | 70.00 | 0 |
| 7788 | 0 | 30 | 5 | 55 | 10 | 0.00 | 26.00 | 0 |
| 7788 | 5 | 5 | 0 | 90 | 0 | 0.10 | 9.00 | 0 |
| 7788 | 5 | 10 | 10 | 75 | 0 | 1.50 | 36.00 | 0 |
| 7749 | 60 | 20 | 5 | 15 | 0 | 5.50 | 41.50 | 0 |
| 7749 | 10 | 80 | 0 | 10 | 0 | 1.00 | 35.00 | 0 |
| 7749 | 25 | 25 | 5 | 15 | 30 | 2.00 | 77.50 | 0 |
| 7749 | 10 | 10 | 15 | 65 | 0 | 0.50 | 31.50 | 0 |
| 7749 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 45 | 10 | 35 | 10 | 0 | 16.50 | 38.00 | 0 |
| 7772 | 15 | 65 | 0 | 20 | 0 | 1.50 | 51.50 | 0 |
| 7772 | 30 | 15 | 25 | 0 | 30 | 7.00 | 62.50 | 0 |
| 7767 | 15 | 25 | 0 | 60 | 0 | 2.00 | 20.00 | 0 |
| 7767 | 35 | 40 | 5 | 20 | 0 | 1.50 | 29.00 | 0 |
| 6431 | 15 | 25 | 25 | 35 | 0 | 6.00 | 35.00 | 0 |
| 6431 | 10 | 65 | 5 | 20 | 0 | 1.50 | 14.00 | 0 |
| 6431 | 20 | 45 | 0 | 35 | 0 | 3.00 | 28.50 | 0 |
| 6431 | 15 | 25 | 5 | 55 | 0 | 2.50 | 16.00 | 0 |
| 6431 | 30 | 15 | 10 | 45 | 0 | 3.00 | 24.00 | 0 |
| 6431 | 5 | 20 | 10 | 50 | 15 | 2.00 | 32.50 | 0 |
| 6431 | 5 | 85 | 0 | 10 | 0 | 1.00 | 44.00 | 0 |
| 6431 | 40 | 20 | 10 | 0 | 0 | 6.00 | 130.00 | 30 |
| 6541 | 5 | 85 | 0 | 10 | 0 | 0.50 | 48.00 | 0 |
| 6541 | 20 | 30 | 15 | 30 | 5 | 2.00 | 56.00 | 0 |
| 6433 | 15 | 40 | 10 | 20 | 15 | 3.00 | 79.00 | 0 |
| 6433 | 5 | 15 | 40 | 20 | 20 | 1.00 | 62.50 | 0 |
| 6434 | 15 | 60 | 25 | 0 | 0 | 5.00 | 70.50 | 0 |
| 6434 | 15 | 75 | 5 | 15 | 0 | 4.50 | 49.00 | 0 |
| 7754 | 20 | 70 | 10 | 0 | 0 | 1.00 | 39.00 | 0 |
| 7754 | 60 | 30 | 0 | 10 | 0 | 1.00 | 28.00 | 0 |
| 7754 | 30 | 50 | 15 | 5 | 0 | 3.00 | 30.00 | 0 |
| 7754 | 5 | 40 | 5 | 30 | 20 | 1.00 | 55.00 | 0 |
| 7754 | 25 | 55 | 5 | 15 | 0 | 0.50 | 30.00 | 0 |
| 7754 | 20 | 35 | 0 | 45 | 0 | 0.20 | 14.50 | 0 |
| 7754 | 5 | 65 | 10 | 20 | 0 | 0.20 | 27.00 | 0 |
| 7754 | 10 | 55 | 15 | 20 | 0 | 0.20 | 30.00 | 0 |

| Bird-ID | Litter % 5m E | Grass % 5m E | Forbs % 5m E | Bare % 5m E | Shrubs % 5m E | Litter Depth (cm) 5m E | Tallest Plant (cm) 5m E | Exotic 5m E |
|---|---|---|---|---|---|---|---|---|
| 7758 | 20 | 70 | 0 | 10 | 0 | 1.50 | 26.00 | 0 |
| 7758 | 0 | 60 | 15 | 0 | 25 | 0.00 | 60.00 | 0 |
| 6514 | 10 | 35 | 0 | 55 | 0 | 0.20 | 9.50 | 0 |
| 6514 | 40 | 35 | 10 | 10 | 5 | 1.00 | 112.00 | 0 |
| 6514 | 20 | 25 | 5 | 50 | 0 | 0.10 | 8.00 | 0 |
| 6514 | 75 | 0 | 10 | 0 | 15 | 29.00 | 61.50 | 0 |
| 5781 | 25 | 60 | 5 | 5 | 5 | 3.00 | 57.50 | 0 |
| 5781 | 50 | 20 | 30 | 0 | 0 | 4.50 | 35.00 | 0 |
| 5781 | 20 | 25 | 5 | 50 | 0 | 0.10 | 5.00 | 0 |
| 5781 | 30 | 35 | 15 | 25 | 0 | 1.00 | 25.00 | 0 |
| 7788 | 10 | 35 | 5 | 50 | 0 | 0.20 | 10.10 | 0 |
| 7788 | 10 | 20 | 15 | 55 | 0 | 2.50 | 28.00 | 0 |
| 7788 | 10 | 35 | 0 | 55 | 0 | 0.20 | 16.00 | 0 |
| 7788 | 35 | 20 | 10 | 30 | 5 | 1.50 | 23.00 | 0 |
| 7788 | 95 | 0 | 5 | 0 | 0 | 6.00 | 7.00 | 0 |
| 7788 | 15 | 0 | 0 | 85 | 0 | 6.50 | 0.00 | 0 |
| 7788 | 20 | 30 | 50 | 0 | 0 | 14.00 | 61.00 | 0 |
| 7788 | 30 | 35 | 0 | 25 | 15 | 1.50 | 47.00 | 0 |
| 7788 | 5 | 25 | 5 | 60 | 5 | 0.10 | 36.00 | 0 |
| 7788 | 5 | 10 | 25 | 60 | 0 | 2.00 | 66.00 | 0 |
| 7749 | 0 | 5 | 15 | 0 | 80 | 0.00 | 96.50 | 0 |
| 7749 | 15 | 45 | 10 | 30 | 0 | 3.00 | 82.00 | 0 |
| 7749 | 15 | 55 | 10 | 5 | 15 | 2.50 | 79.00 | 0 |
| 7749 | 25 | 40 | 5 | 30 | 0 | 2.50 | 32.50 | 0 |
| 7749 | 5 | 85 | 5 | 5 | 0 | 2.00 | 64.00 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 20 | 25 | 35 | 0 | 20 | 2.00 | 125.00 | 0 |
| 7772 | 10 | 60 | 0 | 5 | 25 | 3.00 | 59.00 | 0 |
| 7772 | 30 | 25 | 30 | 15 | 0 | 3.50 | 81.00 | 0 |
| 7767 | 30 | 60 | 5 | 5 | 0 | 2.50 | 55.00 | 0 |
| 7767 | 10 | 0 | 0 | 0 | 90 | 4.00 | 77.00 | 0 |
| 6431 | 0 | 10 | 5 | 85 | 0 | 0.00 | 16.00 | 0 |
| 6431 | 5 | 15 | 0 | 80 | 0 | 0.20 | 6.00 | 0 |
| 6431 | 30 | 30 | 0 | 15 | 25 | 4.00 | 44.00 | 0 |
| 6431 | 20 | 15 | 0 | 55 | 0 | 4.00 | 11.00 | 0 |
| 6431 | 35 | 60 | 5 | 0 | 0 | 5.00 | 31.50 | 0 |
| 6431 | 40 | 25 | 0 | 35 | 0 | 3.50 | 18.50 | 0 |
| 6431 | 25 | 60 | 10 | 5 | 0 | 1.00 | 69.00 | 0 |
| 6431 | 25 | 60 | 5 | 10 | 0 | 6.50 | 99.00 | 0 |
| 6541 | 15 | 55 | 5 | 10 | 15 | 2.00 | 45.00 | 0 |
| 6541 | 5 | 60 | 5 | 30 | 0 | 1.00 | 25.00 | 0 |
| 6433 | 35 | 25 | 5 | 15 | 20 | 3.50 | 98.50 | 0 |
| 6433 | 0 | 0 | 15 | 85 | 0 | 0.00 | 21.00 | 0 |
| 6434 | 25 | 45 | 30 | 0 | 0 | 15.00 | 76.00 | 0 |
| 6434 | 20 | 65 | 5 | 10 | 0 | 1.50 | 50.00 | 0 |
| 7754 | 60 | 40 | 0 | 0 | 0 | 4.00 | 39.50 | 0 |
| 7754 | 35 | 65 | 0 | 0 | 0 | 2.50 | 47.00 | 0 |
| 7754 | 25 | 70 | 0 | 5 | 0 | 6.00 | 47.00 | 10 |
| 7754 | 5 | 50 | 25 | 15 | 5 | 0.50 | 31.00 | 0 |
| 7754 | 25 | 45 | 0 | 30 | 0 | 0.20 | 31.00 | 0 |
| 7754 | 25 | 65 | 10 | 0 | 0 | 10.00 | 28.00 | 0 |
| 7754 | 20 | 65 | 15 | 0 | 0 | 1.50 | 45.00 | 0 |
| 7754 | 10 | 70 | 10 | 10 | 0 | 0.30 | 32.50 | 0 |

| Bird-ID | Litter % 5m S | Grass % 5m S | Forbs % 5m S | Bare % 5m S | Shrubs % 5m S | Litter Depth (cm) 5m S | Tallest Plant (cm) 5m S | Exotic 5m S |
|---|---|---|---|---|---|---|---|---|
| 7758 | 50 | 25 | 0 | 25 | 0 | 0.30 | 7.00 | 0 |
| 7758 | 10 | 55 | 20 | 15 | 0 | 2.00 | 46.00 | 0 |
| 6514 | 5 | 25 | 25 | 45 | 0 | 0.90 | 29.00 | 0 |
| 6514 | 20 | 55 | 10 | 15 | 0 | 2.00 | 59.00 | 0 |
| 6514 | 20 | 45 | 10 | 0 | 25 | 2.00 | 60.00 | 0 |
| 6514 | 10 | 15 | 15 | 15 | 45 | 2.50 | 80.00 | 0 |
| 5781 | 5 | 40 | 5 | 50 | 0 | 0.20 | 7.00 | 0 |
| 5781 | 65 | 5 | 20 | 10 | 0 | 1.50 | 28.00 | 0 |
| 5781 | 25 | 65 | 0 | 10 | 0 | 1.50 | 7.00 | 0 |
| 5781 | 10 | 30 | 15 | 45 | 0 | 0.10 | 6.00 | 0 |
| 7788 | 20 | 10 | 20 | 40 | 10 | 1.00 | 22.50 | 0 |
| 7788 | 15 | 40 | 15 | 30 | 0 | 1.50 | 23.50 | 0 |
| 7788 | 10 | 40 | 5 | 40 | 5 | 2.50 | 15.50 | 0 |
| 7788 | 40 | 30 | 5 | 25 | 0 | 1.00 | 19.00 | 0 |
| 7788 | 10 | 0 | 5 | 85 | 0 | 0.50 | 12.00 | 0 |
| 7788 | 50 | 0 | 10 | 40 | 0 | 2.00 | 31.00 | 0 |
| 7788 | 40 | 35 | 5 | 20 | 0 | 6.00 | 31.00 | 0 |
| 7788 | 5 | 15 | 15 | 65 | 0 | 0.10 | 27.00 | 0 |
| 7788 | 5 | 15 | 35 | 45 | 0 | 2.50 | 23.00 | 0 |
| 7788 | 10 | 10 | 20 | 60 | 0 | 2.00 | 83.20 | 0 |
| 7749 | 50 | 20 | 25 | 5 | 0 | 8.50 | 34.00 | 0 |
| 7749 | 40 | 55 | 5 | 0 | 0 | 3.00 | 52.00 | 0 |
| 7749 | 30 | 30 | 5 | 15 | 20 | 4.00 | 75.00 | 0 |
| 7749 | 15 | 20 | 15 | 20 | 0 | 5.00 | 95.00 | 30 |
| 7749 | 10 | 60 | 10 | 15 | 5 | 0.00 | 30.00 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 10 | 5 | 35 | 25 | 25 | 1.00 | 99.00 | 0 |
| 7772 | 15 | 60 | 5 | 20 | 0 | 4.50 | 30.00 | 0 |
| 7772 | 10 | 45 | 25 | 15 | 5 | 2.50 | 39.50 | 0 |
| 7767 | 35 | 30 | 25 | 10 | 0 | 30.50 | 42.00 | 0 |
| 7767 | 50 | 45 | 5 | 0 | 0 | 4.00 | 35.00 | 0 |
| 6431 | 10 | 35 | 20 | 35 | 0 | 1.00 | 36.50 | 0 |
| 6431 | 45 | 50 | 0 | 5 | 0 | 14.00 | 40.00 | 0 |
| 6431 | 55 | 40 | 0 | 5 | 0 | 3.00 | 18.00 | 0 |
| 6431 | 15 | 25 | 0 | 60 | 0 | 2.50 | 14.50 | 0 |
| 6431 | 35 | 35 | 5 | 20 | 5 | 2.00 | 43.00 | 0 |
| 6431 | 10 | 15 | 5 | 60 | 0 | 0.50 | 34.50 | 10 |
| 6431 | 30 | 45 | 25 | 0 | 0 | 3.50 | 63.50 | 0 |
| 6431 | 45 | 50 | 5 | 0 | 0 | 4.00 | 65.50 | 0 |
| 6541 | 25 | 35 | 25 | 15 | 0 | 1.00 | 49.00 | 0 |
| 6541 | 10 | 10 | 5 | 0 | 75 | 2.00 | 50.00 | 0 |
| 6433 | 25 | 35 | 5 | 35 | 0 | 2.00 | 35.00 | 0 |
| 6433 | 0 | 0 | 15 | 75 | 0 | 0.00 | 21.00 | 0 |
| 6434 | 20 | 45 | 35 | 0 | 0 | 0.20 | 87.00 | 0 |
| 6434 | 10 | 85 | 0 | 5 | 0 | 18.00 | 42.00 | 0 |
| 7754 | 15 | 75 | 0 | 10 | 0 | 1.00 | 24.00 | 0 |
| 7754 | 30 | 70 | 0 | 0 | 0 | 3.00 | 50.00 | 0 |
| 7754 | 50 | 40 | 10 | 0 | 0 | 1.50 | 37.00 | 0 |
| 7754 | 35 | 30 | 15 | 20 | 0 | 1.00 | 48.00 | 0 |
| 7754 | 20 | 65 | 10 | 5 | 0 | 0.50 | 44.50 | 0 |
| 7754 | 5 | 30 | 15 | 0 | 50 | 9.00 | 111.00 | 0 |
| 7754 | 10 | 55 | 20 | 15 | 0 | 0.30 | 52.50 | 0 |
| 7754 | 15 | 75 | 10 | 0 | 0 | 5.00 | 34.00 | 0 |

| Bird-ID | Litter % 5m W | Grass % 5m W | Forbs % 5m W | Bare % 5m W | Shrubs % 5m W | Litter Depth (cm) 5m W | Tallest Plant (cm) 5m W | Exotic 5m W |
|---|---|---|---|---|---|---|---|---|
| 7758 | 65 | 20 | 10 | 5 | 0 | 1.00 | 13.00 | 0 |
| 7758 | 10 | 40 | 20 | 70 | 0 | 0.20 | 16.00 | 0 |
| 6514 | 5 | 10 | 5 | 15 | 65 | 4.00 | 75.00 | 0 |
| 6514 | 5 | 60 | 10 | 5 | 20 | 0.10 | 80.50 | 0 |
| 6514 | 15 | 65 | 0 | 20 | 0 | 1.00 | 15.00 | 0 |
| 6514 | 10 | 60 | 15 | 15 | 0 | 0.20 | 100.00 | 0 |
| 5781 | 20 | 25 | 0 | 55 | 0 | 0.10 | 25.00 | 5 |
| 5781 | 85 | 5 | 10 | 0 | 0 | 1.50 | 8.50 | 0 |
| 5781 | 20 | 20 | 25 | 10 | 25 | 0.50 | 27.00 | 0 |
| 5781 | 55 | 10 | 15 | 20 | 0 | 2.50 | 12.00 | 0 |
| 7788 | 10 | 50 | 15 | 25 | 0 | 6.00 | 29.00 | 0 |
| 7788 | 10 | 25 | 5 | 35 | 25 | 0.20 | 35.00 | 0 |
| 7788 | 5 | 45 | 5 | 45 | 0 | 0.50 | 11.50 | 0 |
| 7788 | 5 | 25 | 5 | 65 | 0 | 0.50 | 16.00 | 0 |
| 7788 | 95 | 0 | 5 | 0 | 0 | 45.00 | 34.00 | 0 |
| 7788 | 70 | 0 | 5 | 25 | 0 | 5.00 | 37.50 | 0 |
| 7788 | 35 | 5 | 0 | 20 | 0 | 17.00 | 28.00 | 40 |
| 7788 | 10 | 65 | 5 | 20 | 0 | 1.00 | 50.00 | 0 |
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 0 | 0 | 5 | 45 | 50 | 0.00 | 73.00 | 0 |
| 7749 | 35 | 15 | 15 | 15 | 20 | 9.00 | 69.00 | 0 |
| 7749 | 20 | 40 | 5 | 25 | 10 | 2.50 | 37.00 | 0 |
| 7749 | 40 | 35 | 0 | 25 | 0 | 4.00 | 21.50 | 0 |
| 7749 | 70 | 15 | 5 | 0 | 0 | 7.50 | 57.00 | 10 |
| 7749 | 5 | 40 | 10 | 45 | 0 | 0.20 | 23.50 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 35 | 5 | 20 | 10 | 30 | 3.50 | 49.50 | 0 |
| 7772 | 10 | 55 | 5 | 30 | 0 | 1.00 | 34.50 | 0 |
| 7772 | 10 | 5 | 40 | 10 | 35 | 2.00 | 52.00 | 0 |
| 7767 | 35 | 25 | 30 | 0 | 10 | 35.00 | 77.00 | 0 |
| 7767 | 30 | 30 | 0 | 40 | 0 | 2.50 | 31.00 | 0 |
| 6431 | 45 | 20 | 5 | 30 | 0 | 6.00 | 37.50 | 0 |
| 6431 | 0 | 50 | 15 | 0 | 5 | 0.00 | 100.00 | 30 |
| 6431 | 10 | 30 | 15 | 45 | 0 | 0.30 | 37.00 | 0 |
| 6431 | 25 | 5 | 5 | 65 | 0 | 3.50 | 8.50 | 0 |
| 6431 | 5 | 10 | 25 | 60 | 0 | 0.30 | 47.00 | 0 |
| 6431 | 5 | 35 | 0 | 60 | 0 | 0.80 | 24.00 | 0 |
| 6431 | 25 | 40 | 15 | 20 | 0 | 0.50 | 72.50 | 0 |
| 6431 | 15 | 35 | 0 | 50 | 0 | 4.00 | 34.00 | 0 |
| 6541 | 25 | 40 | 30 | 5 | 0 | 2.00 | 48.00 | 0 |
| 6541 | 15 | 55 | 15 | 5 | 10 | 2.50 | 42.00 | 0 |
| 6433 | 5 | 65 | 0 | 5 | 25 | 3.00 | 71.00 | 0 |
| 6433 | 25 | 20 | 15 | 10 | 30 | 3.50 | 74.00 | 0 |
| 6434 | 10 | 35 | 30 | 25 | 0 | 2.00 | 65.00 | 0 |
| 6434 | 10 | 40 | 0 | 50 | 0 | 3.00 | 45.00 | 0 |
| 7754 | 50 | 25 | 5 | 20 | 0 | 1.00 | 30.50 | 0 |
| 7754 | 65 | 15 | 0 | 0 | 0 | 30.00 | 121.90 | 20 |
| 7754 | 65 | 35 | 0 | 0 | 0 | 2.00 | 44.00 | 0 |
| 7754 | 10 | 40 | 15 | 30 | 5 | 4.00 | 48.00 | 0 |
| 7754 | 20 | 15 | 5 | 60 | 0 | 1.00 | 7.50 | 0 |
| 7754 | 20 | 60 | 20 | 0 | 0 | 5.00 | 56.00 | 0 |
| 7754 | 25 | 55 | 20 | 0 | 0 | 3.00 | 46.00 | 0 |
| 7754 | 20 | 70 | 0 | 10 | 0 | 0.50 | 19.00 | 0 |

| Bird-ID | Litter % 10m N | Grass % 10m N | Forbs % 10m N | Bare % 10m N | Shrubs % 10m N | Litter Depth (cm) 10m N | Tallest Plant (cm) 10m N | Exotic 10m N |
|---|---|---|---|---|---|---|---|---|
| 7758 | 10 | 35 | 0 | 50 | 5 | 0.10 | 30.00 | 0 |
| 7758 | 0 | 25 | 10 | 45 | 20 | 0.00 | 35.00 | 0 |
| 6514 | 5 | 40 | 0 | 55 | 0 | 0.80 | 6.00 | 0 |
| 6514 | 10 | 80 | 0 | 10 | 0 | 0.50 | 43.00 | 0 |
| 6514 | 0 | 35 | 0 | 65 | 0 | 0.00 | 7.00 | 0 |
| 6514 | 10 | 50 | 5 | 5 | 30 | 2.50 | 64.00 | 0 |
| 5781 | 30 | 20 | 10 | 40 | 0 | 4.00 | 53.00 | 0 |
| 5781 | 55 | 30 | 5 | 0 | 10 | 4.00 | 19.00 | 0 |
| 5781 | 5 | 0 | 10 | 15 | 70 | 5.00 | 131.20 | 0 |
| 5781 | 30 | 20 | 20 | 30 | 0 | 0.20 | 20.00 | 0 |
| 7788 | 10 | 55 | 0 | 35 | 0 | 0.20 | 12.00 | 0 |
| 7788 | 10 | 55 | 10 | 25 | 0 | 8.50 | 23.00 | 0 |
| 7788 | 60 | 35 | 0 | 5 | 0 | 4.00 | 28.50 | 0 |
| 7788 | 0 | 20 | 5 | 75 | 0 | 0.00 | 8.50 | 0 |
| 7788 | 35 | 0 | 35 | 30 | 0 | 1.00 | 48.00 | 0 |
| 7788 | 10 | 0 | 5 | 85 | 0 | 1.00 | 12.00 | 0 |
| 7788 | 10 | 85 | 5 | 0 | 0 | 0.10 | 35.00 | 0 |
| 7788 | 0 | 50 | 5 | 35 | 10 | 0.00 | 70.00 | 0 |
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 5 | 5 | 15 | 60 | 15 | 0.50 | 40.00 | 0 |
| 7749 | 40 | 20 | 10 | 15 | 15 | 4.50 | 73.00 | 0 |
| 7749 | 10 | 65 | 0 | 25 | 0 | 3.00 | 42.00 | 0 |
| 7749 | 50 | 25 | 5 | 20 | 0 | 6.50 | 48.00 | 0 |
| 7749 | 15 | 15 | 5 | 30 | 5 | 0.50 | 60.00 | 30 |
| 7749 | 5 | 35 | 5 | 55 | 0 | 0.30 | 29.00 | 0 |

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|---|---|---|---|---|---|---|---|---|---|
| 7749 | 20 | 15 | 35 | 35 | 0 | | 3.00 | 51.00 | 0 |
| 7772 | 5 | 60 | 5 | 20 | 10 | | 1.00 | 34.50 | 0 |
| 7772 | 25 | 10 | 25 | 15 | 25 | | 0.50 | 94.00 | 0 |
| 7767 | 30 | 55 | 5 | 10 | 0 | | 1.50 | 29.50 | 0 |
| 7767 | 5 | 20 | 5 | 65 | 5 | | 0.30 | 14.50 | 0 |
| 6431 | 20 | 75 | 0 | 5 | 0 | | 3.00 | 34.00 | 0 |
| 6431 | 10 | 65 | 0 | 25 | 0 | | 1.00 | 51.00 | 0 |
| 6431 | 10 | 80 | 0 | 10 | 0 | | 1.00 | 67.50 | 0 |
| 6431 | 55 | 40 | 0 | 5 | 0 | | 4.50 | 15.50 | 0 |
| 6431 | 10 | 20 | 15 | 55 | 0 | | 0.50 | 31.50 | 0 |
| 6431 | 5 | 30 | 0 | 65 | 0 | | 0.20 | 29.00 | 0 |
| 6431 | 10 | 60 | 5 | 25 | 0 | | 3.00 | 55.50 | 0 |
| 6431 | 50 | 25 | 10 | 0 | 0 | | 5.00 | 80.00 | 15 |
| 6541 | 5 | 85 | 0 | 10 | 0 | | 0.50 | 48.00 | 0 |
| 6541 | 55 | 30 | 5 | 5 | 5 | | 2.00 | 56.00 | 0 |
| 6433 | 15 | 35 | 0 | 50 | 0 | | 0.30 | 48.00 | 0 |
| 6433 | 10 | 15 | 35 | 25 | 15 | | 2.00 | 53.00 | 0 |
| 6434 | 20 | 45 | 15 | 15 | 5 | | 0.50 | 67.00 | 0 |
| 6434 | 40 | 45 | 0 | 10 | 5 | | 0.80 | 55.00 | 0 |
| 7754 | 10 | 80 | 0 | 10 | 0 | | 0.30 | 29.50 | 0 |
| 7754 | 25 | 45 | 0 | 30 | 0 | | 1.00 | 13.00 | 0 |
| 7754 | 40 | 55 | 5 | 0 | 0 | | 1.00 | 27.00 | 0 |
| 7754 | 20 | 40 | 15 | 25 | 0 | | 2.50 | 35.00 | 0 |
| 7754 | 20 | 65 | 10 | 5 | 0 | | 0.50 | 32.50 | 0 |
| 7754 | 5 | 40 | 15 | 40 | 0 | | 4.00 | 49.00 | 0 |
| 7754 | 10 | 75 | 5 | 10 | 0 | | 0.20 | 40.50 | 0 |
| 7754 | 15 | 60 | 5 | 20 | 0 | | 1.00 | 47.00 | 0 |

| Bird-ID | Litter % 10m E | Grass % 10m E | Forbs % 10m E | Bare % 10m E | Shrubs % 10m E | Litter Depth (cm) 10m E | Tallest Plant (cm) 10m E | Exotic 10m E |
|---|---|---|---|---|---|---|---|---|
| 7758 | 25 | 65 | 5 | 5 | 0 | 1.00 | 22.00 | 0 |
| 7758 | 30 | 45 | 15 | 10 | 0 | 1.00 | 28.00 | 0 |
| 6514 | 25 | 45 | 0 | 30 | 0 | 1.00 | 38.50 | 0 |
| 6514 | 15 | 45 | 15 | 5 | 20 | 3.50 | 51.00 | 0 |
| 6514 | 5 | 30 | 0 | 65 | 0 | 0.10 | 8.50 | 0 |
| 6514 | 15 | 30 | 5 | 0 | 50 | 6.00 | 30.10 | 0 |
| 5781 | 40 | 25 | 30 | 5 | 0 | 6.00 | 25.00 | 0 |
| 5781 | 35 | 30 | 5 | 30 | 0 | 0.10 | 33.00 | 0 |
| 5781 | 25 | 35 | 0 | 15 | 25 | 0.20 | 50.00 | 0 |
| 5781 | 30 | 45 | 10 | 15 | 0 | 0.10 | 12.00 | 0 |
| 7788 | 15 | 30 | 25 | 30 | 0 | 2.00 | 18.00 | 0 |
| 7788 | 15 | 60 | 10 | 15 | 0 | 1.00 | 22.00 | 0 |
| 7788 | 20 | 30 | 5 | 45 | 0 | 0.20 | 31.00 | 0 |
| 7788 | 45 | 15 | 10 | 10 | 20 | 4.00 | 41.00 | 0 |
| 7788 | 50 | 5 | 5 | 40 | 0 | 3.00 | 24.00 | 0 |
| 7788 | 70 | 0 | 5 | 25 | 0 | 3.00 | 7.00 | 0 |
| 7788 | 0 | 85 | 5 | 10 | 0 | 0.00 | 35.00 | 0 |
| 7788 | 15 | 55 | 5 | 25 | 0 | 2.50 | 40.50 | 0 |
| 7788 | 10 | 15 | 5 | 70 | 0 | 0.30 | 42.00 | 0 |
| 7788 | 5 | 10 | 10 | 60 | 15 | 1.00 | 71.00 | 0 |
| 7749 | 90 | 0 | 5 | 0 | 5 | 28.00 | 23.00 | 0 |
| 7749 | 25 | 20 | 5 | 50 | 0 | 5.50 | 36.50 | 0 |
| 7749 | 35 | 30 | 15 | 20 | 0 | 4.00 | 70.00 | 0 |
| 7749 | 15 | 25 | 5 | 55 | 0 | 5.00 | 46.50 | 0 |
| 7749 | 10 | 40 | 0 | 50 | 0 | 0.30 | 38.00 | 0 |

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|---|---|---|---|---|---|---|---|---|---|
| 7749 | 50 | 20 | 25 | 5 | 0 | 4.50 | 33.00 | 0 |
| 7772 | 10 | 20 | 20 | 50 | 0 | 0.80 | 13.00 | 0 |
| 7772 | 5 | 30 | 5 | 60 | 0 | 0.20 | 67.50 | 0 |
| 7767 | 40 | 35 | 5 | 20 | 0 | 2.50 | 59.50 | 0 |
| 7767 | 35 | 35 | 15 | 15 | 0 | 2.50 | 37.00 | 0 |
| 6431 | 15 | 20 | 10 | 30 | 25 | 0.50 | 93.00 | 0 |
| 6431 | 10 | 75 | 0 | 15 | 0 | 3.50 | 26.00 | 0 |
| 6431 | 15 | 60 | 0 | 10 | 15 | 1.00 | 71.00 | 0 |
| 6431 | 5 | 10 | 0 | 85 | 0 | 1.50 | 7.00 | 0 |
| 6431 | 20 | 75 | 0 | 5 | 0 | 0.30 | 38.00 | 0 |
| 6431 | 65 | 10 | 0 | 15 | 0 | 4.00 | 61.50 | 10 |
| 6431 | 15 | 40 | 25 | 20 | 0 | 2.00 | 49.00 | 0 |
| 6431 | 45 | 40 | 5 | 10 | 0 | 2.50 | 59.00 | 0 |
| 6541 | 15 | 35 | 5 | 45 | 0 | 1.50 | 48.00 | 0 |
| 6541 | 30 | 45 | 10 | 15 | 0 | 2.00 | 44.00 | 0 |
| 6433 | 10 | 55 | 0 | 35 | 0 | 4.50 | 50.00 | 0 |
| 6433 | 5 | 20 | 40 | 15 | 20 | 2.00 | 31.00 | 0 |
| 6434 | 20 | 45 | 30 | 5 | 0 | 1.00 | 63.00 | 0 |
| 6434 | 20 | 35 | 0 | 45 | 0 | 0.20 | 52.00 | 0 |
| 7754 | 25 | 60 | 0 | 15 | 0 | 0.20 | 30.50 | 0 |
| 7754 | 65 | 25 | 5 | 5 | 0 | 2.00 | 39.00 | 0 |
| 7754 | 20 | 60 | 0 | 20 | 0 | 0.30 | 41.00 | 0 |
| 7754 | 5 | 50 | 25 | 15 | 5 | 0.50 | 31.00 | 0 |
| 7754 | 15 | 65 | 5 | 15 | 0 | 0.30 | 61.00 | 0 |
| 7754 | 20 | 70 | 10 | 0 | 0 | 2.00 | 54.50 | 0 |
| 7754 | 15 | 40 | 10 | 35 | 0 | 2.00 | 37.00 | 0 |
| 7754 | 20 | 50 | 25 | 5 | 0 | 0.20 | 37.00 | 0 |

| Bird-ID | Litter % 10m S | Grass % 10m S | Forbs % 10m S | Bare % 10m S | Shrubs % 10m S | Litter Depth (cm) 10m S | Tallest Plant (cm) 10m S | Exotic 10m S |
|---|---|---|---|---|---|---|---|---|
| 7758 | 0 | 0 | 0 | 100 | 0 | 0.00 | 0.00 | 0 |
| 7758 | 15 | 15 | 20 | 50 | 0 | 10.00 | 15.00 | 0 |
| 6514 | 10 | 85 | 5 | 0 | 0 | 0.30 | 50.00 | 0 |
| 6514 | 15 | 25 | 10 | 50 | 0 | 0.50 | 37.00 | 0 |
| 6514 | 10 | 50 | 5 | 35 | 0 | 1.00 | 65.00 | 0 |
| 6514 | 10 | 20 | 25 | 15 | 30 | 3.50 | 52.00 | 0 |
| 5781 | 5 | 50 | 5 | 40 | 0 | 0.50 | 13.00 | 0 |
| 5781 | 60 | 10 | 10 | 15 | 5 | 2.00 | 28.00 | 0 |
| 5781 | 5 | 25 | 5 | 65 | 0 | 0.10 | 31.00 | 0 |
| 5781 | 15 | 25 | 5 | 55 | 0 | 1.00 | 6.00 | 0 |
| 7788 | 10 | 40 | 20 | 30 | 0 | 0.50 | 15.00 | 0 |
| 7788 | 10 | 25 | 10 | 50 | 5 | 1.00 | 18.00 | 0 |
| 7788 | 20 | 55 | 5 | 15 | 5 | 0.30 | 40.90 | 0 |
| 7788 | 40 | 30 | 0 | 25 | 5 | 0.50 | 39.50 | 0 |
| 7788 | 50 | 5 | 5 | 40 | 0 | 3.00 | 11.00 | 0 |
| 7788 | 85 | 0 | 10 | 5 | 0 | 1.00 | 36.50 | 0 |
| 7788 | 15 | 50 | 0 | 35 | 0 | 0.10 | 6.00 | 0 |
| 7788 | 0 | 25 | 5 | 70 | 0 | 0.00 | 39.00 | 0 |
| 7788 | 10 | 5 | 5 | 25 | 55 | 7.00 | 60.50 | 0 |
| 7788 | 10 | 5 | 5 | 80 | 0 | 5.00 | 17.00 | 0 |
| 7749 | 50 | 10 | 15 | 25 | 0 | 3.00 | 26.00 | 0 |
| 7749 | 30 | 35 | 15 | 20 | 0 | 4.00 | 10.00 | 0 |
| 7749 | 5 | 5 | 15 | 0 | 75 | 3.00 | 93.00 | 0 |
| 7749 | 35 | 45 | 0 | 20 | 0 | 2.00 | 95.00 | 0 |
| 7749 | 25 | 30 | 20 | 25 | 0 | 0.40 | 34.00 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 30 | 25 | 25 | 0 | 20 | 6.00 | 70.00 | 0 |
| 7772 | 15 | 55 | 5 | 5 | 20 | 2.00 | 64.00 | 0 |
| 7772 | 20 | 50 | 15 | 15 | 0 | 0.50 | 58.00 | 0 |
| 7767 | 30 | 65 | 0 | 5 | 10 | 6.00 | 45.00 | 0 |
| 7767 | 40 | 5 | 10 | 0 | 15 | 12.00 | 114.00 | 30 |
| 6431 | 10 | 0 | 10 | 75 | 5 | 1.00 | 65.00 | 0 |
| 6431 | 20 | 40 | 10 | 0 | 0 | 8.50 | 99.50 | 30 |
| 6431 | 25 | 50 | 5 | 15 | 5 | 2.00 | 23.00 | 0 |
| 6431 | 35 | 25 | 5 | 35 | 0 | 2.50 | 15.00 | 0 |
| 6431 | 25 | 40 | 35 | 0 | 0 | 2.00 | 64.50 | 0 |
| 6431 | 5 | 15 | 0 | 80 | 0 | 0.50 | 12.00 | 0 |
| 6431 | 5 | 15 | 10 | 70 | 0 | 0.50 | 24.00 | 0 |
| 6431 | 10 | 40 | 0 | 50 | 0 | 4.50 | 48.00 | 0 |
| 6541 | 10 | 75 | 10 | 0 | 0 | 2.00 | 31.00 | 0 |
| 6541 | 10 | 85 | 0 | 0 | 5 | 4.00 | 54.00 | 0 |
| 6433 | 35 | 25 | 0 | 35 | 5 | 5.00 | 51.00 | 0 |
| 6433 | 5 | 5 | 10 | 80 | 0 | 0.10 | 41.00 | 0 |
| 6434 | 25 | 55 | 20 | 0 | 0 | 4.00 | 47.50 | 0 |
| 6434 | 5 | 50 | 0 | 45 | 0 | 0.50 | 24.00 | 0 |
| 7754 | 5 | 30 | 0 | 65 | 0 | 0.30 | 18.00 | 0 |
| 7754 | 90 | 5 | 5 | 0 | 0 | 3.00 | 43.00 | 0 |
| 7754 | 50 | 50 | 0 | 0 | 0 | 1.00 | 22.00 | 0 |
| 7754 | 10 | 50 | 5 | 35 | 0 | 1.00 | 95.50 | 0 |
| 7754 | 25 | 45 | 20 | 10 | 0 | 2.00 | 36.00 | 0 |
| 7754 | 15 | 60 | 20 | 5 | 0 | 4.50 | 122.00 | 0 |
| 7754 | 25 | 30 | 15 | 30 | 0 | 0.10 | 39.50 | 0 |
| 7754 | 20 | 60 | 5 | 15 | 0 | 0.20 | 29.00 | 0 |

| Bird-ID | Litter % 10m W | Grass % 10m W | Forbs % 10m W | Bare % 10m W | Shrubs % 10m W | Litter Depth (cm) 10m W | Tallest Plant (cm) 10m W | Exotic 10m W |
|---|---|---|---|---|---|---|---|---|
| 7758 | 10 | 40 | 5 | 45 | 0 | 0.10 | 9.00 | 0 |
| 7758 | 5 | 40 | 15 | 30 | 10 | 0.10 | 41.00 | 0 |
| 6514 | 35 | 20 | 20 | 0 | 25 | 9.00 | 66.00 | 0 |
| 6514 | 10 | 35 | 40 | 15 | 0 | 0.10 | 65.00 | 0 |
| 6514 | 20 | 75 | 5 | 0 | 0 | 6.00 | 106.00 | 0 |
| 6514 | 35 | 25 | 10 | 30 | 0 | 2.50 | 25.00 | 0 |
| 5781 | 10 | 50 | 35 | 0 | 0 | 3.00 | 62.00 | 5 |
| 5781 | 0 | 0 | 5 | 95 | 0 | 0.00 | 1.00 | 0 |
| 5781 | 20 | 20 | 0 | 40 | 70 | 0.20 | 50.00 | 0 |
| 5781 | 40 | 10 | 5 | 45 | 0 | 0.50 | 9.50 | 0 |
| 7788 | 10 | 35 | 0 | 50 | 5 | 0.10 | 11.50 | 0 |
| 7788 | 50 | 35 | 10 | 5 | 0 | 3.50 | 65.00 | 0 |
| 7788 | 20 | 25 | 25 | 30 | 0 | 1.00 | 19.00 | 0 |
| 7788 | 60 | 10 | 20 | 10 | 0 | 2.00 | 64.00 | 0 |
| 7788 | 80 | 0 | 10 | 10 | 0 | 4.00 | 33.00 | 0 |
| 7788 | 75 | 5 | 5 | 15 | 0 | 3.00 | 13.00 | 0 |
| 7788 | 0 | 75 | 0 | 25 | 0 | 0.00 | 68.00 | 0 |
| 7788 | 45 | 30 | 5 | 20 | 0 | 2.00 | 44.50 | 0 |
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 10 | 5 | 10 | 75 | 0 | 6.00 | 36.00 | 0 |
| 7749 | 35 | 40 | 10 | 10 | 5 | 8.50 | 70.00 | 0 |
| 7749 | 10 | 70 | 10 | 10 | 0 | 0.50 | 65.00 | 0 |
| 7749 | 5 | 40 | 30 | 0 | 25 | 0.50 | 76.50 | 0 |
| 7749 | 15 | 40 | 15 | 30 | 0 | 2.00 | 82.50 | 0 |
| 7749 | 5 | 25 | 0 | 70 | 0 | 0.10 | 18.50 | 0 |

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|---|---|---|---|---|---|---|---|---|
| 7749 | 20 | 60 | 15 | 5 | 0 | 3.50 | 96.00 | 0 |
| 7772 | 5 | 60 | 25 | 10 | 0 | 2.00 | 62.00 | 0 |
| 7772 | 15 | 30 | 5 | 10 | 40 | 2.00 | 59.00 | 0 |
| 7767 | 30 | 50 | 15 | 5 | 0 | 3.00 | 27.50 | 0 |
| 7767 | 15 | 5 | 10 | 0 | 70 | 13.00 | 57.00 | 0 |
| 6431 | 10 | 20 | 20 | 10 | 40 | 0.10 | 60.50 | 0 |
| 6431 | 10 | 20 | 5 | 40 | 25 | 2.50 | 59.00 | 0 |
| 6431 | 0 | 10 | 0 | 5 | 85 | 0.00 | 83.00 | 0 |
| 6431 | 60 | 30 | 5 | 0 | 5 | 5.00 | 20.00 | 0 |
| 6431 | 5 | 65 | 5 | 25 | 0 | 0.50 | 40.00 | 0 |
| 6431 | 10 | 40 | 0 | 50 | 0 | 7.50 | 19.50 | 0 |
| 6431 | 20 | 60 | 0 | 20 | 0 | 2.00 | 53.00 | 0 |
| 6431 | 85 | 10 | 0 | 0 | 0 | 18.00 | 44.00 | 5 |
| 6541 | 10 | 10 | 25 | 10 | 45 | 1.50 | 61.50 | 0 |
| 6541 | 20 | 45 | 25 | 5 | 5 | 5.00 | 44.00 | 0 |
| 6433 | 10 | 70 | 5 | 10 | 5 | 3.00 | 88.00 | 0 |
| 6433 | 5 | 20 | 25 | 10 | 40 | 0.50 | 70.00 | 0 |
| 6434 | 10 | 30 | 30 | 5 | 25 | 1.00 | 78.00 | 0 |
| 6434 | 25 | 35 | 15 | 20 | 10 | 1.50 | 40.50 | 0 |
| 7754 | 10 | 85 | 0 | 5 | 0 | 0.10 | 20.00 | 0 |
| 7754 | 10 | 75 | 5 | 10 | 0 | 1.00 | 31.00 | 0 |
| 7754 | 40 | 50 | 0 | 10 | 0 | 1.00 | 34.00 | 0 |
| 7754 | 10 | 45 | 15 | 30 | 0 | 0.20 | 44.00 | 0 |
| 7754 | 30 | 65 | 0 | 5 | 0 | 2.00 | 80.00 | 0 |
| 7754 | 25 | 65 | 10 | 0 | 0 | 1.00 | 29.00 | 0 |
| 7754 | 10 | 40 | 0 | 50 | 0 | 0.20 | 36.00 | 0 |
| 7754 | 25 | 75 | 0 | 0 | 0 | 1.50 | 48.00 | 0 |

| Bird-ID | Litter % 15m N | Grass % 15m N | Forbs % 15m N | Bare % 15m N | Shrubs % 15m N | Litter Depth (cm) 15m N | Tallest Plant (cm) 15m N | Exotic 15m N |
|---|---|---|---|---|---|---|---|---|
| 7758 | 5 | 55 | 10 | 5 | 25 | 0.10 | 60.20 | 0 |
| 7758 | 30 | 25 | 20 | 25 | 0 | 0.50 | 22.50 | 0 |
| 6514 | 10 | 25 | 0 | 60 | 5 | 0.10 | 10.00 | 0 |
| 6514 | 5 | 65 | 5 | 5 | 20 | 0.20 | 51.00 | 0 |
| 6514 | 5 | 45 | 5 | 45 | 0 | 0.10 | 23.00 | 0 |
| 6514 | 35 | 30 | 15 | 20 | 0 | 10.00 | 83.50 | 0 |
| 5781 | 30 | 40 | 30 | 0 | 0 | 0.50 | 110.00 | 0 |
| 5781 | 45 | 20 | 30 | 5 | 0 | 4.00 | 49.00 | 0 |
| 5781 | 65 | 5 | 5 | 0 | 25 | 21.50 | 59.00 | 0 |
| 5781 | 60 | 30 | 5 | 5 | 0 | 2.00 | 21.50 | 0 |
| 7788 | 15 | 30 | 5 | 50 | 0 | 0.30 | 9.00 | 0 |
| 7788 | 5 | 40 | 5 | 50 | 0 | 0.50 | 52.50 | 0 |
| 7788 | 10 | 40 | 5 | 45 | 0 | 0.10 | 14.50 | 0 |
| 7788 | 15 | 10 | 10 | 65 | 0 | 0.50 | 13.00 | 0 |
| 7788 | 95 | 5 | 0 | 0 | 0 | 5.00 | 20.00 | 0 |
| 7788 | 20 | 5 | 5 | 70 | 0 | 1.50 | 19.50 | 0 |
| 7788 | 30 | 45 | 0 | 25 | 0 | 1.00 | 17.50 | 0 |
| 7788 | 0 | 65 | 0 | 35 | 0 | 0.00 | 170.00 | 0 |
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 0 | 10 | 10 | 80 | 0 | 0.00 | 17.00 | 0 |
| 7749 | 35 | 30 | 15 | 20 | 0 | 3.00 | 59.00 | 0 |
| 7749 | 30 | 50 | 10 | 10 | 0 | 5.00 | 66.00 | 0 |
| 7749 | 10 | 10 | 10 | 10 | 60 | 4.00 | 83.00 | 0 |
| 7749 | 15 | 20 | 15 | 40 | 10 | 0.20 | 80.00 | 0 |
| 7749 | 5 | 40 | 15 | 40 | 0 | 0.10 | 19.00 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7749 | 0 | 15 | 20 | 5 | 60 | 0.00 | 72.50 | 0 |
| 7772 | 5 | 40 | 0 | 50 | 5 | 0.50 | 32.50 | 0 |
| 7772 | 10 | 5 | 10 | 0 | 75 | 7.50 | 127.00 | 0 |
| 7767 | 35 | 20 | 15 | 30 | 0 | 0.50 | 13.50 | 0 |
| 7767 | 15 | 5 | 0 | 5 | 75 | 3.00 | 67.00 | 0 |
| 6431 | 10 | 75 | 10 | 5 | 0 | 3.00 | 55.00 | 0 |
| 6431 | 5 | 0 | 0 | 95 | 0 | 0.20 | 0.00 | 0 |
| 6431 | 5 | 30 | 10 | 25 | 30 | 0.20 | 90.40 | 0 |
| 6431 | 60 | 15 | 0 | 25 | 0 | 4.00 | 13.00 | 0 |
| 6431 | 10 | 35 | 10 | 45 | 0 | 1.00 | 64.50 | 0 |
| 6431 | 5 | 45 | 5 | 45 | 0 | 0.50 | 14.00 | 0 |
| 6431 | 5 | 50 | 10 | 35 | 0 | 1.50 | 23.50 | 0 |
| 6431 | 0 | 45 | 35 | 20 | 0 | 0.00 | 64.00 | 0 |
| 6541 | 30 | 40 | 15 | 0 | 15 | 3.50 | 71.50 | 0 |
| 6541 | 35 | 25 | 30 | 10 | 0 | 3.50 | 38.00 | 0 |
| 6433 | 25 | 25 | 5 | 45 | 0 | 3.00 | 61.50 | 0 |
| 6433 | 20 | 10 | 25 | 5 | 40 | 2.00 | 51.00 | 0 |
| 6434 | 20 | 65 | 10 | 5 | 0 | 2.50 | 62.00 | 0 |
| 6434 | 40 | 50 | 5 | 5 | 0 | 0.20 | 42.00 | 0 |
| 7754 | 10 | 45 | 20 | 25 | 0 | 0.20 | 39.00 | 0 |
| 7754 | 55 | 25 | 5 | 15 | 0 | 0.50 | 30.00 | 0 |
| 7754 | 25 | 65 | 10 | 0 | 0 | 0.30 | 42.00 | 0 |
| 7754 | 30 | 25 | 30 | 15 | 0 | 2.00 | 41.50 | 0 |
| 7754 | 10 | 75 | 5 | 5 | 5 | 0.20 | 52.00 | 0 |
| 7754 | 20 | 60 | 20 | 0 | 0 | 31.00 | 56.00 | 0 |
| 7754 | 10 | 60 | 10 | 20 | 0 | 1.00 | 57.00 | 0 |
| 7754 | 10 | 80 | 5 | 5 | 0 | 1.00 | 61.00 | 0 |

| Bird-ID | Litter % 15m E | Grass % 15m E | Forbs % 15m E | Bare % 15m E | Shrubs % 15m E | Litter Depth (cm) 15m E | Tallest Plant (cm) 15m E | Exotic 15m E |
|---|---|---|---|---|---|---|---|---|
| 7758 | 55 | 20 | 15 | 10 | 0 | 6.00 | 25.00 | 0 |
| 7758 | 25 | 55 | 15 | 5 | 0 | 17.00 | 38.00 | 0 |
| 6514 | 25 | 60 | 10 | 5 | 0 | 3.00 | 36.50 | 0 |
| 6514 | 5 | 35 | 10 | 0 | 50 | 5.00 | 65.00 | 0 |
| 6514 | 20 | 0 | 40 | 15 | 0 | 0.20 | 28.00 | 0 |
| 6514 | 10 | 10 | 20 | 20 | 20 | 0.10 | 56.00 | 0 |
| 5781 | 20 | 45 | 25 | 0 | 0 | 9.00 | 129.00 | 0 |
| 5781 | 30 | 30 | 10 | 30 | 0 | 2.50 | 38.00 | 0 |
| 5781 | 75 | 0 | 0 | 0 | 25 | 23.00 | 60.00 | 0 |
| 5781 | 25 | 25 | 25 | 25 | 0 | 50.00 | 25.00 | 0 |
| 7788 | 10 | 35 | 5 | 50 | 0 | 0.10 | 33.00 | 0 |
| 7788 | 20 | 10 | 0 | 35 | 35 | 7.00 | 45.20 | 0 |
| 7788 | 10 | 25 | 0 | 60 | 5 | 0.50 | 19.50 | 0 |
| 7788 | 25 | 20 | 15 | 40 | 0 | 0.20 | 21.00 | 0 |
| 7788 | 25 | 0 | 35 | 40 | 0 | 2.50 | 22.00 | 0 |
| 7788 | 60 | 0 | 5 | 35 | 0 | 2.00 | 15.00 | 0 |
| 7788 | 10 | 60 | 0 | 30 | 0 | 0.10 | 11.50 | 0 |
| 7788 | 5 | 30 | 15 | 50 | 10 | 0.20 | 60.40 | 0 |
| 7788 | 30 | 30 | 0 | 40 | 0 | 6.00 | 30.30 | 0 |
| 7788 | 20 | 15 | 10 | 55 | 0 | 4.50 | 68.50 | 0 |
| 7749 | 20 | 20 | 10 | 50 | 0 | 2.00 | 41.50 | 0 |
| 7749 | 10 | 75 | 10 | 5 | 0 | 0.50 | 64.50 | 0 |
| 7749 | 35 | 35 | 5 | 10 | 15 | 3.50 | 81.00 | 0 |
| 7749 | 30 | 15 | 5 | 45 | 5 | 1.50 | 27.50 | 0 |
| 7749 | 5 | 45 | 40 | 10 | 0 | 2.00 | 63.00 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7749 | 10 | 5 | 50 | 25 | 0 | 2.50 | 83.00 | 0 |
| 7772 | 5 | 30 | 15 | 40 | 10 | 2.00 | 29.00 | 0 |
| 7772 | 5 | 25 | 5 | 70 | 0 | 0.20 | 41.50 | 0 |
| 7767 | 30 | 50 | 15 | 5 | 0 | 5.50 | 66.50 | 0 |
| 7767 | 20 | 0 | 5 | 0 | 75 | 7.00 | 90.00 | 0 |
| 6431 | 10 | 40 | 10 | 40 | 0 | 0.30 | 36.00 | 0 |
| 6431 | 25 | 30 | 0 | 45 | 0 | 9.00 | 26.50 | 0 |
| 6431 | 35 | 35 | 0 | 30 | 0 | 3.00 | 32.00 | 0 |
| 6431 | 25 | 20 | 25 | 30 | 0 | 2.00 | 29.00 | 0 |
| 6431 | 25 | 0 | 0 | 25 | 45 | 3.00 | 78.00 | 5 |
| 6431 | 55 | 20 | 10 | 15 | 0 | 4.00 | 24.00 | 0 |
| 6431 | 15 | 10 | 10 | 10 | 55 | 1.00 | 81.00 | 0 |
| 6431 | 20 | 55 | 5 | 15 | 5 | 2.50 | 60.00 | 0 |
| 6541 | 15 | 30 | 10 | 45 | 0 | 24.00 | 39.00 | 0 |
| 6541 | 15 | 45 | 10 | 30 | 0 | 0.50 | 33.00 | 0 |
| 6433 | 15 | 40 | 5 | 40 | 0 | 4.00 | 60.00 | 0 |
| 6433 | 5 | 5 | 25 | 0 | 65 | 8.00 | 87.50 | 0 |
| 6434 | 10 | 55 | 15 | 20 | 0 | 1.00 | 60.00 | 0 |
| 6434 | 5 | 80 | 15 | 0 | 0 | 3.50 | 73.00 | 0 |
| 7754 | 15 | 85 | 0 | 0 | 0 | 0.50 | 25.00 | 0 |
| 7754 | 70 | 30 | 0 | 0 | 0 | 10.00 | 36.00 | 0 |
| 7754 | 25 | 35 | 35 | 5 | 0 | 1.00 | 52.00 | 0 |
| 7754 | 15 | 35 | 25 | 25 | 0 | 0.20 | 50.00 | 0 |
| 7754 | 25 | 70 | 5 | 0 | 0 | 3.00 | 89.00 | 0 |
| 7754 | 30 | 65 | 5 | 0 | 0 | 3.50 | 60.00 | 0 |
| 7754 | 15 | 65 | 0 | 20 | 0 | 0.30 | 19.00 | 0 |
| 7754 | 10 | 75 | 10 | 5 | 0 | 0.10 | 36.00 | 0 |

| Bird-ID | Litter % 15m S | Grass % 15m S | Forbs % 15m S | Bare % 15m S | Shrubs % 15m S | Litter Depth (cm) 15m S | Tallest Plant (cm) 15m S | Exotic 15m S |
|---|---|---|---|---|---|---|---|---|
| 7758 | 20 | 20 | 5 | 55 | 0 | 0.20 | 70.00 | 0 |
| 7758 | 5 | 20 | 20 | 55 | 0 | 0.20 | 14.00 | 0 |
| 6514 | 5 | 20 | 0 | 75 | 0 | 0.10 | 7.00 | 0 |
| 6514 | 45 | 0 | 20 | 15 | 20 | 3.00 | 66.00 | 0 |
| 6514 | 20 | 65 | 0 | 15 | 0 | 3.00 | 16.50 | 0 |
| 6514 | 50 | 10 | 15 | 25 | 0 | 9.50 | 23.00 | 0 |
| 5781 | 10 | 35 | 25 | 30 | 0 | 3.00 | 53.00 | 0 |
| 5781 | 60 | 10 | 15 | 15 | 0 | 1.00 | 19.00 | 0 |
| 5781 | 60 | 10 | 5 | 15 | 10 | 1.00 | 32.00 | 0 |
| 5781 | 10 | 15 | 10 | 65 | 0 | 0.80 | 5.50 | 0 |
| 7788 | 15 | 30 | 25 | 20 | 10 | 19.00 | 85.00 | 0 |
| 7788 | 30 | 55 | 10 | 5 | 0 | 9.00 | 73.00 | 0 |
| 7788 | 25 | 15 | 5 | 50 | 5 | 2.50 | 26.00 | 0 |
| 7788 | 10 | 35 | 5 | 50 | 0 | 0.10 | 18.00 | 0 |
| 7788 | 60 | 20 | 20 | 0 | 0 | 15.00 | 20.00 | 0 |
| 7788 | 40 | 0 | 5 | 55 | 0 | 2.00 | 15.00 | 0 |
| 7788 | 10 | 45 | 0 | 45 | 0 | 0.10 | 5.50 | 0 |
| 7788 | 10 | 50 | 0 | 40 | 0 | 0.10 | 14.00 | 0 |
| 7788 | 10 | 10 | 25 | 55 | 0 | 2.00 | 10.00 | 0 |
| 7788 | 5 | 5 | 10 | 80 | 0 | 2.00 | 50.00 | 0 |
| 7749 | 60 | 30 | 5 | 5 | 0 | 2.50 | 13.00 | 0 |
| 7749 | 30 | 60 | 5 | 5 | 0 | 3.50 | 82.00 | 0 |
| 7749 | 55 | 20 | 10 | 15 | 0 | 3.30 | 37.50 | 0 |
| 7749 | 25 | 40 | 30 | 0 | 5 | 5.00 | 75.50 | 0 |
| 7749 | 40 | 20 | 15 | 25 | 0 | 7.00 | 39.50 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7749 | 40 | 5 | 15 | 30 | 10 | 7.50 | 34.00 | 0 |
| 7772 | 30 | 25 | 10 | 20 | 15 | 1.50 | 51.00 | 0 |
| 7772 | 20 | 15 | 25 | 35 | 5 | 2.50 | 49.00 | 0 |
| 7767 | 25 | 65 | 10 | 0 | 10 | 7.00 | 46.50 | 0 |
| 7767 | 40 | 20 | 15 | 15 | 10 | 7.00 | 116.00 | 0 |
| 6431 | 5 | 0 | 0 | 95 | 0 | 0.50 | 0.00 | 0 |
| 6431 | 20 | 50 | 0 | 30 | 0 | 5.50 | 20.50 | 0 |
| 6431 | 35 | 20 | 5 | 40 | 0 | 1.00 | 16.00 | 0 |
| 6431 | 15 | 25 | 5 | 55 | 0 | 1.00 | 15.00 | 0 |
| 6431 | 20 | 20 | 40 | 20 | 0 | 1.00 | 41.00 | 0 |
| 6431 | 65 | 10 | 0 | 25 | 0 | 3.00 | 13.00 | 0 |
| 6431 | 10 | 50 | 0 | 30 | 10 | 1.00 | 49.50 | 0 |
| 6431 | 15 | 45 | 0 | 40 | 0 | 2.00 | 52.00 | 0 |
| 6541 | 15 | 60 | 5 | 20 | 0 | 1.00 | 64.50 | 10 |
| 6541 | 15 | 35 | 20 | 30 | 0 | 3.00 | 64.00 | 0 |
| 6433 | 10 | 60 | 5 | 10 | 15 | 6.00 | 69.00 | 0 |
| 6433 | 5 | 40 | 5 | 20 | 30 | 0.50 | 61.00 | 0 |
| 6434 | 10 | 40 | 5 | 5 | 40 | 0.20 | 46.00 | 0 |
| 6434 | 5 | 30 | 5 | 65 | 5 | 0.20 | 30.50 | 0 |
| 7754 | 10 | 80 | 0 | 10 | 0 | 1.50 | 36.00 | 0 |
| 7754 | 65 | 25 | 10 | 0 | 0 | 2.00 | 42.00 | 0 |
| 7754 | 40 | 50 | 0 | 5 | 0 | 2.00 | 32.00 | 5 |
| 7754 | 55 | 35 | 0 | 5 | 5 | 2.00 | 54.00 | 0 |
| 7754 | 30 | 40 | 5 | 25 | 0 | 2.00 | 79.00 | 0 |
| 7754 | 50 | 5 | 25 | 20 | 0 | 2.00 | 70.50 | 0 |
| 7754 | 15 | 75 | 10 | 0 | 0 | 3.50 | 35.00 | 0 |
| 7754 | 15 | 50 | 0 | 0 | 0 | 3.00 | 53.00 | 35 |

| Bird-ID | Litter % 15m W | Grass % 15m W | Forbs % 15m W | Bare % 15m W | Shrubs % 15m W | Litter Depth (cm) 15m W | Tallest Plant (cm) 15m W | Exotic 15m W |
|---|---|---|---|---|---|---|---|---|
| 7758 | 5 | 35 | 0 | 60 | 0 | 0.20 | 11.00 | 0 |
| 7758 | 5 | 20 | 20 | 55 | 0 | 0.10 | 7.00 | 0 |
| 6514 | 40 | 30 | 25 | 5 | 0 | 2.00 | 40.50 | 0 |
| 6514 | 0 | 40 | 5 | 45 | 10 | 0.00 | 43.00 | 0 |
| 6514 | 50 | 30 | 5 | 0 | 15 | 2.00 | 26.00 | 0 |
| 6514 | 15 | 35 | 50 | 0 | 0 | 2.50 | 86.00 | 0 |
| 5781 | 10 | 20 | 5 | 65 | 0 | 0.20 | 6.00 | 0 |
| 5781 | 80 | 10 | 10 | 0 | 0 | 3.00 | 27.00 | 0 |
| 5781 | 25 | 50 | 15 | 10 | 0 | 0.50 | 22.00 | 0 |
| 5781 | 40 | 10 | 10 | 40 | 0 | 4.00 | 9.00 | 0 |
| 7788 | 50 | 10 | 10 | 30 | 0 | 17.00 | 19.00 | 0 |
| 7788 | 35 | 35 | 5 | 25 | 0 | 6.50 | 96.50 | 0 |
| 7788 | 30 | 30 | 5 | 35 | 0 | 2.00 | 17.00 | 0 |
| 7788 | 10 | 20 | 5 | 65 | 0 | 1.50 | 15.50 | 0 |
| 7788 | 20 | 0 | 10 | 70 | 0 | 1.00 | 13.50 | 0 |
| 7788 | 70 | 0 | 15 | 25 | 0 | 4.00 | 31.50 | 0 |
| 7788 | 10 | 40 | 0 | 50 | 0 | 1.00 | 40.00 | 0 |
| 7788 | 5 | 30 | 0 | 65 | 0 | 1.00 | 13.50 | 0 |
| 7788 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7788 | 0 | 5 | 5 | 85 | 5 | 0.00 | 42.00 | 0 |
| 7749 | 40 | 20 | 10 | 30 | 0 | 4.50 | 31.00 | 0 |
| 7749 | 30 | 40 | 5 | 25 | 0 | 0.50 | 36.00 | 0 |
| 7749 | 10 | 45 | 15 | 5 | 25 | 2.00 | 72.00 | 0 |
| 7749 | 0 | 0 | 5 | 95 | 0 | 0.00 | 5.00 | 0 |
| 7749 | 0 | 15 | 5 | 80 | 0 | 0.00 | 26.50 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7749 | 25 | 10 | 20 | 35 | 10 | 1.50 | 34.50 | 0 |
| 7772 | 5 | 20 | 15 | 60 | 0 | 0.20 | 23.00 | 0 |
| 7772 | 40 | 40 | 10 | 10 | 0 | 3.50 | 43.00 | 0 |
| 7767 | 40 | 40 | 0 | 20 | 0 | 15.50 | 26.50 | 0 |
| 7767 | 20 | 20 | 40 | 5 | 0 | 5.50 | 38.00 | 0 |
| 6431 | 5 | 45 | 5 | 10 | 35 | 0.10 | 78.00 | 0 |
| 6431 | 55 | 25 | 10 | 5 | 5 | 3.00 | 40.00 | 0 |
| 6431 | 20 | 40 | 0 | 0 | 40 | 9.00 | 68.00 | 0 |
| 6431 | 55 | 45 | 0 | 0 | 0 | 4.00 | 16.00 | 0 |
| 6431 | 5 | 65 | 5 | 25 | 0 | 0.20 | 63.50 | 0 |
| 6431 | 10 | 10 | 0 | 0 | 80 | 5.00 | 101.00 | 0 |
| 6431 | 10 | 50 | 0 | 40 | 0 | 0.20 | 32.50 | 0 |
| 6431 | 35 | 20 | 0 | 45 | 0 | 3.00 | 37.00 | 0 |
| 6541 | 15 | 80 | 0 | 0 | 5 | 2.00 | 50.00 | 0 |
| 6541 | 40 | 40 | 10 | 0 | 10 | 5.00 | 48.50 | 0 |
| 6433 | 15 | 35 | 0 | 50 | 0 | 0.20 | 33.00 | 0 |
| 6433 | 20 | 20 | 30 | 25 | 5 | 1.00 | 63.50 | 0 |
| 6434 | 20 | 70 | 10 | 0 | 0 | 2.00 | 78.00 | 0 |
| 6434 | 5 | 25 | 20 | 50 | 0 | 0.20 | 51.50 | 0 |
| 7754 | 20 | 80 | 0 | 0 | 0 | 2.00 | 41.00 | 0 |
| 7754 | 15 | 80 | 0 | 5 | 0 | 0.20 | 58.00 | 0 |
| 7754 | 15 | 50 | 0 | 35 | 0 | 0.10 | 32.00 | 0 |
| 7754 | 10 | 40 | 10 | 40 | 0 | 1.00 | 92.50 | 0 |
| 7754 | 25 | 40 | 5 | 0 | 30 | 1.00 | 100.00 | 0 |
| 7754 | 10 | 70 | 5 | 15 | 0 | 0.40 | 44.00 | 0 |
| 7754 | 10 | 75 | 0 | 15 | 0 | 0.40 | 68.00 | 0 |
| 7754 | 10 | 65 | 0 | 25 | 0 | 0.20 | 37.00 | 0 |

***Table 22. AIC Table from Logistic Regression Analysis of Brood Site Selection Characteristics (n=24) by Scaled Quail (Callipepla squamata) Broods in the Southern High Plains of Texas (April 1 – August 15) 2020, Temperatures = (Mean Temperature = Recorded by ibuttons at brood site, Maxmimum Temperature = Recorded by ibuttons at brood site, Increments = Number of temperature increments at brood site >45° C), Ground Cover Measurements (%) at 0, 1, 5, 10, and 15 m***

| Model | K | AICc | Delta_AICc | AICcWt | Cum.Wt | LL |
|---|---|---|---|---|---|---|
| Temperatures | 3 | 26.39 | 0 | 0.5 | 0.5 | -9.92 |
| Max Temp and shrub | 3 | 26.43 | 0.04 | 0.5 | 1 | -9.94 |
| Percent grass among all transects | 6 | 48.21 | 21.82 | 0 | 1 | -17.17 |
| Ground cover percentages at 1 m | 7 | 53.41 | 27.02 | 0 | 1 | -18.43 |
| Percent shrub among all transects | 6 | 60.36 | 33.97 | 0 | 1 | -23.25 |
| Percent bare ground among all transects | 6 | 60.93 | 34.54 | 0 | 1 | -23.53 |
| Ground cover percentages at point center | 5 | 61.41 | 35.02 | 0 | 1 | -25.05 |
| Percent litter among all transects | 6 | 72.81 | 46.42 | 0 | 1 | -29.47 |
| Percent forb among all transects | 6 | 74.16 | 47.77 | 0 | 1 | -30.15 |
| Null | 1 | 74.17 | 47.77 | 0 | 1 | -36.04 |
| Ground cover percentages at 15 m | 5 | 78.62 | 52.23 | 0 | 1 | -33.66 |
| Ground cover percentages at 10 m | 5 | 78.91 | 52.51 | 0 | 1 | -33.8 |
| Ground cover percentages at 5 m | 5 | 80.68 | 54.29 | 0 | 1 | -34.69 |

***Table 23. Output from Top Logistic Regression Model Assessment of 2020 (April 1 – August 15) Brood Site Selection Characteristics (n=24) of Scaled Quail (Callipepla squamata) Broods in the Southern High Plains of Texas, Mean Temperature = Recorded by ibuttons at brood site, Maximum Temperature = Recorded by ibuttons at brood site, Increments = Number of temperature increments at brood site >45° C), % Grass = Percent grass cover at point center***

| Variable | Beta | 90th CI Lower | 90th CI Upper |
|---|---|---|---|
| (Intercept) | 65.31 | 11.81 | 118.81 |
| Mean Temperature | -2.92 | -4.68 | -1.16 |
| Max Temperature | 0.03 | -0.49 | 0.55 |
| %Grass | -9.72 | -14.98 | -4.46 |

*Table 24. Scaled Quail (Callipepla squamata) Brood Survival Estimates (n=12) (April 1 – August 15) 2020 Season in the Southern High Plains of Texas, Mean Temperature = Recorded at brood site with ibuttons, Maximum Temperature = Recorded at brood site with ibuttons, Increments = Number of 30-minute increments where temperature >45° C , Hot Days = Number of hot days where ambient temperature >40C collected from West Texas Mesonet, Precipitation = Amount of precipitation that fell during each individual brood survival period collected from West Texas, Total area (ha), Percent landscape (%), Largest patch (ha), 50 m radius of brood site (%)*

| Model | $AIC_c$ | $\Delta AIC_c$ | $\omega_i$ | Likelihood | K |
|---|---|---|---|---|---|
| Weather Variables | 53.01 | 0.00 | 1.00 | 1 | 5 |
| Total Area, Percent Landscape, Largest Patch of Bare Ground | 73.34 | 20.33 | 0.00 | 0 | 4 |
| Visual Obstruction of Grass | 74.61 | 21.60 | 0.00 | 0 | 3 |
| 50 m Radius, Total Area, Percent Landscape, Largest Patch of Woody Vegetation | 74.63 | 21.61 | 0.00 | 0 | 5 |
| Visual Obstruction of Grass and Shrubs | 75.22 | 22.21 | 0.00 | 0 | 5 |
| Total Area, Percent Landscape, Largest Patch of Succulents | 76.83 | 23.82 | 0.00 | 0 | 2 |
| Null | 78.41 | 25.40 | 0.00 | 0 | 1 |



*Table 25. Accuracy Assessment Results for 8 Maximum Likelihood Classified Images of the Study Site in the Southern High Plains of Texas*

| Accuracy Assessment 2019 (1) | Class Name | Reference Totals | Classified Totals | # Correct | Producer's Accuracy | User's Accuracy |
|---|---|---|---|---|---|---|
| | Cholla | 66 | 51 | 34 | 66.67 | 51.52 |
| | Yucca | 96 | 51 | 46 | 90.20 | 47.92 |
| | Bare Ground | 49 | 51 | 48 | 94.12 | 97.96 |
| | Herbaceous Shrub | 47 | 51 | 22 | 43.14 | 46.81 |
| | Grassland | 89 | 135 | 72 | 53.33 | 80.90 |
| | Woody Vegetation | 43 | 51 | 37 | 72.55 | 86.05 |
| | Totals: | 390 | 390 | 43 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Overall Classification Accuracy: 85.76% | | | | | | |
| Kappa Coefficient: 0.590 | | | | | | |
| 2019 (2) | | | | | | |
| | Cholla | 73 | 51 | 48 | 94.12 | 65.75 |
| | Yucca | 82 | 50 | 41 | 82.00 | 50.00 |
| | Bare Ground | 50 | 52 | 50 | 96.15 | 100.00 |
| | Herbaceous Shrub | 37 | 49 | 21 | 42.86 | 56.76 |
| | Grassland | 34 | 49 | 15 | 30.61 | 44.12 |
| | Woody Vegetation | 26 | 51 | 18 | 35.29 | 69.23 |
| | Totals: | 302 | 302 | 32 | | |
| Overall Classification Accuracy: 63.91% | | | | | | |
| Kappa Coefficient: 0.562 | | | | | | |
| 2019 (3) | | | | | | |
| | Cholla | 43 | 51 | 35 | 68.63 | 81.40 |
| | Yucca | 63 | 51 | 36 | 70.59 | 57.14 |
| | Bare Ground | 48 | 51 | 48 | 94.12 | 100.00 |
| | Herbaceous Shrub | 50 | 51 | 37 | 72.55 | 74.00 |
| | Grassland | 66 | 51 | 37 | 72.55 | 56.06 |
| | Woody Vegetation | 36 | 51 | 32 | 62.75 | 88.89 |
| | Totals: | 306 | 306 | 38 | | |
| Overall Classification Accuracy: 73.53% | | | | | | |
| Kappa Coefficient: 0.643 | | | | | | |
| 2020 (1) | | | | | | |
| | Cholla | 43 | 51 | 21 | 41.18 | 48.84 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Yucca | 44 | 50 | 25 | 50.00 | 56.82 |
| | Bare Ground | 44 | 51 | 44 | 86.27 | 100.00 |
| | Herbaceous Shrub | 29 | 49 | 18 | 36.73 | 62.07 |
| | Grassland | 76 | 51 | 20 | 39.22 | 26.32 |
| | Woody Vegetation | 65 | 49 | 44 | 89.80 | 67.69 |
| | Totals: | 301 | 301 | 29 | | |
| Overall Classification Accuracy: 57.14% | | | | | | |
| Kappa Coefficient: 0.486 | | | | | | |
| 2020 (2) | | | | | | |
| | Succulents/Grassland | 183 | 171 | 137 | 80.12 | 74.86 |
| | Bare Ground | 32 | 50 | 28 | 56.00 | 87.50 |
| | Herbaceous Shrub | 45 | 50 | 23 | 46.00 | 51.11 |
| | Woody Vegetation | 65 | 52 | 33 | 63.46 | 50.77 |
| | Structures | 47 | 49 | 32 | 65.31 | 68.09 |
| | Totals: | 372 | 372 | 51 | | |
| Overall Classification Accuracy: 68.01% | | | | | | |
| Kappa Coefficient: 0.546 | | | | | | |
| 2020 (3) | | | | | | |
| | Cholla | 59 | 54 | 26 | 48.15 | 44.07 |
| | Yucca | 63 | 53 | 39 | 73.58 | 61.90 |
| | Bare Ground | 48 | 51 | 48 | 94.12 | 100.00 |
| | Herbaceous Shrub | 9 | 51 | 6 | 11.76 | 66.67 |
| | Grassland | 119 | 88 | 61 | 69.32 | 51.26 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Woody Vegetation | 54 | 55 | 38 | 69.09 | 70.37 |
| | Totals: | 352 | 352 | 36 | | |
| Overall Classification Accuracy: 72.43% Kappa Coefficient: 0.533 | | | | | | |
| 2020 (4) | | | | | | |
| | Cholla | 30 | 51 | 12 | 23.53 | 40.00 |
| | Yucca | 69 | 50 | 39 | 78.00 | 56.52 |
| | Bare Ground | 47 | 50 | 47 | 94.00 | 100.00 |
| | Herbaceous Shrub | 28 | 49 | 8 | 16.33 | 28.57 |
| | Grassland | 68 | 53 | 25 | 47.17 | 36.76 |
| | Woody Vegetation | 61 | 50 | 40 | 80.00 | 65.57 |
| | Totals: | 303 | 303 | 29 | | |
| Overall Classification Accuracy: 56.44% Kappa Coefficient: 0.477 | | | | | | |
| 2020 (5) | | | | | | |
| | Succulents/Grassland | 120 | 101 | 81 | 80.20 | 67.50 |
| | Bare Ground | 45 | 50 | 45 | 90.00 | 100.00 |
| | Herbaceous Shrub | 40 | 50 | 22 | 44.00 | 55.00 |
| | Woody Vegetation | 46 | 50 | 38 | 76.00 | 82.61 |
| | Totals: | 251 | 251 | 47 | | |
| Overall Classification Accuracy: 74.1% Kappa Coefficient: 0.632 | | | | | | |

***Table 26. Percent Landscape (PLAND) (%) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Brood Home Ranges (n=3) in the Southern High Plains of Texas***

| **Bird ID** | **Bare Ground** | **Cholla** | **Grassland** | **Herbaceous Shrub** | **Structures** | **Succulents/Grassland** | **Woody Veg** | **Yucca** |
|---|---|---|---|---|---|---|---|---|
| 7788 | 10.5325 | | | 5.9726 | 0.7812 | 80.2921 | 2.4217 | |
| B5781 | 3.965 | 30.2538 | 31.8886 | 3.1082 | | | 2.531 | 28.2534 |
| B7754 | 2.3973 | | | 10.8366 | | 85.0917 | 1.6744 | |

***Table 27. Class Area (CA) (ha) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Brood Home Ranges (n=3) in the Southern High Plains of Texas***

| **Bird ID** | **Bare Ground** | **Cholla** | **Grassland** | **Herbaceous Shrub** | **Structures** | **Succulents/Grassland** | **Woody Veg** | **Yucca** |
|---|---|---|---|---|---|---|---|---|
| 7788 | 13.9428 | | | 7.9065 | 1.0341 | 106.29 | 3.2058 | |
| B5781 | 0.9954 | 7.5951 | 8.0055 | 0.7803 | | | 0.6354 | 7.0929 |
| B7754 | 0.7074 | | | 3.1977 | | 25.1091 | 0.4941 | |

***Table 28. Largest Patch Index (LPI) (ha) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Brood Home Ranges (n=3) in the Southern High Plains of Texas***

| Bird ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 7788 | 5.6184 | | | 0.1333 | 0.0394 | 76.4141 | 0.2101 | |
| B5781 | 1.0145 | 4.198 | 11.5831 | 0.4625 | | | 0.1649 | 4.9616 |
| B7754 | 0.0976 | | | 0.3172 | | 85.0642 | 0.0488 | |

*Table 29. Edge Density (ED) (m) Metric from Fragstats Analysis of Classified Scaled Quail (Callipepla squamata) Brood Home Ranges (n=3) in the Southern High Plains of Texas*

| Bird ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 7788 | 4.0287 | | | 0.0196 | 0.0093 | 96.4171 | 0.0387 | |
| B5781 | 383.2365 | 2462.417 | 2146.459 | 332.927 | | | 284.2905 | 2194.976 |
| B7754 | 264.4341 | | | 1154.929 | | 1473.857 | 196.4193 | |

*Table 30. Percent Landscape (PLAND) (%) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Brood Home Ranges (n=50) in the Southern High Plains of Texas*

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 11.1161 | 9.8623 | 66.7471 | 1.481 | | | 2.1374 | 8.6561 |
| 2 | 5.7456 | 24.0766 | 58.4051 | 2.8004 | | | 0.7524 | 8.22 |
| 3 | 6.7184 | 25.0962 | 57.0782 | 4.3175 | | | 0.317 | 6.4726 |
| 4 | 6.1824 | 21.2109 | 62.6619 | 2.7159 | | | 0.3457 | 6.8832 |
| 5 | 10.3915 | 10.3494 | 68.0611 | 1.3672 | | | 1.7245 | 8.1063 |
| 6 | 14.1381 | 13.3816 | 60.9393 | 1.0485 | | | 1.7898 | 8.7027 |
| 7 | 7.4312 | 14.6729 | 66.6012 | 2.0454 | | | 1.1553 | 8.094 |
| 8 | 7.2375 | 12.2995 | 70.8241 | 1.5248 | | | 1.0614 | 7.0526 |
| 9 | 6.7213 | 24.9397 | 53.7784 | 2.2737 | | | 1.592 | 10.695 |
| 10 | 13.498 | 48.2072 | 15.5618 | 1.3864 | | | 1.9188 | 19.4278 |
| 11 | 15.1583 | 43.7636 | 20.2418 | 1.1641 | | | 1.6113 | 18.061 |
| 12 | 17.6326 | 24.4254 | 42.8941 | 0.9971 | | | 1.9404 | 12.1104 |
| 13 | 15.6582 | 42.4972 | 22.2012 | 0.9491 | | | 1.3794 | 17.3149 |
| 14 | 13.5766 | 40.0974 | 22.0629 | 2.02 | | | 3.3117 | 18.9314 |
| 15 | 18.7963 | 33.4438 | 32.6888 | 0.5822 | | | 1.1194 | 13.3695 |
| 16 | 12.7554 | 50.558 | 12.4803 | 1.9161 | | | 2.5175 | 19.7727 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 18.7052 | 44.7995 | 15.5521 | 3.8127 | | 4.9947 | 12.1359 |
| 18 | 16.6907 | 40.1714 | 25.3178 | 0.58 | | 1.0512 | 16.1888 |
| 19 | 6.7577 | 26.7421 | 43.7962 | 4.618 | | 1.5196 | 16.5665 |
| 20 | 5.8998 | 22.9093 | 47.6527 | 3.1852 | | 2.6699 | 17.6831 |
| 21 | 9.8439 | 24.9897 | 54.0366 | 2.5822 | | 0.8252 | 7.7225 |
| 22 | 9.5444 | 27.0399 | 52.3745 | 2.415 | | 0.3896 | 8.2366 |
| 23 | 6.2128 | 31.4589 | 46.6592 | 2.3579 | | 0.5895 | 12.7217 |
| 24 | 4.5915 | 34.3781 | 43.2762 | 2.8026 | | 0.4578 | 14.4939 |
| 25 | 9.2499 | 29.4628 | 46.7676 | 4.0109 | | 0.7478 | 9.761 |
| 26 | 5.1655 | | | 13.2928 | 79.4173 | 2.1244 | |
| 27 | 6.1766 | | | 4.4322 | 88.6299 | 0.7613 | |
| 28 | 4.3947 | | | 5.0787 | 87.2023 | 3.3243 | |
| 29 | 10.5988 | | | 8.7053 | 79.2315 | 1.4644 | |
| 30 | 4.3852 | | | 1.6083 | 91.0022 | 3.0044 | |
| 31 | 2.509 | | | 9.838 | 86.4301 | 1.2231 | |
| 32 | 4.7552 | | | 15.2092 | 79.5998 | 0.4359 | |
| 33 | 3.5085 | | | 7.9201 | 87.7658 | 0.8055 | |
| 34 | 5.173 | | | 14.0552 | 78.9893 | 1.7823 | |
| 35 | 2.1022 | | | 10.6487 | 86.0329 | 1.2162 | |
| 36 | 15.3489 | | | 2.9321 | 77.6121 | 4.1069 | |
| 37 | 9.2069 | | | 4.846 | 83.9047 | 2.0424 | |
| 38 | 29.5526 | | | 1.2082 | 61.6691 | 7.5701 | |
| 39 | 5.5254 | | | 6.889 | 86.2802 | 1.3054 | |
| 40 | 25.2238 | | | 1.1353 | 67.1366 | 6.5044 | |
| 41 | 11.095 | | | 7.458 | 81.1088 | 0.3382 | |
| 42 | 16.3771 | | | 11.1939 | 71.9138 | 0.5151 | |
| 43 | 12.6444 | | | 10.1694 | 76.1527 | 1.0334 | |
| 44 | 4.919 | | | 9.7122 | 83.3598 | 2.009 | |
| 45 | 4.1771 | | | 9.9452 | 84.085 | 1.7926 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 46 | 10.326 | | 3.7856 | | 85.4048 | 0.4838 |
| 47 | 15.0679 | | 2.1784 | | 82.1117 | 0.6419 |
| 48 | 17.1835 | | 9.3513 | 0.2307 | 73.0738 | 0.1606 |
| 49 | 9.9965 | | 1.7002 | | 87.7048 | 0.5986 |
| 50 | 9.6295 | | 1.3563 | | 88.4791 | 0.5351 |

***Table 31. Class Area (CA) (ha) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Brood Home Ranges (n=50) in the Southern High Plains of Texas***

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 3.5667 | 3.1644 | 21.4164 | 0.4752 | | | 0.6858 | 2.7774 |
| 2 | 1.2852 | 5.3856 | 13.0644 | 0.6264 | | | 0.1683 | 1.8387 |
| 3 | 1.6974 | 6.3405 | 14.4207 | 1.0908 | | | 0.0801 | 1.6353 |
| 4 | 2.3499 | 8.0622 | 23.8176 | 1.0323 | | | 0.1314 | 2.6163 |
| 5 | 3.7692 | 3.7539 | 24.687 | 0.4959 | | | 0.6255 | 2.9403 |
| 6 | 5.0121 | 4.7439 | 21.6036 | 0.3717 | | | 0.6345 | 3.0852 |
| 7 | 2.8251 | 5.5782 | 25.3197 | 0.7776 | | | 0.4392 | 3.0771 |
| 8 | 2.7126 | 4.6098 | 26.5446 | 0.5715 | | | 0.3978 | 2.6433 |
| 9 | 1.4553 | 5.4 | 11.6442 | 0.4923 | | | 0.3447 | 2.3157 |
| 10 | 3.8556 | 13.77 | 4.4451 | 0.396 | | | 0.5481 | 5.5494 |
| 11 | 5.4612 | 15.7671 | 7.2927 | 0.4194 | | | 0.5805 | 6.507 |
| 12 | 6.2073 | 8.5986 | 15.1002 | 0.351 | | | 0.6831 | 4.2633 |
| 13 | 5.895 | 15.9993 | 8.3583 | 0.3573 | | | 0.5193 | 6.5187 |
| 14 | 3.1878 | 9.4149 | 5.1804 | 0.4743 | | | 0.7776 | 4.4451 |
| 15 | 7.1478 | 12.7179 | 12.4308 | 0.2214 | | | 0.4257 | 5.0841 |
| 16 | 2.2527 | 8.9289 | 2.2041 | 0.3384 | | | 0.4446 | 3.492 |
| 17 | 4.4154 | 10.575 | 3.6711 | 0.9 | | | 1.179 | 2.8647 |
| 18 | 6.345 | 15.2712 | 9.6246 | 0.2205 | | | 0.3996 | 6.1542 |
| 19 | 2.5695 | 10.1682 | 16.6527 | 1.7559 | | | 0.5778 | 6.2991 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20 | 1.3086 | 5.0814 | 10.5696 | 0.7065 | | | 0.5922 | 3.9222 |
| 21 | 2.5767 | 6.5412 | 14.1444 | 0.6759 | | | 0.216 | 2.0214 |
| 22 | 2.2266 | 6.3081 | 12.2184 | 0.5634 | | | 0.0909 | 1.9215 |
| 23 | 2.0394 | 10.3266 | 15.3162 | 0.774 | | | 0.1935 | 4.176 |
| 24 | 0.8847 | 6.624 | 8.3385 | 0.54 | | | 0.0882 | 2.7927 |
| 25 | 3.5181 | 11.2059 | 17.7876 | 1.5255 | | | 0.2844 | 3.7125 |
| 26 | 1.8207 | | | 4.6854 | | 27.9927 | 0.7488 | |
| 27 | 2.9574 | | | 2.1222 | | 42.4368 | 0.3645 | |
| 28 | 1.116 | | | 1.2897 | | 22.1445 | 0.8442 | |
| 29 | 5.1786 | | | 4.2534 | | 38.7126 | 0.7155 | |
| 30 | 1.5435 | | | 0.5661 | | 32.031 | 1.0575 | |
| 31 | 1.2204 | | | 4.7853 | | 42.0408 | 0.5949 | |
| 32 | 1.728 | | | 5.5269 | | 28.926 | 0.1584 | |
| 33 | 0.9369 | | | 2.115 | | 23.4369 | 0.2151 | |
| 34 | 1.9017 | | | 5.1669 | | 29.0376 | 0.6552 | |
| 35 | 0.9738 | | | 4.9329 | | 39.8538 | 0.5634 | |
| 36 | 7.4673 | | | 1.4265 | | 37.7586 | 1.998 | |
| 37 | 3.3309 | | | 1.7532 | | 30.3552 | 0.7389 | |
| 38 | 11.1834 | | | 0.4572 | | 23.337 | 2.8647 | |
| 39 | 2.6514 | | | 3.3057 | | 41.4018 | 0.6264 | |
| 40 | 11.1582 | | | 0.5022 | | 29.6991 | 2.8773 | |
| 41 | 5.049 | | | 3.3939 | | 36.9099 | 0.1539 | |
| 42 | 7.3539 | | | 5.0265 | | 32.292 | 0.2313 | |
| 43 | 6.0786 | | | 4.8888 | | 36.6093 | 0.4968 | |
| 44 | 2.3931 | | | 4.725 | | 40.5549 | 0.9774 | |
| 45 | 2.0322 | | | 4.8384 | | 40.9077 | 0.8721 | |
| 46 | 4.8411 | | | 1.7748 | | 40.0401 | 0.2268 | |
| 47 | 6.0633 | | | 0.8766 | | 33.0417 | 0.2583 | |
| 48 | 8.3781 | | | 4.5594 | 0.1125 | 35.6283 | 0.0783 | |

| | | | | |
|---|---|---|---|---|
| 49 | 4.8843 | 0.8307 | 42.8526 | 0.2925 |
| 50 | 4.6647 | 0.657 | 42.8607 | 0.2592 |

***Table 32. Largest Patch Index (LPI) (ha) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Brood Home Ranges (n=50) in the Southern High Plains of Texas***

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 2.7853 | 0.6115 | 66.0599 | 0.0393 | | | 0.1515 | 0.2749 |
| 2 | 0.684 | 8.5419 | 53.605 | 0.1972 | | | 0.0403 | 0.5512 |
| 3 | 0.4524 | 7.4879 | 54.0895 | 0.0855 | | | 0.0321 | 0.1888 |
| 4 | 0.2202 | 6.9874 | 60.1875 | 0.0568 | | | 0.0071 | 0.0758 |
| 5 | 2.4639 | 0.5409 | 67.4557 | 0.0348 | | | 0.1315 | 0.2432 |
| 6 | 2.3839 | 2.2239 | 48.3777 | 0.0407 | | | 0.1422 | 0.3478 |
| 7 | 0.5895 | 0.9919 | 65.6069 | 0.0781 | | | 0.0616 | 0.1231 |
| 8 | 1.0013 | 1.0061 | 70.3054 | 0.012 | | | 0.0408 | 0.1249 |
| 9 | 0.7066 | 5.0545 | 49.576 | 0.2203 | | | 0.0914 | 0.9851 |
| 10 | 0.8633 | 43.9568 | 0.8224 | 0.063 | | | 0.0441 | 1.6951 |
| 11 | 0.6845 | 38.4802 | 5.126 | 0.05 | | | 0.02 | 1.344 |
| 12 | 1.7922 | 5.471 | 33.4092 | 0.0972 | | | 0.1482 | 0.4423 |
| 13 | 0.8726 | 35.9016 | 8.1542 | 0.0478 | | | 0.0143 | 1.2813 |
| 14 | 1.514 | 21.7103 | 7.8654 | 0.0767 | | | 0.5136 | 2.664 |
| 15 | 1.6307 | 16.2379 | 20.8056 | 0.0615 | | | 0.0142 | 0.471 |
| 16 | 1.2689 | 46.3283 | 0.9071 | 0.1019 | | | 0.0713 | 2.7417 |
| 17 | 5.0252 | 18.831 | 1.6814 | 0.0915 | | | 0.366 | 0.9646 |
| 18 | 1.2287 | 32.0865 | 6.5177 | 0.0473 | | | 0.0142 | 1.3755 |
| 19 | 1.6735 | 3.0321 | 24.1479 | 0.2769 | | | 0.045 | 0.5917 |
| 20 | 0.5802 | 2.2642 | 39.8742 | 0.1096 | | | 0.0771 | 0.4991 |
| 21 | 1.0143 | 2.4825 | 49.6115 | 0.086 | | | 0.0894 | 0.2751 |
| 22 | 1.4969 | 3.9929 | 49.7319 | 0.3086 | | | 0.0077 | 0.1273 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 23 | 0.913 | 12.2721 | 30.9681 | 0.0685 | | | 0.0247 | 0.3482 |
| 24 | 0.383 | 12.3733 | 28.9972 | 0.0701 | | | 0.0234 | 0.4204 |
| 25 | 1.6611 | 4.3871 | 37.9839 | 0.213 | | | 0.0355 | 0.5868 |
| 26 | 2.9875 | | | 0.7941 | | 35.9744 | 0.1329 | |
| 27 | 2.2048 | | | 0.2538 | | 42.3 | 0.0319 | |
| 28 | 3.1436 | | | 1.1022 | | 25.8506 | 0.1772 | |
| 29 | 2.9951 | | | 0.3702 | | 19.2249 | 0.0607 | |
| 30 | 1.5265 | | | 0.179 | | 13.8868 | 0.0972 | |
| 31 | 0.6032 | | | 0.2147 | | 81.5065 | 0.0389 | |
| 32 | 0.7727 | | | 1.003 | | 78.624 | 0.0149 | |
| 33 | 1.156 | | | 0.4045 | | 84.7932 | 0.0842 | |
| 34 | 2.906 | | | 0.7614 | | 38.8508 | 0.098 | |
| 35 | 0.1807 | | | 0.2292 | | 85.009 | 0.0505 | |
| 36 | 9.5142 | | | 0.2349 | | 76.0545 | 0.6104 | |
| 37 | 4.5127 | | | 0.2985 | | 83.5862 | 0.1393 | |
| 38 | 21.6757 | | | 0.0809 | | 45.0543 | 0.8966 | |
| 39 | 2.155 | | | 0.2345 | | 86.0907 | 0.0751 | |
| 40 | 16.0522 | | | 0.0692 | | 46.696 | 0.3459 | |
| 41 | 3.643 | | | 1.0165 | | 41.9655 | 0.0258 | |
| 42 | 5.9767 | | | 0.7516 | | 26.1419 | 0.0361 | |
| 43 | 3.044 | | | 0.3763 | | 19.5527 | 0.0413 | |
| 44 | 1.9147 | | | 0.4477 | | 44.9312 | 0.1146 | |
| 45 | 0.8047 | | | 0.4477 | | 55.4888 | 0.1072 | |
| 46 | 3.5187 | | | 0.6757 | | 41.8567 | 0.0096 | |
| 47 | 6.4011 | | | 0.1633 | | 26.309 | 0.0649 | |
| 48 | 6.1081 | | | 1.8533 | 0.0074 | 26.3615 | 0.0037 | |
| 49 | 4.2311 | | | 0.035 | | 30.0742 | 0.0534 | |
| 50 | 3.2439 | | | 0.0149 | | 24.7863 | 0.0539 | |

*Table 33. Edge Density (ED) (m) Metric from Fragstats Analysis of Classified Random Scaled Quail (Callipepla squamata) Brood Home Ranges (n=50) in the Southern High Plains of Texas*

| ID | Bare Ground | Cholla | Grassland | Herbaceous Shrub | Structures | Succulents/Grassland | Woody Veg | Yucca |
|---|---|---|---|---|---|---|---|---|
| 1 | 929.3802 | 977.0647 | 2412.181 | 178.2091 | | | 250.4839 | 917.2253 |
| 2 | 569.8613 | 1788.445 | 2430.461 | 326.5739 | | | 88.3828 | 854.0543 |
| 3 | 604.1607 | 1870.785 | 2406.55 | 503.111 | | | 38.1163 | 697.9671 |
| 4 | 615.8691 | 1702.776 | 2409.175 | 322.102 | | | 44.515 | 767.6462 |
| 5 | 875.3081 | 1014.59 | 2378.873 | 165.2524 | | | 201.5615 | 866.8718 |
| 6 | 1155.708 | 1122.958 | 2427.689 | 126.8512 | | | 207.1592 | 883.1345 |
| 7 | 609.834 | 1314.521 | 2317.496 | 245.4961 | | | 130.6787 | 855.3301 |
| 8 | 541.8948 | 1140.14 | 2158.054 | 194.5859 | | | 122.7068 | 772.1801 |
| 9 | 642.7522 | 1750.076 | 2253.166 | 266.0238 | | | 183.7227 | 988.4446 |
| 10 | 1264.1 | 2770.811 | 1403.89 | 153.4438 | | | 228.9579 | 1672.233 |
| 11 | 1381.263 | 2609.811 | 1590.351 | 126.6518 | | | 198.0965 | 1623.492 |
| 12 | 1512.378 | 1778.261 | 2364.396 | 113.2558 | | | 225.915 | 1176.275 |
| 13 | 1414.501 | 2545.879 | 1675.87 | 103.3524 | | | 172.7586 | 1574.271 |
| 14 | 1167.159 | 2423.371 | 1559.406 | 225.3823 | | | 344.5897 | 1530.913 |
| 15 | 1650.928 | 2242.523 | 2148.565 | 66.583 | | | 140.1084 | 1304.207 |
| 16 | 1191.119 | 2750.684 | 1227.811 | 207.5795 | | | 297.4401 | 1689.174 |
| 17 | 1423.288 | 2512.709 | 1404.225 | 430.0747 | | | 530.3492 | 1119.16 |
| 18 | 1511.478 | 2498.639 | 1873.466 | 69.9985 | | | 133.1313 | 1490.645 |
| 19 | 578.7256 | 2233.084 | 2838.083 | 475.4466 | | | 178.5489 | 1601.496 |
| 20 | 532.4948 | 2129.032 | 2881.991 | 367.485 | | | 315.6827 | 1769.527 |
| 21 | 812.9327 | 2048.32 | 2728.304 | 282.7442 | | | 91.3446 | 844.4506 |
| 22 | 792.0219 | 2239.497 | 2916.811 | 254.4912 | | | 50.924 | 896.4418 |
| 23 | 526.234 | 2309.471 | 2684.452 | 272.5304 | | | 70.8286 | 1298.678 |
| 24 | 428.0131 | 2448.503 | 2738.101 | 326.0311 | | | 57.2968 | 1486.135 |
| 25 | 766.4458 | 2349.266 | 2891.623 | 399.1166 | | | 90.5506 | 1028.317 |
| 26 | 363.3439 | | | 1247.745 | | 3740.595 | 241.2079 | |

| | | | | | |
|---|---|---|---|---|---|
| 27 | 494.4142 | 456.3824 | | 5850.767 | 89.7853 |
| 28 | 273.0129 | 472.6633 | | 5823.292 | 380.0444 |
| 29 | 723.7808 | 873.105 | | 5722.768 | 170.7528 |
| 30 | 373.4008 | 175.9186 | | 6581.52 | 329.336 |
| 31 | 228.2623 | 1067.856 | | 1331.705 | 143.1496 |
| 32 | 394.6141 | 1414.254 | | 1766.435 | 53.6609 |
| 33 | 265.3545 | 850.887 | | 1168.369 | 94.8176 |
| 34 | 371.2318 | 1330.036 | | 3301.751 | 203.5287 |
| 35 | 215.3316 | 1128.467 | | 1387.254 | 140.9856 |
| 36 | 863.1789 | 297.0993 | | 1329.732 | 385.8961 |
| 37 | 668.4412 | 506.4929 | | 1291.524 | 223.56 |
| 38 | 1241.23 | 132.0744 | | 1578.392 | 660.1342 |
| 39 | 425.3803 | 739.4139 | | 1235.003 | 148.358 |
| 40 | 1120.877 | 125.3255 | | 1433.241 | 582.1398 |
| 41 | 732.5514 | 653.574 | | 5030.82 | 42.0598 |
| 42 | 979.6298 | 1018.981 | | 4995.023 | 61.3313 |
| 43 | 827.4829 | 997.7846 | | 5431.059 | 121.8759 |
| 44 | 376.7698 | 971.3384 | | 4755.007 | 226.8635 |
| 45 | 380.5313 | 1029.488 | | 4264.528 | 202.0744 |
| 46 | 711.2416 | 369.7305 | | 5575.584 | 61.9417 |
| 47 | 1038.745 | 239.9857 | | 5838.832 | 74.702 |
| 48 | 1075.916 | 844.501 | 29.7806 | 5000.8 | 20.6126 |
| 49 | 762.831 | 210.8469 | | 5801.605 | 70.9168 |
| 50 | 763.2902 | 171.361 | | 5790.478 | 62.5495 |

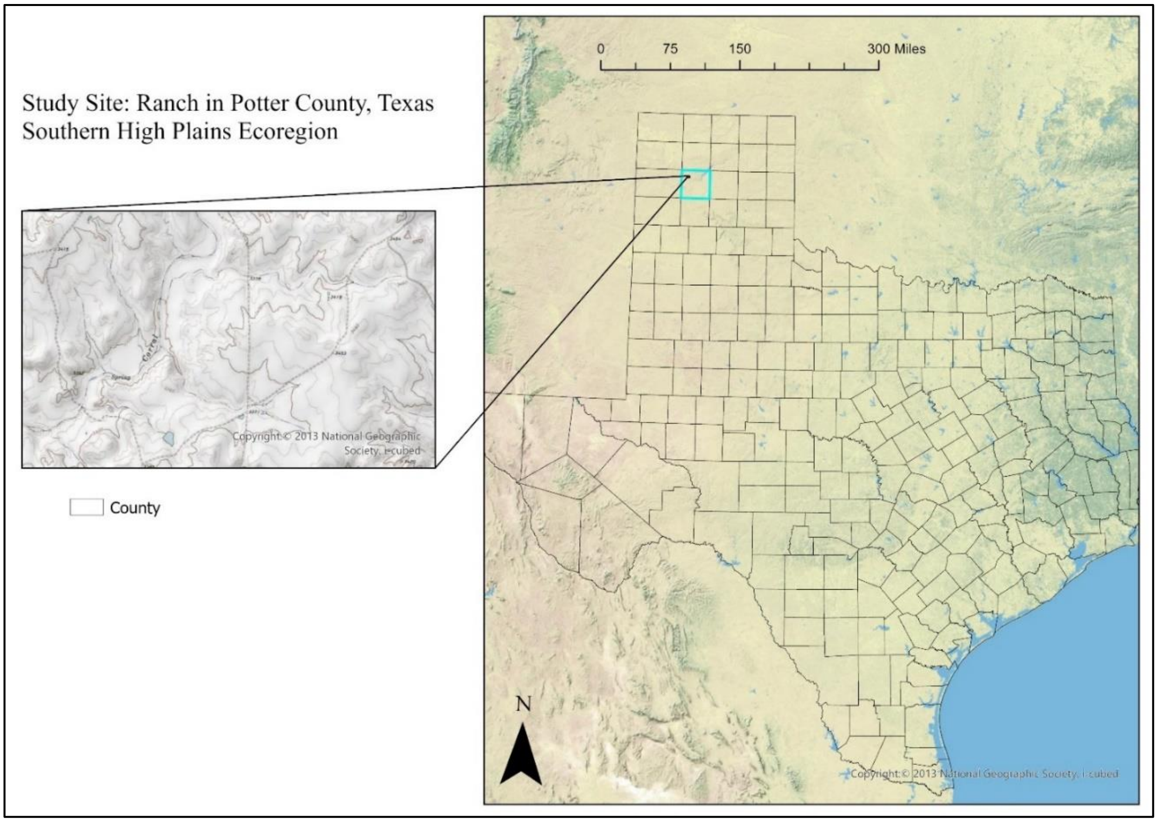


***Figure 15. Map of Study Site in Potter County, Texas, in the Southern High Plains Ecoregion***

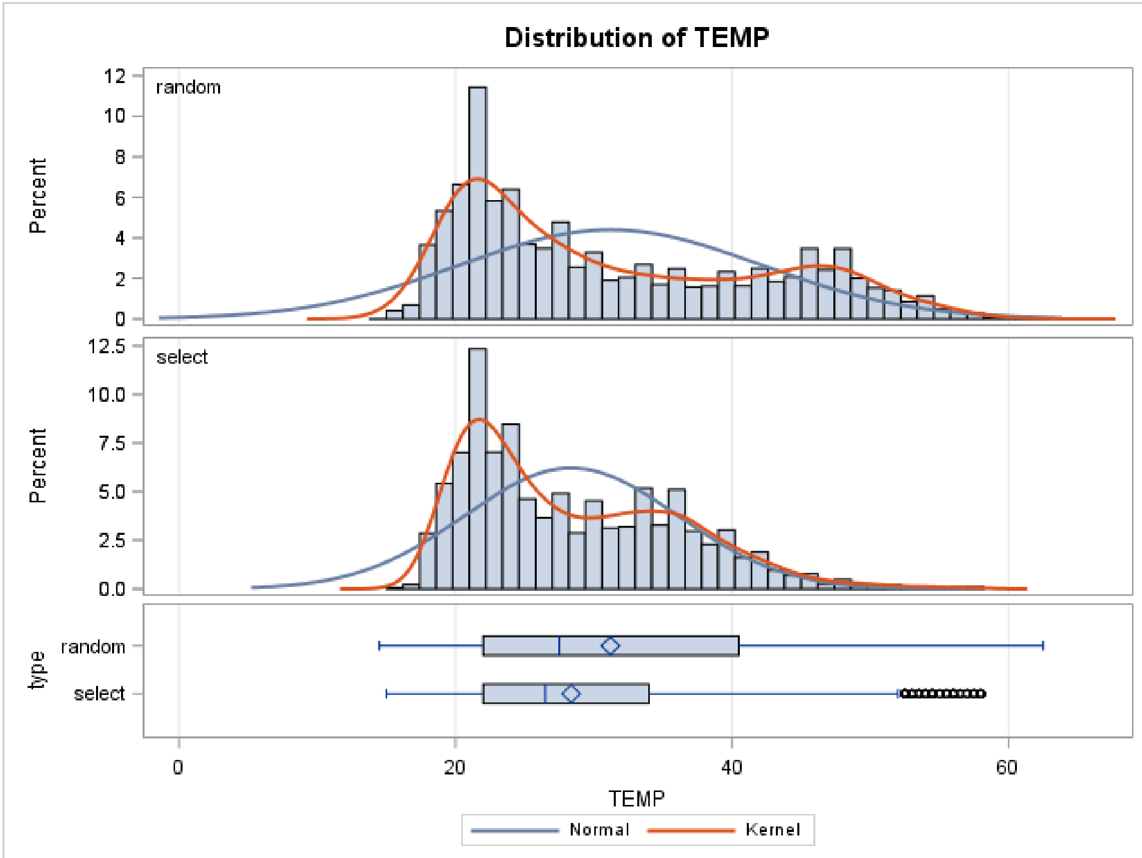


***Figure 16. Histogram of Proportion of Temperature Recordings from Scaled Quail (Callipepla squamata) Brood Sites and Paired Random Sites (n=24) (April 1 – August 15) from 2020 in the Southern High Plains of Texas***

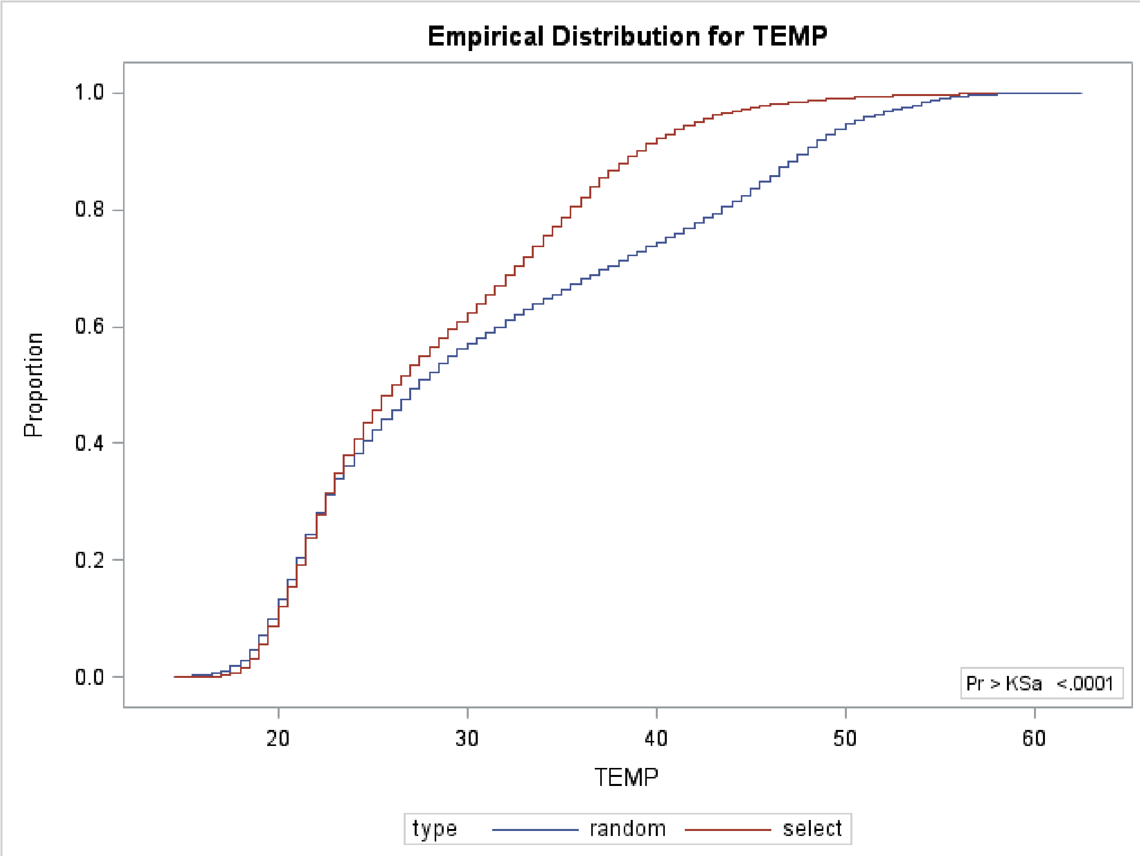


***Figure 17. Empirical Distribution Functions of Temperature Recordings from 2020 (April 1 – August 15) Between (n=24) Brood Sites (red) and Paired Random Sites (blue) Among All Scaled Quail (Callipepla squamata) Brood Checks Combined in the Southern High Plains of Texas, 92% of temperature recordings at brood sites versus 74% at random sites occurred to the left of the MD (40° C)***

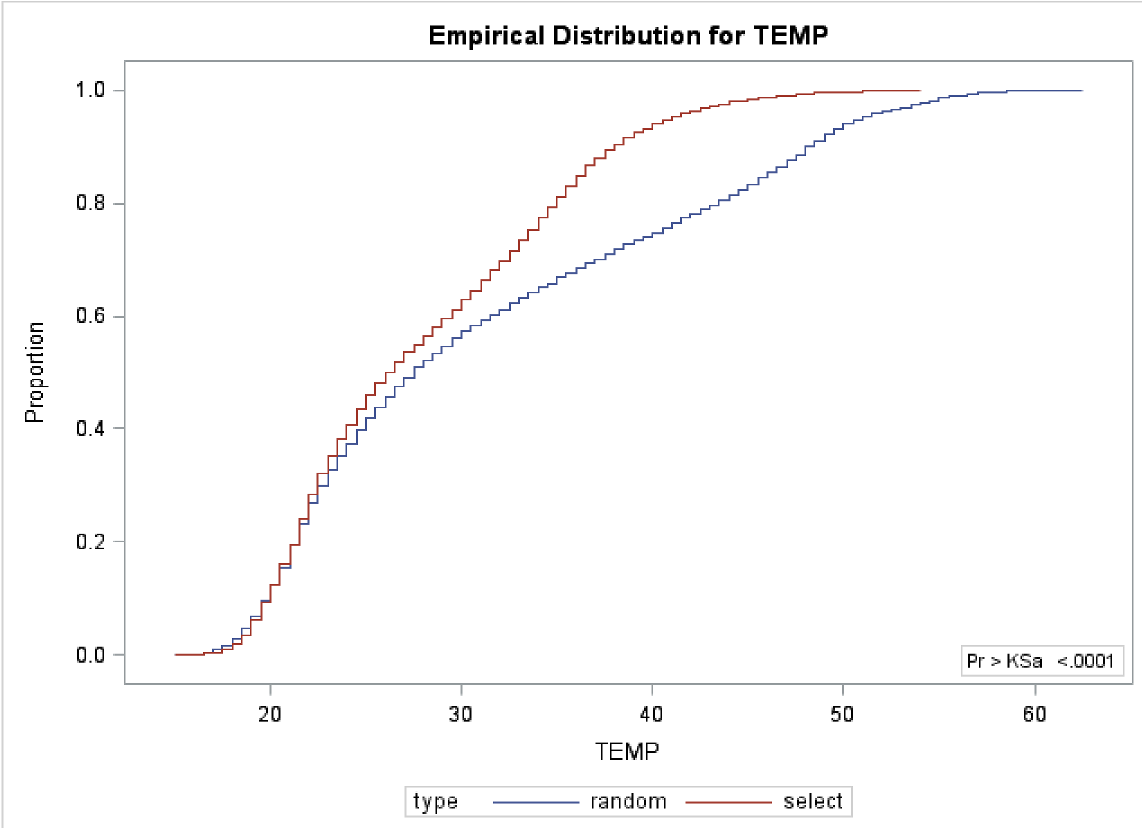


***Figure 18. Empirical Distribution Function of Temperature Recordings from 2020 (April 1 – August 15) Scaled Quail (Callipepla squamata) Brood Sites (red) and Paired Random Sites (blue) at First Brood Check (n=12) in the Southern High Plains of Texas, 94% of temperature recordings at brood sites versus 75% at random sites occurred to the left of the MD (40° C)***

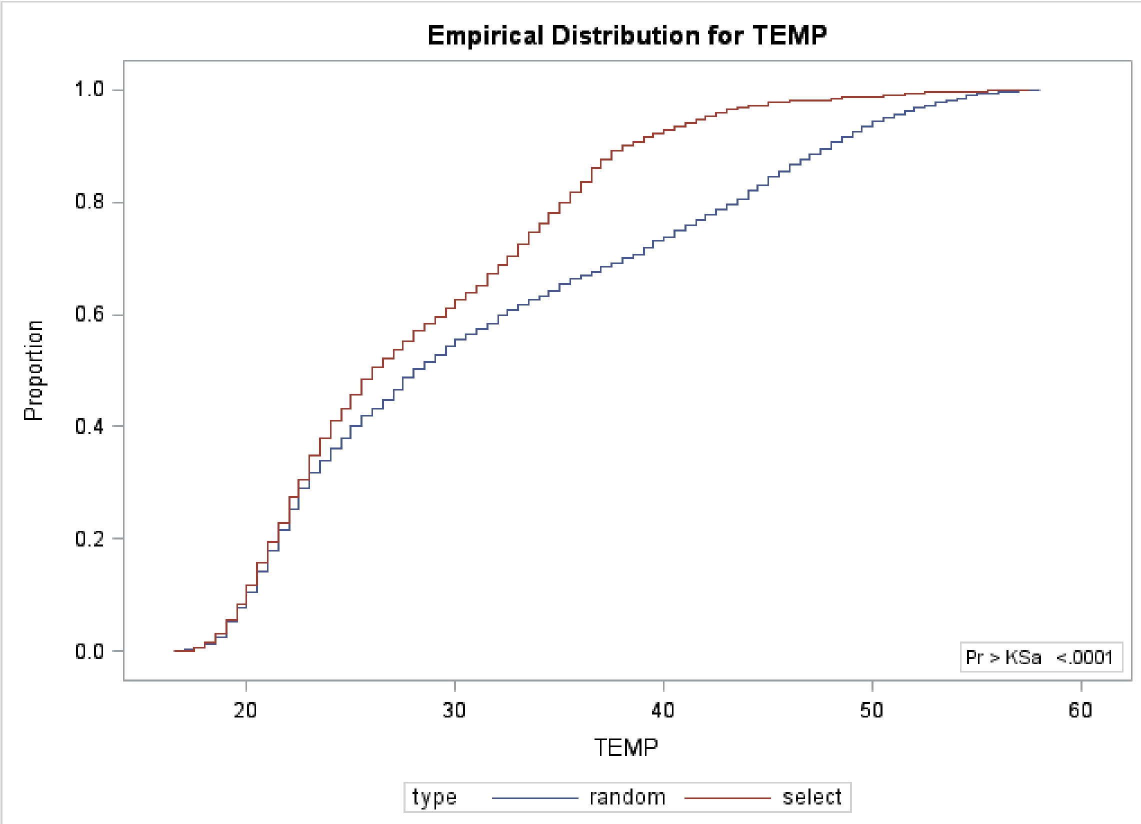


***Figure 19. Empirical Distribution Function of Temperature Recordings from 2020 (April 1 – August 15) Scaled Quail (Callipepla squamata) Brood Sites (red) and Paired Random Sites (blue) at Second Brood Check (n=5) in the Southern High Plains of Texas, 90% of temperature recordings at brood sites versus 69% at random sites occurred to the left of the MD (38° C)***

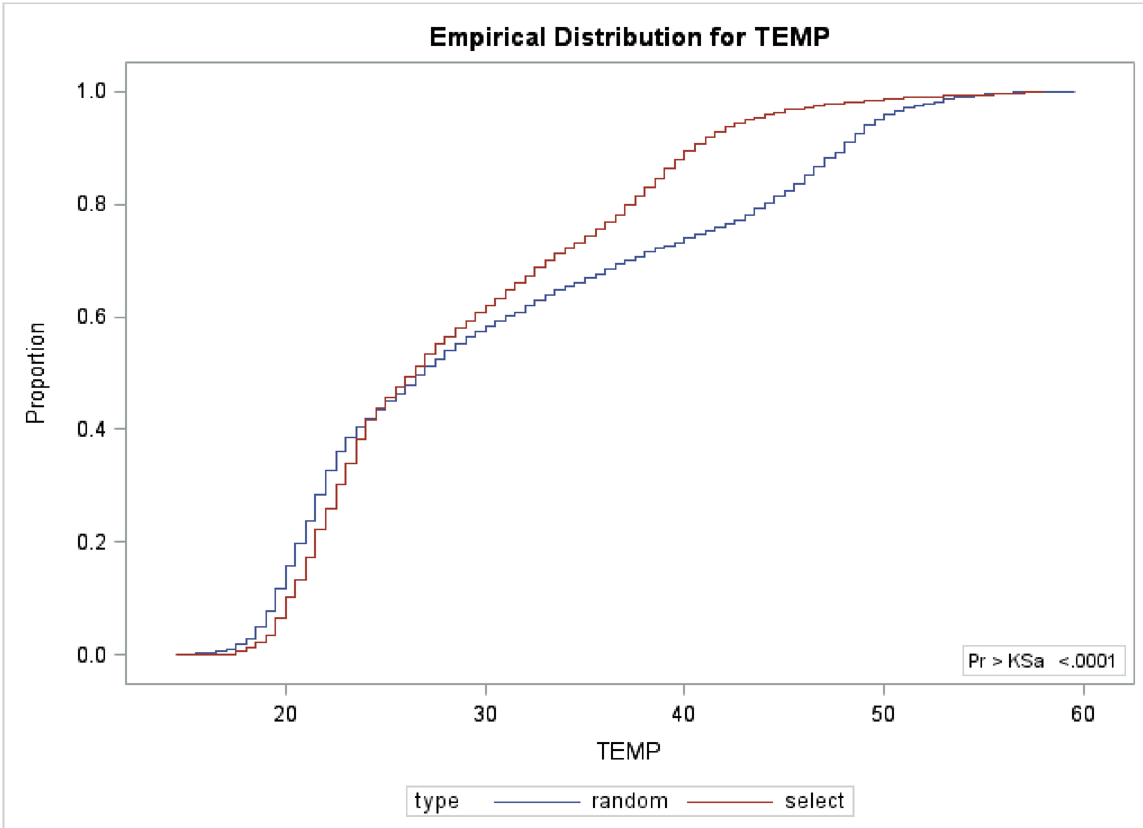


*Figure 20. Empirical Distribution Function of Temperature Recordings from 2020 (April 1 – August 15) Scaled Quail (Callipepla squamata) Brood Sites (red) and Paired Random Sites (blue) at Third Brood Check (n=4) in the Southern High Plains of Texas, 94% of temperature recordings at brood sites versus 77% at random sites occurred to the left of the MD (42.5° C)*

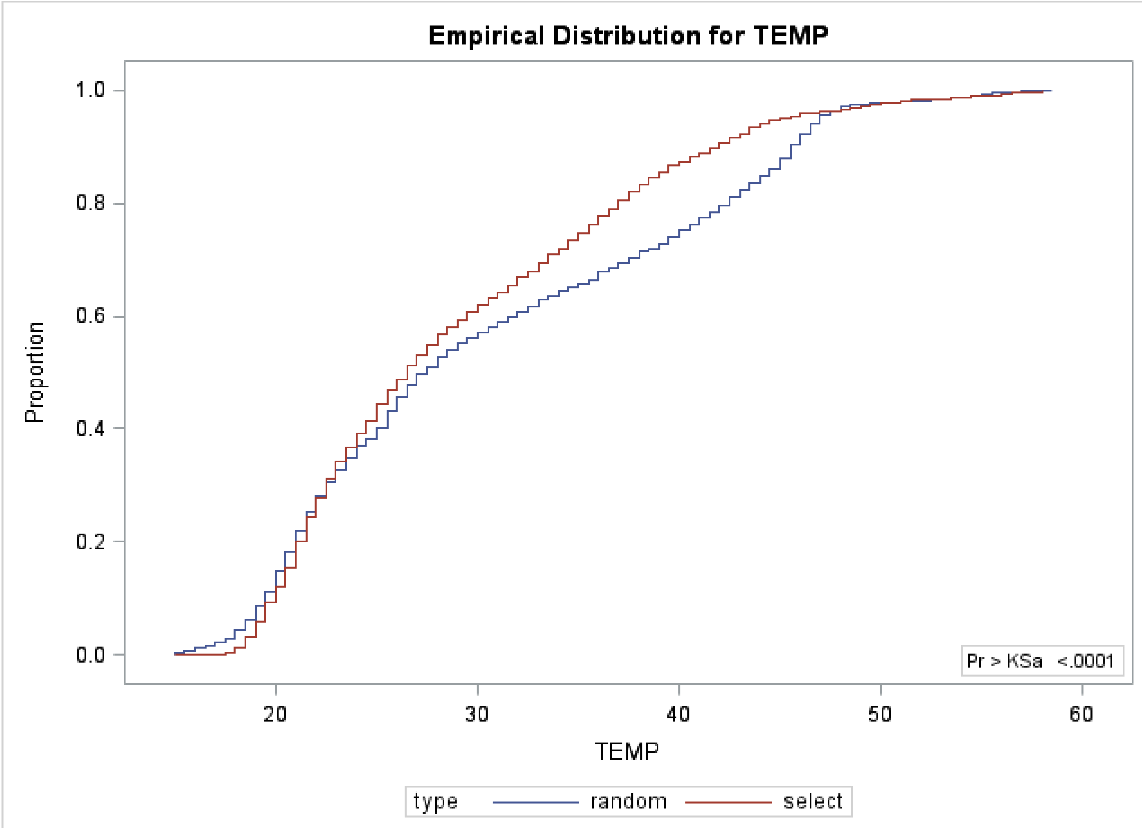


***Figure 21. Empirical Distribution Function of Temperature Recordings from 2020 (April 1 – August 15) Scaled Quail (Callipepla squamata) Brood Sites (red) and Paired Random Sites (blue) at Fourth Brood Check (n=2) in the Southern High Plains of Texas, 86% of temperature recordings at brood sites versus 73% at random sites occurred to the left of the MD (39° C)***

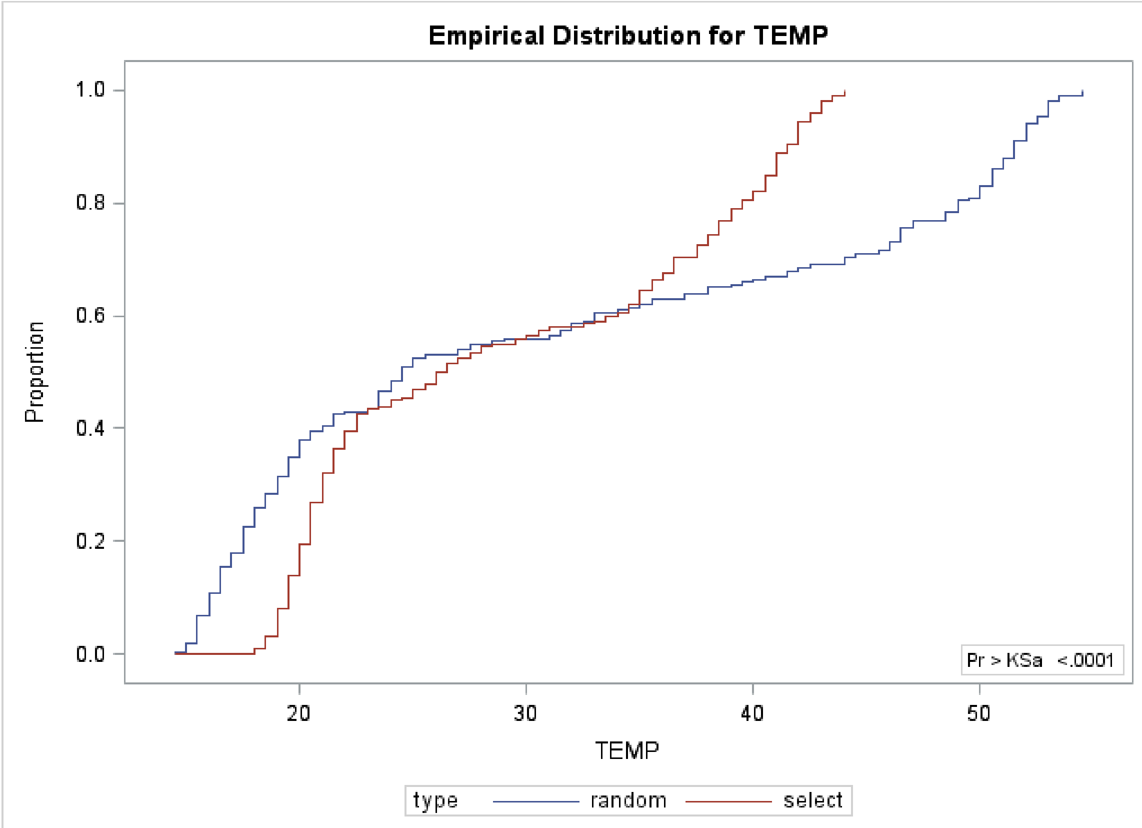


***Figure 22. Empirical Distribution Function of Temperature Recordings from 2020 (April 1 – August 15) Scaled Quail (Callipepla squamata) Brood Sites (red) and Paired Random Sites (blue) at Fifth Brood Check (n=1) in the Southern High Plains of Texas, 99% of temperature recordings at brood sites versus 69% at random sites occurred to the left of the MD (43.5° C)***

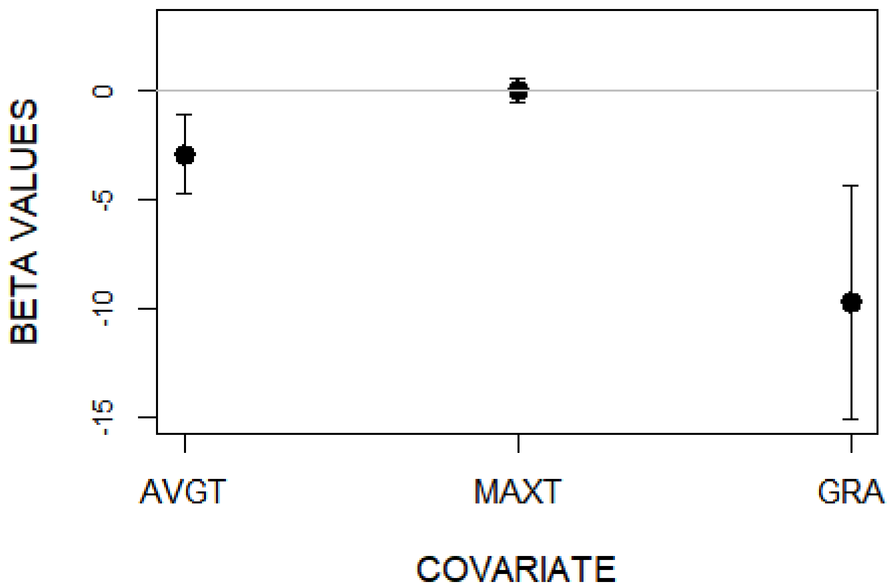


***Figure 23. Plot Illustrating Relationship Among Variables in Top Logistic Regression Model from Scaled Quail (Callipepla squamata) Brood Site Selection in the Southern High Plains 2020 (April 1 – August 15)***

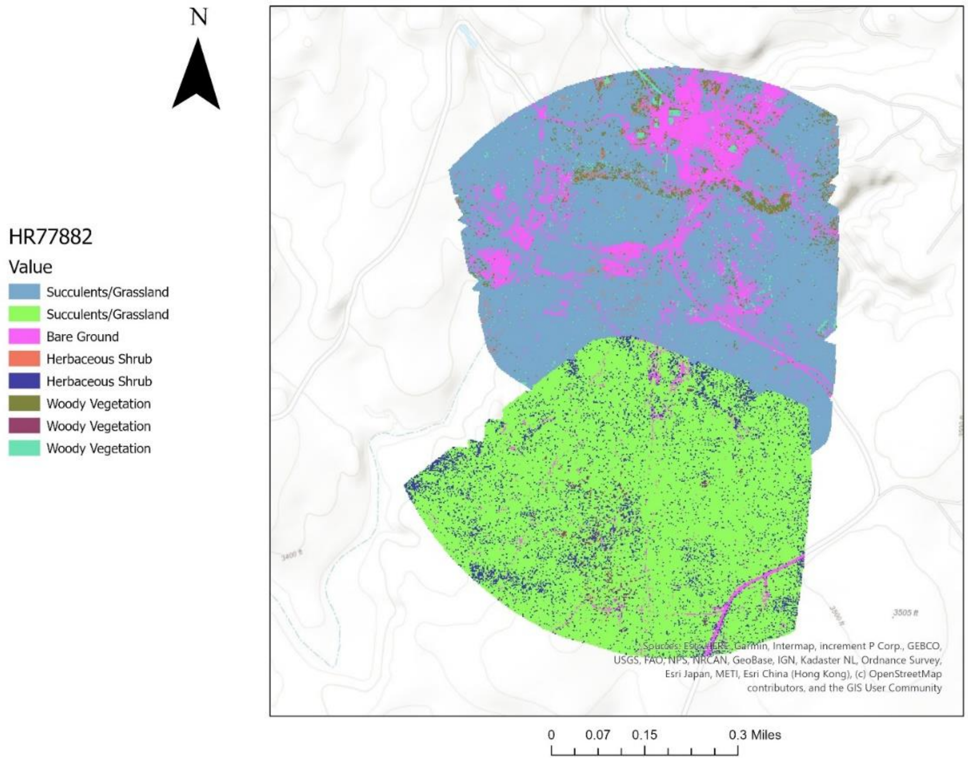


***Figure 24. Maximum Likelihood Classified Home Range of GPS-tagged Scaled Quail (Callipepla squamata) Hen with Brood in the Southern High Plains Ecoregion of Texas (after resampling)***

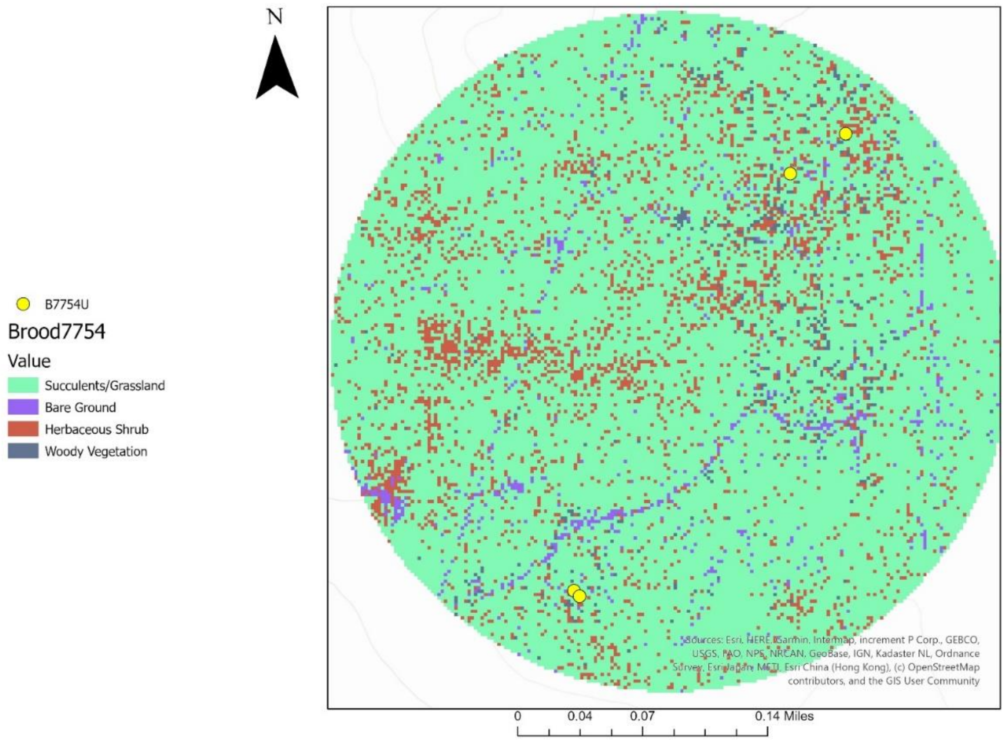


***Figure 25. Maximum Likelihood Classified Home Range of VHF-tagged Scaled Quail (Callipepla squamata) Chick in the Southern High Plains Ecoregion of Texas (after resampling)***

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