Conservation Reserve Program

CP33 - Habitat Buffers for Upland Birds

Bird Monitoring and Evaluation Plan

2006 - 2011 Final Report

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Wes Burger
Professor of Wildlife Ecology
Department of Wildlife, Fisheries and Aquaculture, Mississippi State University
wburger@cfr.msstate.edu, 662.325.7552

Kristine O. Evans
Research Associate II
Department of Wildlife, Fisheries and Aquaculture, Mississippi State University

Mark D. Smith
Postdoctoral Associate
Department of Wildlife, Fisheries and Aquaculture, Mississippi State University

Sam Riffell
Assistant Professor of Wildlife Ecology and Management
Department of Wildlife, Fisheries and Aquaculture, Mississippi State University
sriffell@cfr.msstate.edu, 662.325.0392

MISSISSIPPI STATE UNIVERSITY

Forest and Wildlife Research Center

Executive Summary

The United States Department of Agriculture (USDA) offers a suite of Farm Bill conservation programs and practices that provide incentives to enhance environmental quality on privately-owned agricultural lands. In 2004, the USDA Farm Service Agency (FSA) initiated conservation practice Habitat Buffers for Upland Birds (CP33) under the continuous sign-up Conservation Reserve Program (CRP) to target recovery of northern bobwhite (*Colinus virgianianus*) and other upland bird species in row-crop agricultural landscapes. This was the first CRP practice designed specifically to help meet recovery objectives of a large-scale wildlife conservation initiative and the first to require a wildlife monitoring component as part of its practice directive. The FSA initially allocated 250,000 CP33 acres to 35 states (increased to 350,000 acres in 2010) to be actively managed over a period of 10 years and charged the Southeast Quail Study Group (SEQSG, now National Bobwhite Technical Committee) with development of a coordinated CP33 monitoring protocol to generate measures of population response for northern bobwhite (*Colinus virginianus*) and other priority bird species at multiple spatial scales.

In 2006, we developed and implemented a coordinated CP33 monitoring effort across 14 states containing 80% of enrolled CP33 acreage within the core bobwhite range. We conducted breeding season and fall point-transect monitoring on at least 40 paired CP33 buffered and non-buffered fields in each state from 2006-2011. Monitoring from 2009-2011 constituted a Phase II component to evaluate bird response following when mid-contract management of buffers was scheduled to be initiated. We estimated densities of breeding season bobwhite and other priority bird species, and fall bobwhite coveys annually on CP33 buffered and non-buffered fields using a 3-tiered approach (across bobwhite range (overall), within each Bird Conservation Region (BCR), and within each state). We also conducted vegetation surveys in most participating states during 2007-2011 growing seasons to evaluate vegetation establishment, vegetation structure, buffer width, non-compliant disturbance, and mid-contract management in CP33 buffers.

Bobwhite and priority upland bird densities varied across states/regions, and by species, but generally followed the same trends within regions across years. We observed breeding season bobwhite densities 85-109% greater on CP33 buffered fields than non-buffered fields. We observed the greatest breeding season densities, but negligible influence of CP33 buffers in the Central Mixed-grass Prairie region (BCR 19). We observed the greatest effect of CP33 buffers in the Eastern Tallgrass Prairie (BCR 22) and Mississippi Alluvial Valley (BCR 26) regions. We observed 50-110% greater fall bobwhite covey densities on CP33 buffered fields compared to non-buffered fields across all states (2006-2008), though covey response varied by region and year. Covey densities were over 3 times greater on CP33 buffered fields than non-buffered fields in the Southeastern Coastal Plain (BCR 27) region and up to 2 times greater on CP33 buffered fields in the Central Hardwoods (BCR 24) and Mississippi Alluvial Valley (BCR 26) regions.

We observed 85-119% greater dickcissel (S*piza americana*) and 58-106% greater field sparrow (*Spizella pusilla*) densities on CP33 buffered fields compared to non-buffered fields across all states (2006-2011). Indigo buntings (*Passerina cyanea*) exhibited 25-72% greater density on CP33 buffered fields than non-buffered fields, but the magnitude of effect declined from 2006-2011. Grasshopper sparrow (*Ammodramus savannarum*) densities varied widely but only exhibited substantial positive response to CP33 buffers in 2009-2010. Eastern kingbird (*Tyrranus tyrannus*) densities were 11-17% greater on non-buffered fields than CP33 buffered fields across all states from 2006-2011. Eastern meadowlark (*Sturnella magna*) exhibited no response to buffers, with greater densities on non-buffered fields than CP33 buffered fields in 4 out of 6 years. Several other species (e.g., Painted bunting (*Passerina ciris*), vesper sparrow (*Pooecetes gramineus*) with limited ranges also exhibited variability in response to CP33 buffers.

Evaluation of vegetation composition and mid-contract management activities suggests an equitable distribution of cover types (<30% cover per vegetation category) within upland habitat buffers. Succession in buffers increased percent cover of litter and decreased percent bare ground across years. Landowner inquiries and in-field assessments suggest mid-contract management activities designed to set back succession and improve habitat quality for bobwhite were implemented on <50% of surveyed buffers from 2008-2011. Buffers that were managed utilized disking as a primary tool over alternative methods (e.g., fire, herbicide).

The CP33 monitoring program affords a rare opportunity to evaluate populations of grassland avifauna at a large geographic scale and demonstrates that measurable and substantive conservation benefits can be achieved through targeted and strategically implemented conservation practices for wildlife. The observed response validates an underlying assumption of the National Bobwhite Conservation Initiative (NBCI), that a relatively small (5-15%) change in primary land use in agricultural landscapes can disproportionately influence population response in some regions. Presuming greater densities on buffered fields represent net population increases rather than redistribution of existing populations from the surrounding landscape, CP33 may have the capacity to affect large-scale population changes in some declining bird species. However variable response to CP33 by species and across regions highlights the need for an understanding of ecological processes underlying observed differences in density.

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Introduction

Historical conversion of native grasslands to agricultural production, exacerbated today by factors such as clean-farming, urbanization, reforestation, and fire-exclusion have contributed to precipitous declines in populations of northern bobwhite and other grassland-obligate and successional-shrub bird species in North America. Results from the North American Breeding Bird Survey (BBS) suggest 43% of grassland species and 36% of successional-scrub species exhibited significant population declines since 1966 (Sauer et al. 2011). Among these, some of the most severe declines are observed in populations of northern bobwhite (*Colinus virginianus*) (3.8%), eastern meadowlark (*Sturnella magna*) (3.1%), grasshopper sparrow (*Ammodramus savannarum*) (2.7%), and field sparrow (*Spizella pusilla*) (2.3%) (Figure 1). Habitat loss in these anthropogenically altered landscapes has resulted in the dependence of many early-successional species on suboptimal habitat for various parts of their life cycle.

The National Bobwhite Conservation Initiative (NBCI; Dimmick et al. 2002, NBTC 2011) was developed to address the precipitous decline of bobwhite populations and outlines a strategy for the species' regional and range-wide recovery.

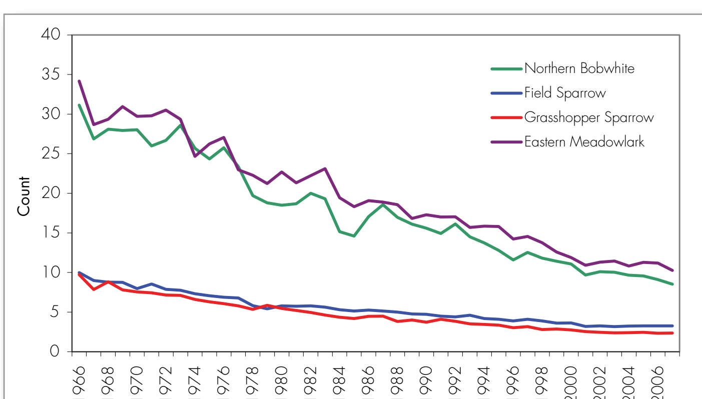


Figure 1. Population trends for northern bobwhite, grasshopper sparrow, eastern meadowlark, and field sparrow (1966-2008) according to the North American Breeding Bird Survey (Sauer et al. 2008).

The NBCI states nearly 20% of the 195 million range-wide acres suggested by biologists to have high-medium potential for bobwhite restoration hold opportunities for field and field margin management (NBTC 2011). Field margin management via conservation buffers provides a programmatic tool for creation of permanent habitat in row-crop agricultural landscapes where removal of whole fields from crop production is not economically feasible. Economic incentives that encourage establishment of diverse native herbaceous buffers around cropped fields can provide habitat for bobwhite and other early-successional songbirds with minimal or positive economic impact on producers (Barbour et al. 2007). However, the economic feasibility of buffer adoption varies in relation to yield, production costs, and commodity prices (Barbour et al. 2007, McConnell and Burger 2011). In 2004, the USDA-Farm Service Agency (FSA) implemented the Habitat Buffers for Upland Birds (CP33) practice as part of the continuous sign-up Conservation Reserve Program (CRP). In a pilot program, the FSA allocated 250,000 CP33 acres to 35 states to be actively managed over a period of 10 years (USDA 2004). Over 245,000 ac have been enrolled in 25 states, with the majority of acreage in Illinois, Kansas, and Missouri (USDA 2012; Figure 2).

CP33 requires establishment of 30-120 ft native herbaceous buffers along row-crop field margins. Cropland eligible for CP33 enrollment must meet all standard CRP cropping history and eligibility criteria, as well as hold potential for establishment of bobwhite populations (USDA 2004). CP33 buffers are enrolled in 10-year contracts and may be planted to native warm-season grass, forb, and legume mixes or established via natural regeneration following site preparation. A limited tree/shrub component (<10%) is also allowed. CP33 requires annual disturbance via light disking, burning, or herbicide application from contract years 4-10 on 1/3 of buffer acreage to maintain appropriate seral stage to meet bobwhite life history requirements. Incentives under the CP33 practice include a $100/ac Signup Incentive Payment (SIP), 40% Practice Incentive Payment (PIP), annual soil rental rate payment, 50% cost-share, and a Maintenance Incentive Payment (≤$5/ac), and 50% cost-share for mid-contract management.

When CP33 was initiated FSA mandated that states containing acreage monitor for bobwhite and priority upland birds to evaluate population response to CP33 buffers (USDA 2004). Members of the Southeast Quail Study Group (now the National Bobwhite Technical Committee) saw the unprecedented opportunity to evaluate programmatic effects of a CRP practice across the bobwhite range and advocated for development of a coordinated monitoring plan across state boundaries to estimate regional and range-wide population response to CP33. From this the National CP33 Monitoring Program was developed and implemented using the “CP33-Habitat Buffers for Upland Birds Monitoring Protocol” in 2006 (Burger et al. 2006). From 2006-2011 state fish and wildlife agencies, non-governmental organizations and universities in 14 states collaborated with Mississippi State University to monitor differences in bobwhite and upland songbird densities and buffer vegetation characteristics on nearly 600 CP33 buffered fields paired with non-buffered control fields. States participating in coordinated monitoring represent 80% of enrolled CP33 acreage. Monitoring was broken into 2 phases, with the initial phase (2006-2008) evaluating bird response in the 3 years following CP33 practice establishment and Phase II (2009-2011; contract years 4-6) evaluating bird response after mid-contract management activities were scheduled to commence.

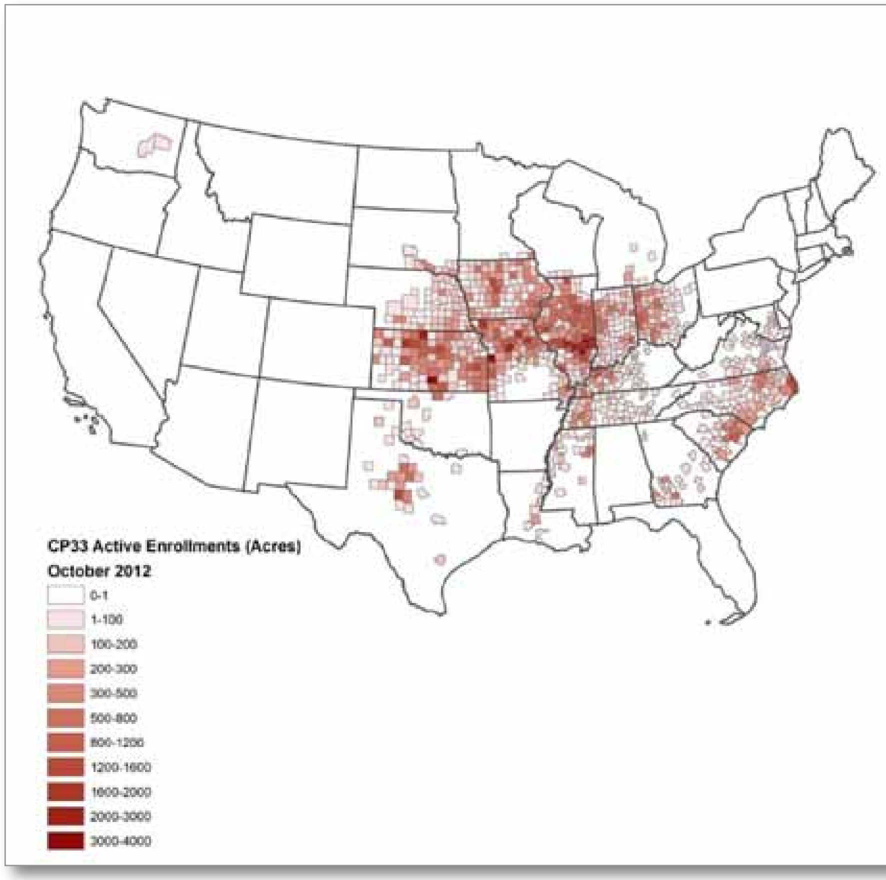


Figure 2. National distribution of CP33 active enrollment acreage by county as of July 2010.

Methods

Survey Methods

We coordinated surveys on spatially paired CP33 buffered vs. non-buffered row-crop fields in each state following the CP33 monitoring protocol (Burger et al. 2006) from 2006-2011 (Table 1). No list of unique CP33 buffered fields was available; therefore we randomly selected a sample of 40-50 CP33 contracts within each survey state. CP33 buffered fields were then selected from within the sample of contracts under a multi-stage sampling design. Once CP33 fields were selected, non-buffered "control" fields were then located with criteria that they be similarly cropped and located 1-3 km from randomly selected CP33 buffered fields in each state. Survey points were located in 10 Bird Conservation Regions (i.e., regions exhibiting similar habitat, land management, and bird communities (NABCI 2000)), with the majority of points located in the Eastern Tallgrass Prairie (BCR 22), Southeastern Coastal Plain (BCR 27), Central Hardwoods (BCR 24), and Central Mixed-grass Prairie (BCR 19) regions (Figure 3).

Up to 4 repeated surveys were conducted by state coordinators at 1 point in each CP33 buffered and non-buffered field during breeding season surveys and generally 1 survey was conducted at each point during autumn surveys. Bobwhite and a select group of priority upland bird species were targeted for monitoring during breeding season surveys, whereas bobwhite coveys were monitored during autumn surveys. Breeding season priority upland species were selected by Southeast Partners in Flight, based on specific conservation concerns in each Bird Conservation Region (Table 2).

Breeding season surveys were conducted May-July (2006-2011) between sunrise and three hours following sunrise during a 10-min count period (divided into 0-3, 4-5, and 6-10 min intervals). Uniquely identifiable singing or observed males were recorded once at their initial observed/perceived location and time interval into one of 6 pre-determined distance intervals (0-25, 26-50, 51-100, 100-250, 250-500, and >501 m). Paired buffered and non-buffered survey points were surveyed simultaneously by separate observers to ensure similar weather conditions, and observers alternated between visits within a single season if possible. Surveys were not conducted during episodes of high wind (> 6.5 km/hr or sustained 4 or greater on Beaufort scale), >75% cloud cover, or precipitation. Autumn surveys of calling bobwhite coveys were conducted September-November (2006-2008) at the same established survey points on paired buffered and non-buffered fields. Covey call surveys were conducted from 45 min before sunrise to 5 min before sunrise or until covey calls had ceased. Estimated covey locations and time of calling were recorded on datasheets featuring known-scale aerial photos of the survey location. Distance was later measured from georeferenced NAIP imagery in ARCGIS to generate an exact radial distance from the point to the estimated location of the calling covey (Figure 4). To derive measures of density that incorporated variable calling rates, number of adjacent calling coveys and weather characteristics (6-hr change in barometric pressure (1 am – 7 am; in/Hg), percent cloud cover, and wind speed (km/hr)) were recorded during each covey survey (Wellendorf et al. 2004).

We also coordinated state-level vegetation sampling to evaluate general vegetation composition and buffer characteristics during

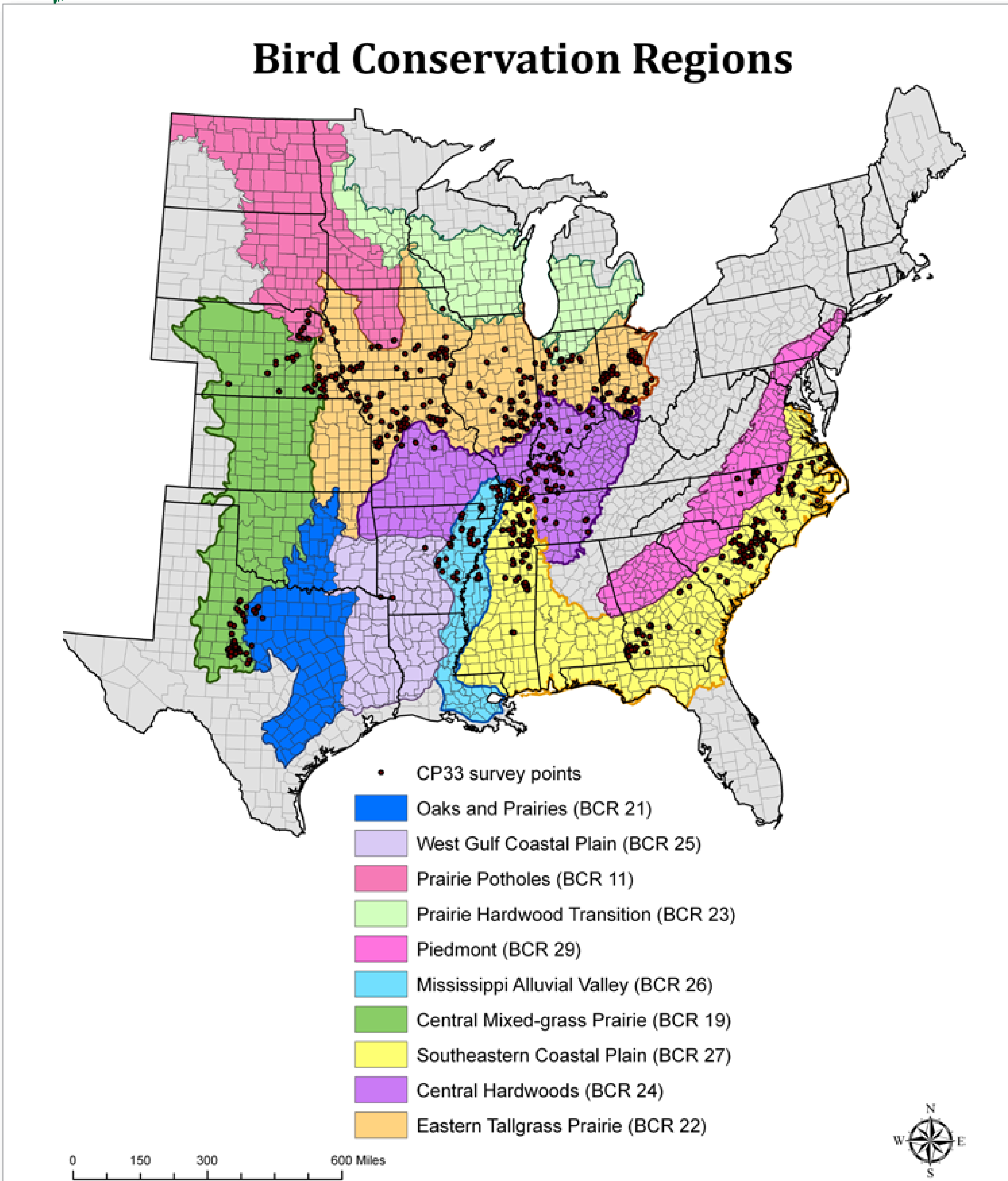
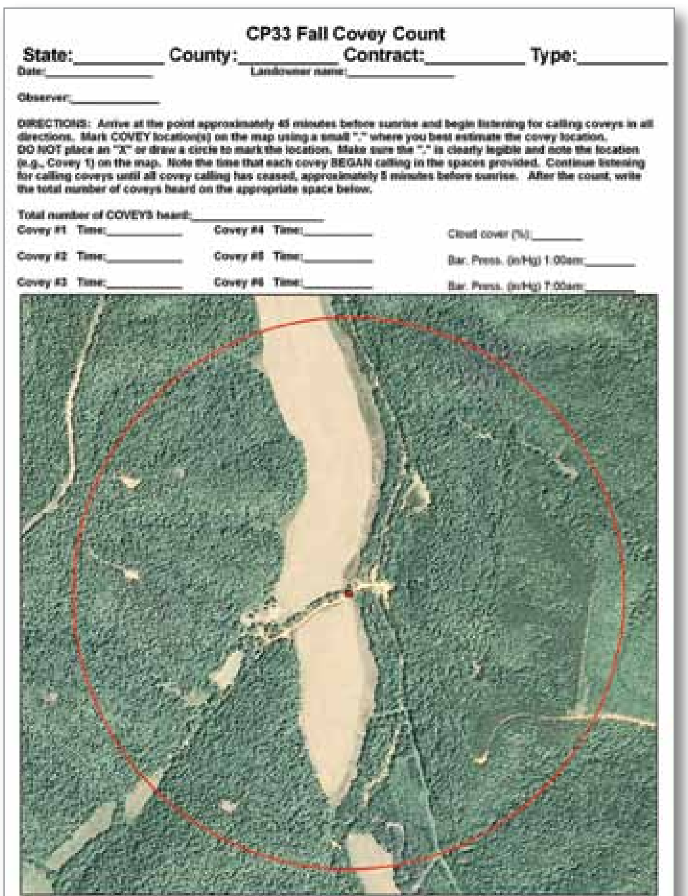


Figure 3. Distribution of survey points in 14 states as part of the national CP33 monitoring program 2006-2011 overlaid on Bird Conservation Region, state, and county boundaries.

each 2007-2011 growing season (May-August) on all monitored CP33 buffers in most states (Table 1). Vegetation sampling methods varied by state; however, the majority of states followed standardized vegetation sampling protocols outlined in the CP33 monitoring protocol (Burger et al. 2006). Vegetation transects included 10 equally-spaced sampling points systematically distributed along midpoints of each buffer. Multiple layering of buffer vegetation required independent estimation of percent cover within each vegetation category (native warm season grass, exotic, forb, legume, woody, bare ground, litter) within a 1-m^2 Daubenmire-type frame (Daubenmire 1959) for each vegetation transect point within the buffer. Buffer width was also recorded at each sampling point for comparison to contract width. Other metrics included verification of buffer establishment, percent of entire buffer in native, exotic, and shrub/woody cover, and percentage and description of non-compliant activities.


CP33 Fall Covey Count

State:________ County:________ Contract:________ Type:________

Date:________ Landowner name:________

Observer:________

DIRECTIONS: Arrive at the point approximately 45 minutes before sunrise and begin listening for calling coveys in all directions. Mark COVEY location(s) on the map using a small "." where you best estimate the covey location. DO NOT place an "X" or draw a circle to mark the location. Make sure the "." is clearly legible and note the location (e.g., Covey 1) on the map. Note the time that each covey BEGAN calling in the spaces provided. Continue listening for calling coveys until all covey calling has ceased, approximately 5 minutes before sunrise. After the count, write the total number of coveys heard on the appropriate space below.

Total number of COVEYS heard:________

Covey #1 Time:________ Covey #4 Time:________ Cloud cover (%):________

Covey #2 Time:________ Covey #5 Time:________ Bar. Press. (in/Hg) 1:00am:________

Covey #3 Time:________ Covey #6 Time:________ Bar. Press. (in/Hg) 7:00am:________

Figure 4. Example of a data recording sheet for fall bobwhite covey surveys in which estimated covey locations were marked on georeferenced NAIP imagery. The outer red circle represents a 500 m radius around the point. Exact distance measurements were later recorded in Arc GIS.

One of the primary objectives of the Phase II component (2009-2011) of the CP33 monitoring program was to evaluate bobwhite and upland bird response following the contract period when mid-contract management (MCM) was scheduled to be initiated (generally contract year 4). To successfully evaluate differences in bird densities following MCM, it was required that MCM activities be qualified and if possible quantified within CP33 buffers. We approached evaluation of MCM activities in 2 ways. First was to simply inquire to the landowner if MCM activities had been implemented on his/her CP33 buffers during the previous year, and if so, what type of activities took place (e.g., disking, burning, herbicide, etc.). However, in recognizing the potential limitations of this approach, we also included an in-field visual assessment of MCM activities conducted by experienced individuals during annual vegetation transect surveys. This included recording percent of the buffer that appeared to be managed and what type of management appeared to have taken place. We also requested that if possible management be delineated (hand-drawn) on an aerial photograph of the buffered fields, with the objective of calculating area metrics by year and MCM type in a GIS.

Analysis

Breeding season and autumn densities were estimated using point-transect distance sampling methods outlined in the CP33 monitoring protocol (Burger et al. 2006). We conducted analysis of 2006-2011 breeding season and 2006-2008 covey data using a 3-tiered approach, with results generated over all survey sites, regionally (i.e., within each BCR), and at the state level. We analyzed breeding season data independently for each priority species and autumn bobwhite covey data using conventional distance sampling (CDS) and multiple-covariate distance sampling (MCDS) engines in program DISTANCE 6.0 (Thomas et al. 2010). Distance sampling uses distances to detected individuals to calculate probabilities of detection, which are then incorporated into density estimates. Since habitat type and vegetation structure may influence the probability of detection of an individual, one of our primary objectives included evaluating potential differences in detectability on CP33 buffered vs. non-buffered fields using stratification and covariates.

2006-2011 Breeding Seasons

We analyzed breeding season data independently for each priority species using up to 6 distance intervals in which data were recorded (0-25, 26-50, 51-100, 101-250, 251-500, >501 m). Depending on sample size we assessed several levels of stratification of the detection function (by region, habitat type (CP33 buffered vs. non-buffered), year, habitat type within year) and compared these to a pooled detection function within and without covariates (region, habitat type, year, or combinations). We right-truncated data to a distance where detection probability g(w) fell to at most 0.1. We used model selection via Akaike's Information Criteria (AIC; Akaike 1973) to evaluate fits of 3 key function models (uniform, half-normal, hazard rate) to the distance data and determine the best level of stratification/covariates and best approximating model of the detection function at each scale (global, fully stratified, stratified by type). When no models competed (ΔAIC > 2.0), we based model selection on the minimum AIC value, goodness of fit of the model, and probability density function plots generated for each model (Buckland et al. 2001). If stratified and global detection function models competed (ΔAIC < 2.0) and both stratification schemes exhibited acceptable fit, we selected the model with the lowest AIC value (Buckland et al. 2001). Once a model was selected we evaluated addition of series adjustments to improve fit of the key function model (half-normal – cosine or hermite polynomial, hazard rate – cosine, uniform – simple polynomial or cosine) using AIC (Buckland 1992). If key function models within the selected level of stratification competed (ΔAIC < 2.0) and models demonstrated variable density estimates, we accounted for model uncertainty using model averaging in a nonparametric bootstrap (B = 1000). We used point estimates of density for single model analyses, and averaged bootstrap estimates of density for analyses that incorporated model averaging. We compared species-specific density (*D*) estimates at each spatial scale using simple ($D_{buffered} - D_{non\text{-}buffered}$) and relative effect sizes (simple effect size/ $D_{non\text{-}buffered}$). We calculated confidence intervals (95%) for effect sizes and determined significance of difference between $D_{buffered}$ and $D_{non\text{-}buffered}$ by an effect size confidence interval including zero.

2006-2008 Fall Covey Counts

We used CDS and MCDS methods (outlined above) in DISTANCE 6.0 to estimate overall, BCR- and state-level bobwhite covey densities each year. However we conducted analysis on ungrouped data (i.e., using exact distances) in all BCR's and states (except the Central Mixed-grass Prairie (BCR 19)/Texas sites). If sample size allowed, we accounted for outliers in the data (which cause difficulties in model-fitting) by right-truncating the 10% of observations with largest detection distances prior to analysis (Buckland et al. 2001). Evaluation of stratification regimes and fit of key function models for each spatial scale was identical to breeding season analyses (described above). Similar to the breeding season analysis, we based model selection on both the minimum AIC value and on evaluation of the fit of the detection function and probability density plots generated for each model. Because flushing of coveys was not required by the field protocol, covey density was the only estimable parameter in this data set; therefore extrapolation of covey density to bird density is limited. We compared covey densities at each spatial scale using simple and relative effect sizes (described above). Confidence intervals (95%) were calculated for effect sizes and significance of difference between covey density in buffered and non-buffered strata was determined by an effect size confidence interval crossing zero.

Incorporating Wellendorf et al.'s adjustments

With *a priori* knowledge that extraneous factors in the environment will influence calling rate (i.e., availability for detection) of bobwhite coveys, we also incorporated the adjustments suggested by Wellendorf et al. (2004). We used a logistic regression equation that incorporates the number of adjacent calling coveys, 6-hr change in barometric pressure (1am-7am; in/Hg), % cloud cover, and wind speed (km/hr) during each survey to estimate a calling probability. We interpreted the posterior probability from the logistic regression as a point-specific calling probability. We then divided the number of coveys detected at a point by the point-specific calling probability to generate an adjusted point-specific estimate of total coveys. We then used the national, BCR-level, or state-level detection functions and the distance-based density estimation equation (Buckland et al. 2001), ran a nonparametric bootstrap (*B*=1000), and generated an average adjusted density estimate and 95% confidence intervals.

Results

2006-2011 Breeding Seasons

Densities were variable across states/regions, and by species, but generally followed the same trends in each region across years for each species. Because of limitations with sample size and range for some species, we could not report density estimates for all 10 BCRs. However, data from all survey points were included in overall density estimates. Histograms representing state, regional, and overall densities (± 95% confidence intervals) are presented below and tables containing densities (males/ha), effect sizes, and confidence intervals on effect size (as a measure of significance) for each species are listed in Appendix A. Tables and graphics of results are also available for download at the CP33 monitoring program website at http://www.fwrc.msstate.edu/bobwhite/. Note state density estimates typically exhibit greater variability than regional and national estimates due to limitations in sample size. Note also that we re-analyzed all data for the final 6-year report, thus density estimates from previous years (2006-2010) may have changed slightly as the updated detection functions were used to inform annual density estimates.

Northern Bobwhite

Breeding season bobwhite density was consistently greater on CP33 buffered than non-buffered fields each year from 2006-2011 over the 14-state study area, though densities on non-buffered and buffered fields exhibited a linear decrease from 2009-2011 (Figure 5). Density on buffered fields peaked in 2009 at 0.23 males/ha (1 male/10.8 ac), with a net difference in density from 1 male/22 ac on non-buffered fields to 1 male/10.8 ac on buffered fields. Effect size (i.e., difference in density on buffered vs. non-buffered fields) relative to density on non-buffered fields ranged between 85-109% annually across years (Appendix A), suggesting breeding season bobwhite densities typically doubled or nearly doubled in row-crop fields containing CP33 buffers compared to non-buffered fields. Bobwhite in most regions exhibited positive response to CP33 buffers in nearly all years, however densities and

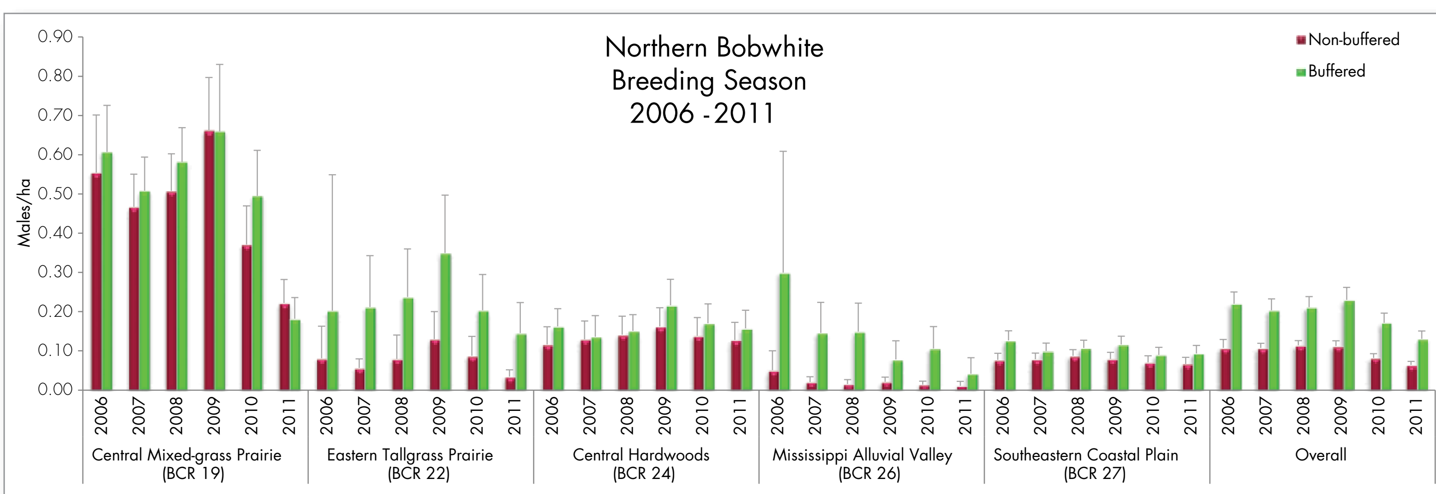


Figure 5. Breeding season bobwhite density estimates (males/ha ± 95% CI) on row-crop fields buffered with CP33 vs. non-buffered fields in the Central Mixed-grass Prairie, Eastern Tallgrass Prairie, Central Hardwoods, Mississippi Alluvial Valley, and Southeastern Coastal Plain Bird Conservation Regions (BCR) (2006-2011). Data from all survey sites (including those in peripheral BCRs) were included in overall density estimates.

effect size varied across regions and annually, suggesting differences in effect of CP33 buffers across regions. Bobwhite densities on buffered and non-buffered fields in the Central Mixed-grass Prairie region (BCR 19; with sites in TX and NE (2007-2011 only) were 4-5 times greater than all other regions in most years, but response to CP33 buffers was limited and effect size varied substantially across years (Figure 5). Note that severe drought in the summer of 2011 likely drove the precipitous decline in bobwhite densities on buffered and non-buffered fields compared to previous years. The Eastern Tallgrass Prairie region (BCR 22; with sites in IA, IN, IL, MO, NE [2007-2011 only], and OH) exhibited strong positive measures of effect on fields buffered with CP33 compared to non-buffered fields (Figure 5). However, densities and effect size peaked in 2009 with 0.22 greater males/ha on buffered fields, and declined every year since. Bobwhite densities on non-buffered fields in the Central Hardwoods region (BCR 24; with sites in IN, KY, MO, and TN) were substantially greater than on CP33 buffered fields compared to most other regions and were consistent across years. Substantially greater bobwhite densities on non-buffered fields suggests the landscape and/or farming practices in the Central Hardwoods region facilitates better baseline bobwhite populations than neighboring regions (e.g., Eastern Tallgrass Prairie). Sample size was limited and baseline bobwhite densities on non-buffered fields in the intensively cropped and historically bottomland hardwood forested Mississippi Alluvial Valley region (BCR 26; with sites in AR (2007-2011 only), MO, and MS) were critically low (Figure 5). However, bobwhite responded strongly to the establishment of native grass buffers in this region and exhibited the greatest effect size, relative to non-buffered fields of all the regions (265-873% greater density on buffered fields across years), though densities on buffered fields exhibited declines across the 6-year period. Finally, bobwhite densities in the Southeastern Coastal Plain region (BCR 27; with sites in GA, KY, MS, NC (2007-2011 only), SC, and TN) experienced little annual variation and positive but slight effects size on buffered compared to non-buffered fields (Figure 5). Baseline densities on non-buffered fields and densities on buffered fields resembled densities observed in the Central Hardwoods region, but scaled lower. Bobwhite densities and effect sizes varied by state and across year. Densities on buffered fields were greatest in Nebraska, Illinois and Texas, however density on non-buffered fields was also high in Texas, and thus exhibiting little effect of CP33 buffers (Appendix A). State-level densities exhibited greater variability than regional estimates due to limitations in sample size.

Dickcissel

Dickcissels exhibited a strong positive relationship with row-crop fields containing CP33 buffers in all regions and years except the Central Mixed-grass Prairie in 2006. Effect size increased annually over all survey sites from 2006-2010, with a peak of 0.6 greater males/ha on buffered than non-buffered fields in 2010, followed by a decrease in 2011 (Figure 6). Effect size relative to controls ranged from 85-119%, suggesting addition of CP33 buffers doubled density of dickcissels compared to non-buffered fields (Appendix A). The greatest dickcissel densities across years on buffered and non-buffered fields occurred in the

Mississippi Alluvial Valley region, though estimates were less precise than other regions. Effect size increased from 2006 and peaked at 4.21 greater males/ha on buffered vs. non-buffered fields in 2010, and decreased in 2011, though effect size relative to density on non-buffered fields peaked at 587% in 2011. Densities on buffered and non-buffered fields were similar across the Central Mixed-grass Prairie, Eastern Tallgrass Prairie, and Central Hardwoods regions, with all but one comparison in the Central Mixed-grass Prairie showing positive response to CP33 buffers. Differences in density fluctuation by year across regions suggests regional trends in population size, presumably due to weather or other geographically broad processes. States in the eastern portion of the Southeastern Coastal Plain (GA, NC, SC) are effectively out of the dickcissel breeding range, therefore density estimates on buffered and non-buffered fields were expected to be lower there than in other regions (Figure 6). Low sample size or limited geographic range disallowed reliable density estimation for dickcissel in GA, NC, OH, SC, and TN. Dickcissel densities were greatest in Arkansas, followed by Illinois, Nebraska, and Missouri (Appendix A).

Field Sparrow

Similar to dickcissels, field sparrows also exhibited a strong and consistent positive relationship with fields containing CP33 buffers (Figure 7). However, small sample size from sites located peripherally to the field sparrow range precluded density estimates for the Central Mixed-grass Prairie and Mississippi Alluvial Valley regions. Response to CP33 buffers was consistent across years (0.15 – 0.19 greater males/ha on buffered fields), with effect size peaking in 2009 and densities on buffer fields double that of non-buffered fields through 2011 (Appendix A). Response to CP33 buffers was strong in all regions, with peak field sparrow densities and effect size on buffered fields in the Eastern Tallgrass Prairie region (Figure 7). Field sparrows in the Southeastern Coastal Plain region exhibited the least response to CP33 buffers compared to other regions, and densities were variable due to limited sample size in the western portion of

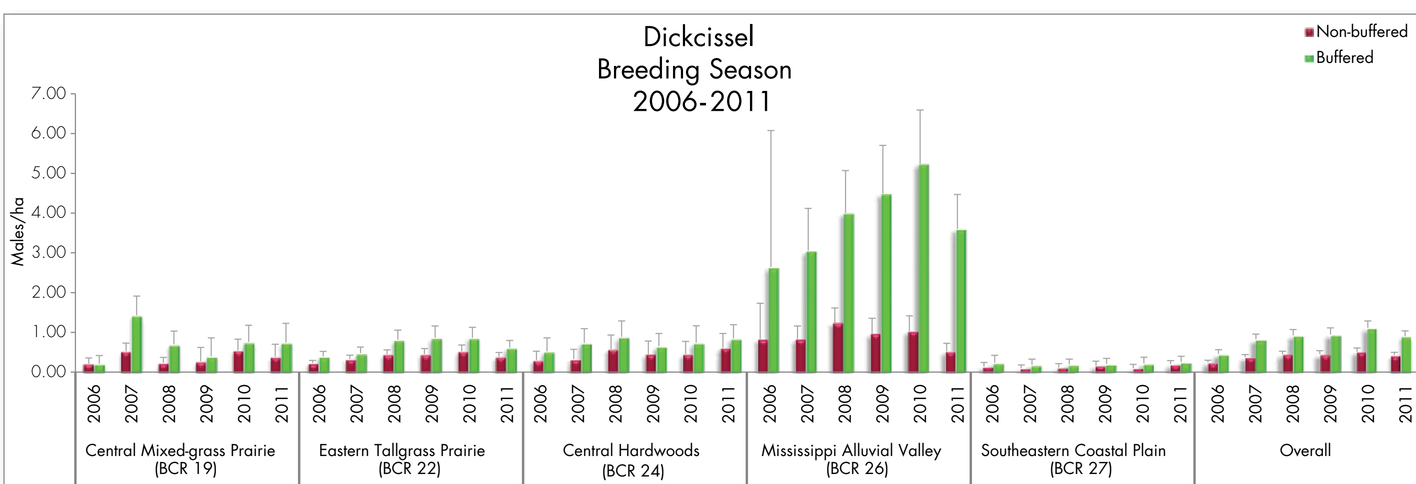


Figure 6. BCR-level and overall breeding season dickcissel density (males/ha) on surveyed CP33 buffered and non-buffered row-crop fields from 2006-2011. Data from all survey sites were included in the overall density estimate. Survey sites in GA, NC, and SC were excluded from analyses as sites in these states are effectively out of the dickcissel range. Error bars represent 95% confidence intervals.

Results

the region. The greatest state-level field sparrow densities occurred on fields with CP33 buffers in Illinois and Nebraska, though variability was high in each state. States varied in density but all exhibited positive effects of CP33 (Appendix A). Field sparrows were not recorded in Arkansas and Texas due to range limits. The lowest field sparrow densities (buffered and non-buffered fields) were recorded in Iowa, North Carolina, and South Carolina across years.

Indigo Bunting

Response by indigo buntings to CP33 buffers was typically positive, but variable across regions and years. Density on fields with CP33 buffers decreased each year from 2006-2011, as did the general trend in effect size across all survey fields (Figure 8). A similar trend was observed in the Southeastern Coastal Plain region where effect size also decreased across years. Indigo bunting densities and response to CP33 buffers

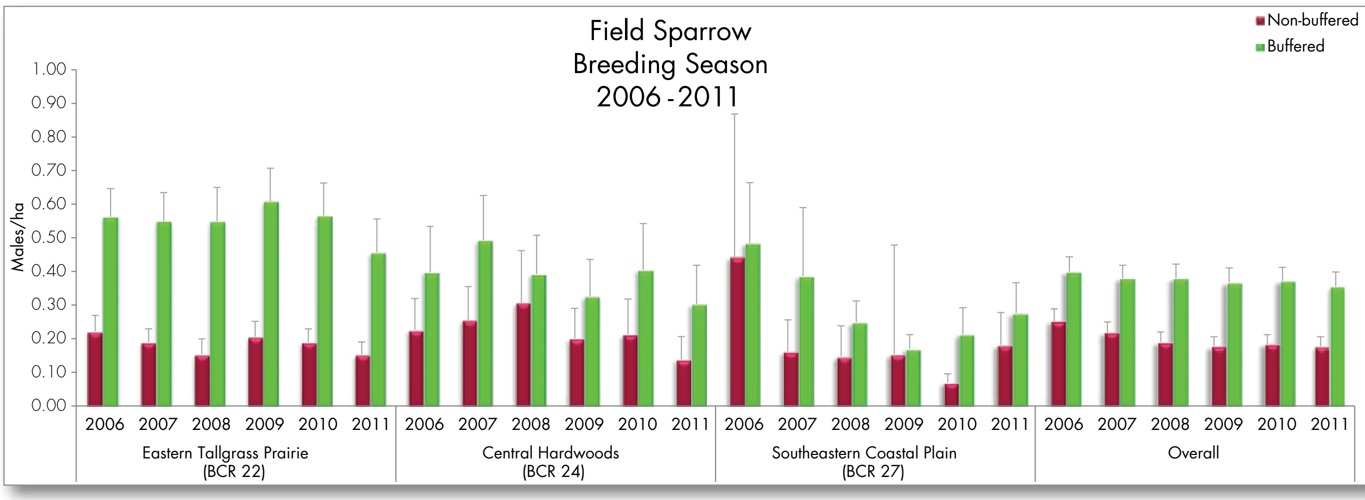


Figure 7. BCR-level and overall breeding season field sparrow density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. The Central Mixed-grass Prairie region (BCR 19) was not evaluated as the majority of survey sites are in TX which is effectively out of the field sparrow range; data from the remaining survey sites were included in the overall density estimate. Error bars represent 95% confidence intervals.

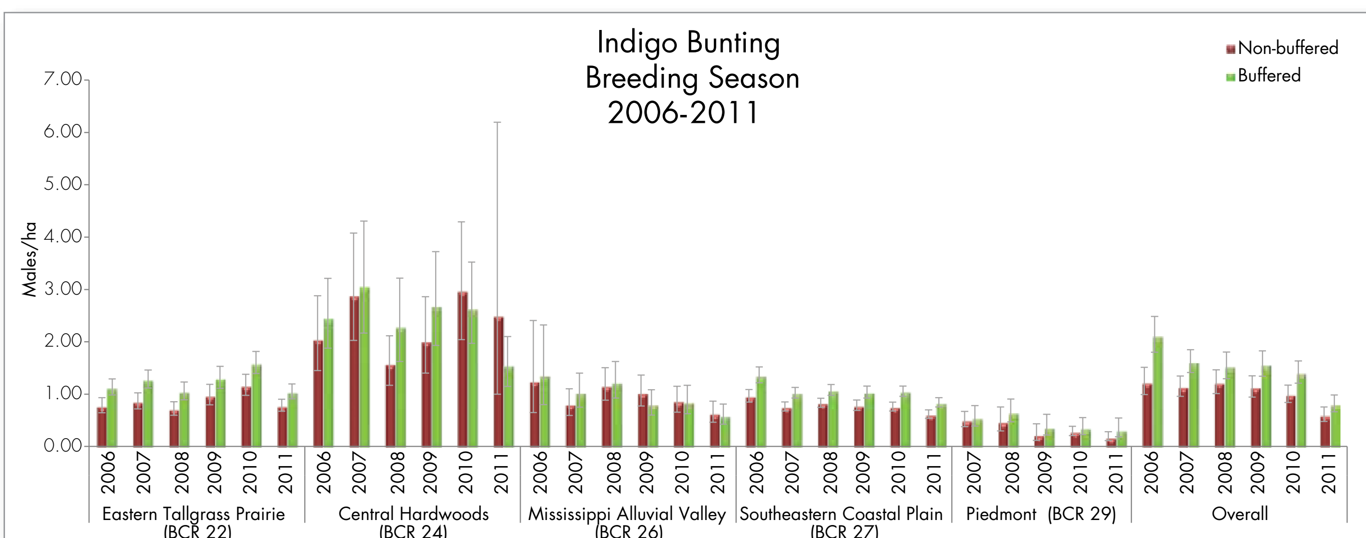


Figure 8. BCR-level and overall breeding season indigo bunting density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. The Central Mixed-grass Prairie (BCR 19) was not evaluated as the majority of survey sites are in TX which is effectively out of the indigo bunting range; data from the remaining survey sites were included in the overall density estimate. Error bars represent 95% confidence intervals.

was consistent across years on buffered and non-buffered fields in the Eastern Tallgrass Prairie, with 0.3-0.4 greater males/ha on buffered fields across years. Indigo bunting densities were greatest in the Central Hardwoods region, but positive effects of buffers diminished after 2009, which was also observed in the Mississippi Alluvial Valley regions, though densities were lower there than in the Central Hardwoods. Note the Central Mixed-grass Prairie region was excluded from analyses and reporting due to sites being peripheral to the primary indigo bunting range. Indigo bunting densities were greatest in Kentucky, Tennessee, Indiana and Illinois, but also exhibited the greatest amount of variability compared to other states (Appendix A). Illinois, Ohio, and Tennessee exhibited substantial response to CP33 buffers by indigo buntings, up to 318% greater male indigo buntings/ha on fields with CP33 buffers relative to fields without buffers. Note Nebraska and Texas were not included in state-level analyses for indigo bunting.

Eastern Meadowlark

Eastern meadowlark density on CP33 buffered and non-buffered fields varied widely across years and regions, though densities were typically similar to that of bobwhite (Figure 9). Eastern meadowlarks demonstrated only negligible density differences over all survey sites across years, with only one year exhibiting a positive effect of CP33 buffers. Densities on buffered and non-buffered fields declined overall from 2008 to 2011. We observed the lowest meadowlark densities in the Southeastern Coastal Plain region and greatest densities in the Central Mixed-grass Prairie and Eastern Tallgrass Prairie region. Consistent positive meadowlark responses were observed in the Eastern Tallgrass Prairie and Central Hardwoods region, with the greatest effect size observed in the Eastern Tallgrass Prairie region in 2010 (0.12 males/ha greater on buffered fields). Meadowlarks exhibited greater densities on non-buffered row-crop fields in most years in the Central Mixed-grass Prairie, Mississippi Alluvial Valley, and Southeastern Coastal Plain regions.

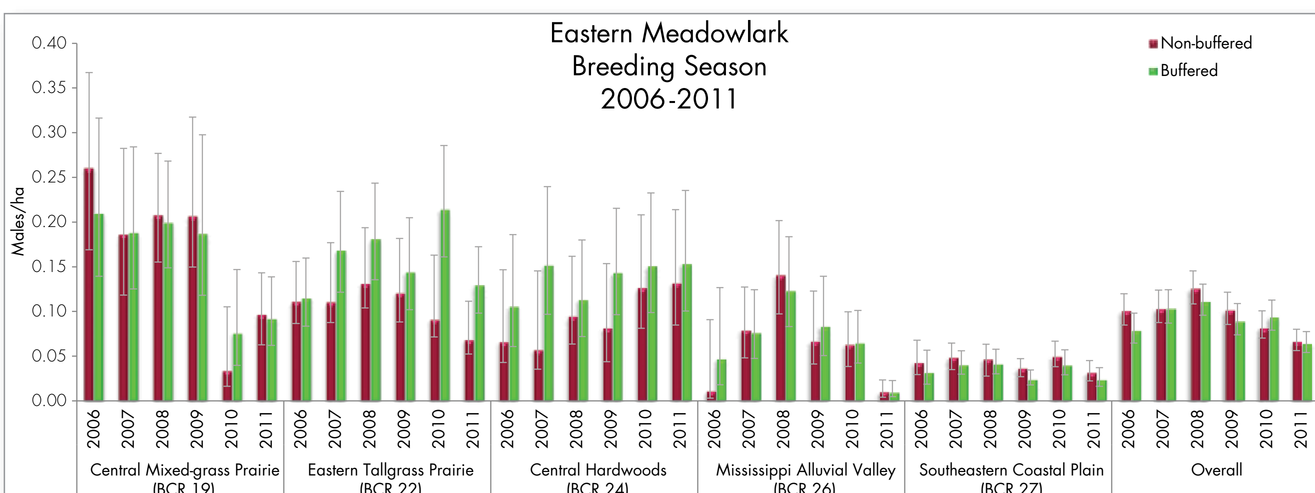


Figure 9. BCR-level and overall breeding season eastern meadowlark density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. Data from all BCR's are included in the overall density estimate. Error bars represent 95% confidence intervals.

Densities were also variable across states, with the greatest densities on buffered and non-buffered fields observed in Nebraska and Illinois (Appendix A). Meadowlark densities in Nebraska typically exhibited no or minimal differences on fields with vs. fields without CP33 buffers. However densities in Illinois were typically greater on fields with CP33 buffers. The majority of remaining states exhibited low densities on buffered and non-buffered fields within very little differences in density estimates.

Grasshopper Sparrow

Grasshopper sparrow density was similar to that observed in bobwhite and eastern meadowlark (typically <0.1 males/ha). We excluded Georgia, North Carolina, and South Carolina from overall and regional analyses as sites had no grasshopper sparrow detections and are effectively out of the range. Relationships among grasshopper sparrows and CP33 buffers varied by region and year but was negligible from 2006-2008, positive from 2009-2010, and negligible again in 2011 overall sites (Figure 10). Density on buffered and non-buffered fields was greatest (and also most variable) in the Central Mixed-grass Prairie region, though relationships to buffers was positive in 2008-2009 and negative in 2006 and 2010-2011. Densities in the Eastern Tallgrass Prairie and Central Hardwoods regions were similar to those observed over all sites. Exclusion of sites resulted in very low densities (<0.05 males/ha) in the Southeastern Coastal Plain Region. Also, there were not enough observations to analyze grasshopper sparrow density in the Mississippi Alluvial valley or independently within each state.

Eastern Kingbird

Density of eastern kingbirds was slightly greater than grasshopper sparrows (0.1-0.2 males/ha) over all sites, but similar to bobwhite and eastern meadowlark (Figure 11). However, relationship among kingbirds and CP33 buffers was slightly and consistently negative over all sites across years. We observed the greatest kingbird densities on non-buffered fields and greatest negative effect size in the Southeastern Coastal Plain (BCR 27) region each year. The greatest densities on buffered fields and greatest positive effect sizes

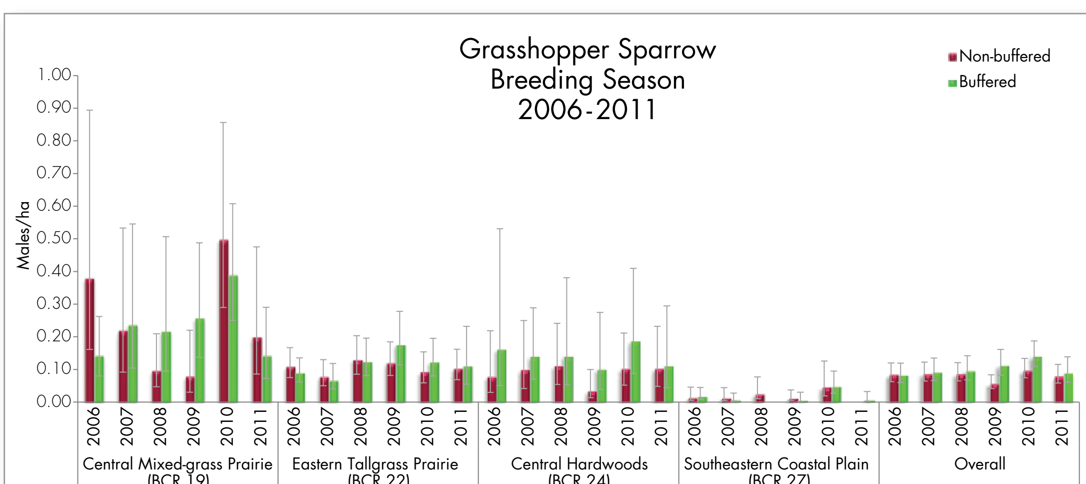


Figure 10. BCR-level and overall breeding season grasshopper sparrow density (males/ha) on surveyed CP33 buffered and non-buffered fields 2006-2011. Error bars represent 95% confidence intervals.

occurred in the Central Mixed-grass Prairie (BCR 19) region each year, though estimates were highly variable. Kingbird densities in the Eastern Tallgrass Prairie (BCR 22) and Central Hardwoods (BCR 24) regions were similar to overall estimates, though effect size was positive in all years except 2008 in the Central Hardwoods region. Similar to grasshopper sparrow there were not enough observations to analyze density in the Mississippi Alluvial Valley (BCR 26) region or independently within each state.

Other Species

We could not estimate regional or state-level density for vesper sparrow, painted bunting, Bell's vireo, upland sandpiper, and scissor-tailed flycatcher by region due to limited geographic range and/or sample size. We detected 445 vesper sparrows in 6 states (IA, IL, IN, MO, NE, OH) from 2006-2011. Vesper sparrows exhibited low densities (0.01-0.04 males/ha) on buffered and non-buffered fields, but positive response to CP33 buffers in 4 out of 6 years (60-157% greater density on buffered fields; Figure 12).

We detected 576 painted buntings in 4 states (AR, MS, SC, TX) from 2006-2011. Painted buntings also exhibited low densities (0.03-0.08 males/ha) on buffered and non-buffered fields, with positive relationships with CP33 buffers only observed in 2006, no difference on buffered and non-buffered fields in 2007-2008, and negative relationship to buffers in 2009-2011 (Figure 13).

We detected 249 Bell's vireos in 3 states (AR, MO, NE) from 2006-2011. Bell's vireo densities were low from 2006-2009, but increased on buffered and non-buffered fields in 2010-2011, with positive response to CP33 buffers in 4 of 6 years (31-41% greater density on buffered fields) (Figure 14).

We detected 271 upland sandpipers in 2 states (MO, NE) from 2006-2011. Upland sandpipers densities were <0.06 males/ha across years, but highly variable each year. Densities were greater on non-buffered fields in all years except 2008 (Figure 15).

We detected 1435 scissor-tailed flycatchers in 2 states (AR, TX). Scissor-tailed flycatchers were abundant within their range, but densities on

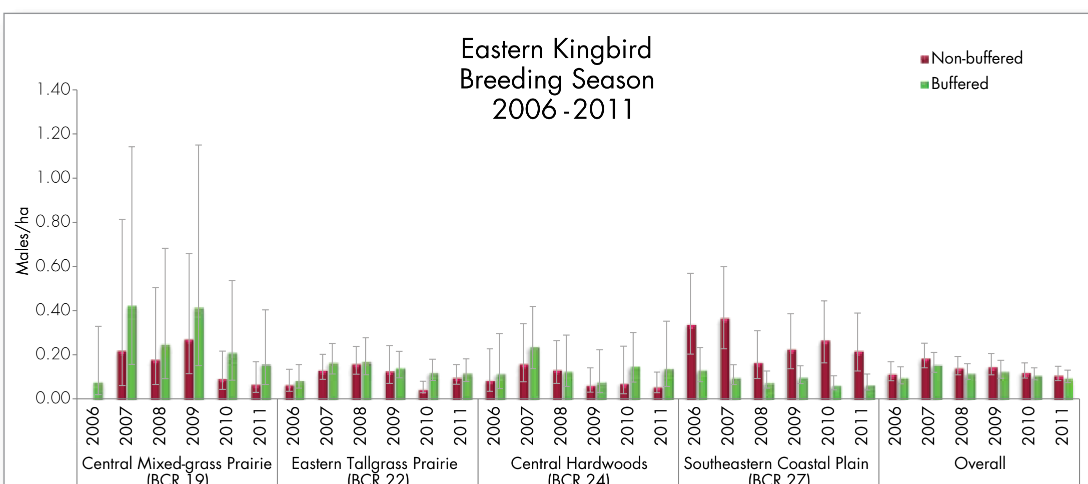


Figure 11. BCR-level and overall breeding season eastern kingbird density (males/ha) on surveyed CP33 buffered and non-buffered fields 2006-2011. Error bars represent 95% confidence intervals.

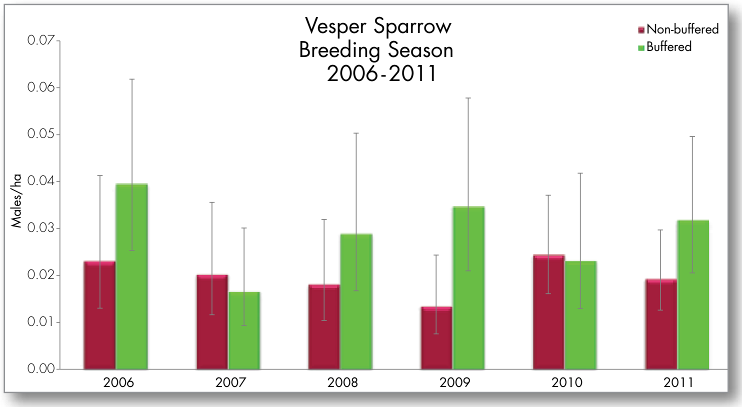


Figure 12. Breeding season vesper sparrow density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. Vesper sparrows were detected in IA, IL, IN, and OH. Error bars represent 95% confidence intervals.

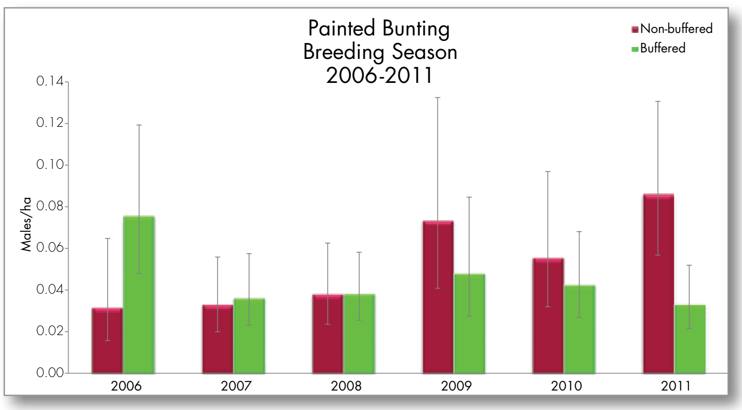


Figure 13. Breeding season painted bunting density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. Painted buntings were detected in AR, MS, SC, and TX. Error bars represent 95% confidence intervals.

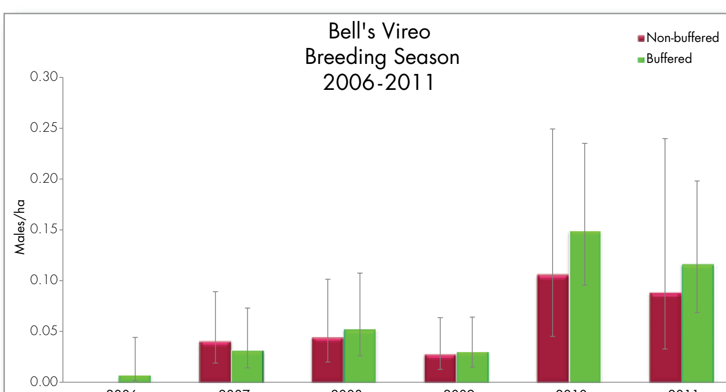


Figure 14. Breeding season Bell's vireo density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. Bell's vireos were detected in AR, MO, and NE. Error bars represent 95% confidence intervals.

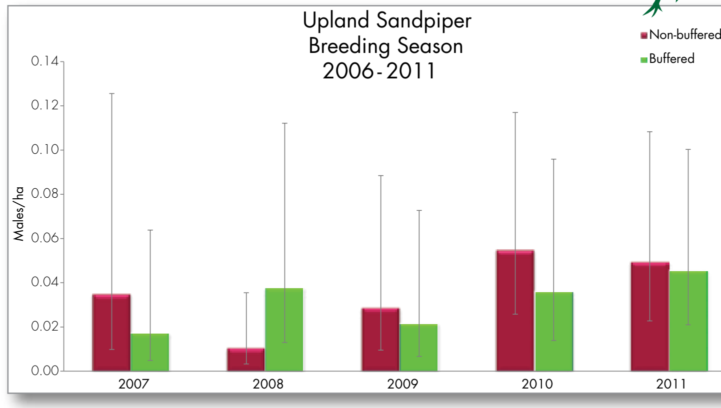


Figure 15. Breeding season upland sandpiper density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. Upland sandpipers were detected in MO and NE. Error bars represent 95% confidence intervals.

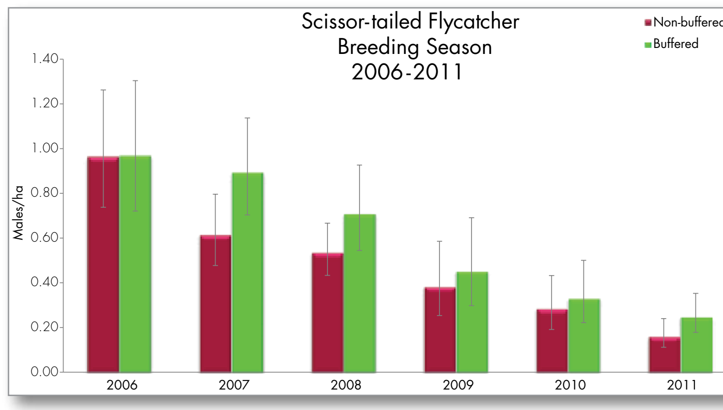


Figure 16. Breeding season scissor-tailed flycatcher density (individuals/ha) on surveyed CP33 buffered and non-buffered fields in AR and TX from 2006-2011. Error bars represent 95% confidence intervals.

buffered and non-buffered fields decreased each year from 2006-2011. Density of scissor-tailed flycatchers was greater on fields with CP33 buffers each year from 2007-2011 (16-53% greater males/ ha on buffered fields) (Figure 16).

The remaining priority species were too low in number to report density estimates. Over the 6-year study there were 69 Henslow's sparrow observations (control=32, CP33=37), and 54 logger-headed shrike observations (control=23, CP33=31).

2006-2008 Fall Bobwhite Coveys

We observed substantively greater density of bobwhite coveys on CP33 buffered compared to non-buffered fields in each year from 2006 to 2008. In addition, we observed an increasing effect of CP33 in the landscape, with simple and relative effect sizes increasing annually from 2006-2008 (Figure 17). Relative $((D_{CP33}-D_{non\text{-}buffered})/D_{non\text{-}buffered})$ effect size for non-adjusted overall covey density increased from 50% in 2006 to 110% in 2008; however density of coveys on both CP33 buffered and non-buffered fields decreased in 2008 compared to 2007 (Figure 17). Overall covey density increased slightly on non-buffered fields from 2006 (0.029 coveys/ha (1 covey/85 ac)) to 2007 (0.033 coveys/ha (1 covey/75 ac)), but decreased in 2008 to 0.023 coveys/ha (1 covey/107 ac) (Figure 17). Although covey density on CP33 buffered fields remained 0.5 to 2 times greater than on non-buffered fields over all survey sites, density increased from 0.044 coveys/ ha (1 covey/56 ac) in 2006 to 0.056 coveys/ha (1 covey/44 ac) in 2007 on buffered fields, but decreased to 0.049 coveys/ha (1 covey/51 ac) in 2008.

When covey detections were adjusted for calling rate based on 6-hr change in barometric pressure, cloud cover, wind speed, and number of adjacent calling coveys (Wellendorf et al. 2004) we observed 1.5 to 2 times greater densities on

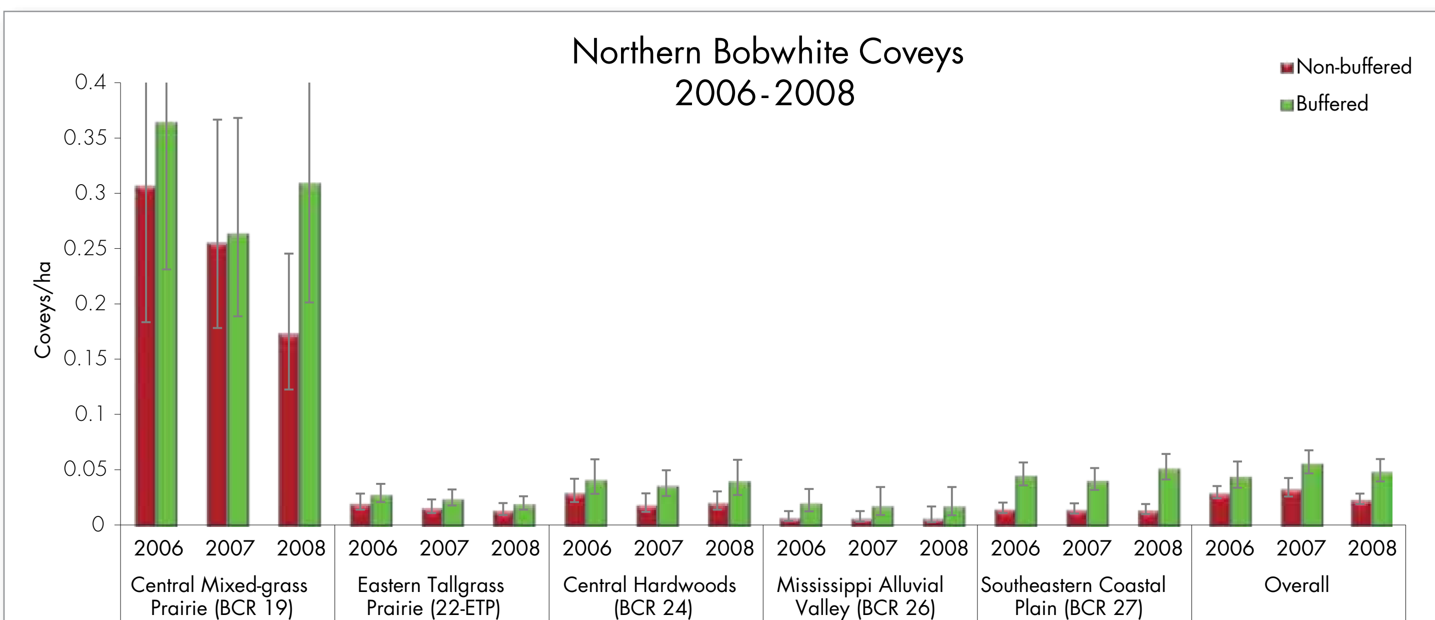


Figure 17. BCR-level and overall non-adjusted northern bobwhite covey density (coveys/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2008. Data from all BCR's are included in the overall density estimate. Error bars represent 95% confidence intervals.

both CP33 buffered and non-buffered fields, but a decrease in relative effect sizes in all 3 years (Figure 18).

Covey densities were ≥3 times greater on CP33 buffered than non-buffered fields in the Southeastern Coastal Plain (BCR 27) annually from 2006-2008 (Figure 17). We observed a slight decrease in covey density on buffered fields and no change on non-buffered fields in BCR 27 from 2006 to 2007, resulting in a decrease in simple and relative effect size (0.030 coveys/ha (205%) in 2006 to 0.026 coveys/ha (183%) in 2007. However, density increased substantially in 2008 on buffered fields, while decreasing on non-buffered fields, and resulting in a 278% relative effect size. When covey densities were adjusted for calling rate (Wellendorf et al. 2004) we observed nearly double the estimate of density on both CP33 buffered and non-buffered fields in each year for BCR 27, but a decrease in relative effect size (Figure 18).

Non-adjusted covey densities in the Eastern Tallgrass Prairie (BCR 22) were 40-50% greater on CP33 buffered than non-buffered fields annually from 2006-2008 (Figure 17). Covey density decreased on CP33 buffered and non-buffered fields from 2006-2008; however simple and relative effect size was greatest in 2007 (0.008 coveys/ha; 50%). Covey density estimates on both CP33 buffered and non-buffered fields in the Eastern Tallgrass Prairie region were lower than estimates for all other BCR's evaluated, except the Mississippi Alluvial Valley (BCR 26) (Figure 17). Although incorporation of an adjustment for calling rate (Wellendorf et al.2004) nearly doubled density estimates on both buffered and non-buffered fields in each year, we observed similar relative effect sizes and slightly decreased simple effect sizes compared to non-adjusted density estimates (Figure 18).

Covey densities were approximately 40-100% greater annually on CP33 buffered than non-buffered fields in the Central Hardwoods (BCR 24)

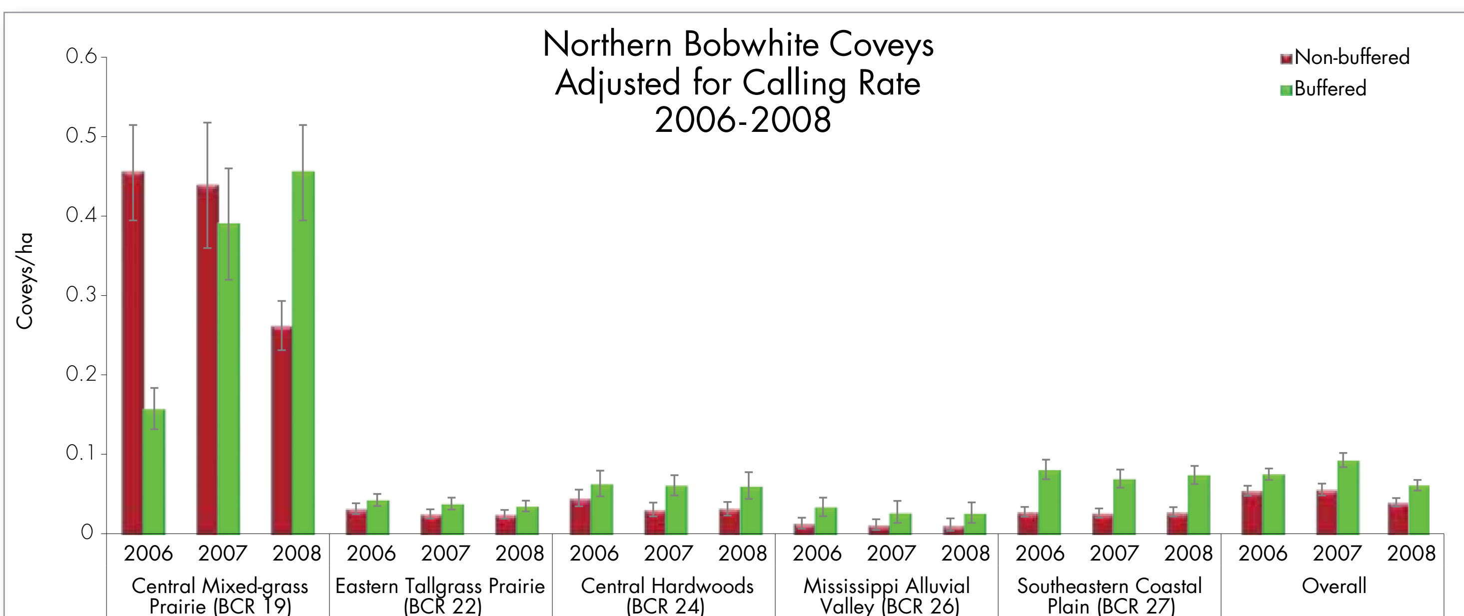


Figure 18. BCR-level and overall northern bobwhite covey density estimates (coveys/ha) on surveyed CP33 buffered and non-buffered fields adjusted for number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004). Data from all BCRs are included in the overall density estimate. Error bars represent 95% confidence intervals.

region from 2006 to 2008 (Figure 17). Density on both buffered and non-buffered fields decreased slightly from 2006 to 2007, followed by a slight increase in 2008. Although densities varied, simple and relative effect size increased annually from 0.012 coveys/ha (39%) in 2006 to 0.020 coveys/ha (95%) in 2008. Density estimates in the Central Hardwoods region were 1.5 to 2 times greater following incorporation of a calling rate adjustment (Wellendorf et al. 2004) on CP33 buffered and non-buffered fields when compared to non-adjusted density estimates (Figure 18). However, simple and relative effect size for adjusted density estimates peaked in 2007 (0.031 coveys/ha (102%) rather than 2008.

Inference from the Central Mixed-grass Prairie (BCR 19) is limited because fall survey sites were only located in TX from 2006-2008. Because of limited sample size, annual results from the Central Mixed-grass Prairie region are highly variable (Figure 17). Covey density was greatest on both CP33 buffered and non-buffered fields in 2006, and decreased in both strata through 2008 (Figure 17). Additionally, similar to breeding season results, density of bobwhite coveys was much higher in the Central Mixed-grass Prairie region than all other BCR's and the overall estimate. Effect size decreased from 0.057 coveys/ha (19%) in 2006 to 0.008 coveys/ha (3%) in 2007, followed by an increase to 0.136 coveys/ha (78%) in 2008. Incorporation of calling rate adjustments (Wellendorf et al. 2004) produced ~1.5 times greater density on non-buffered fields each year and on CP33 buffered fields in 2007 and 2008, but a decrease in the 2006 CP33 density estimate (Figure 18). This shift in 2006 adjusted density estimate in the CP33 strata caused a reversal of effect from the non-adjusted to adjusted density estimate. We again suggest using caution when interpreting estimates from this region, as they are largely variable.

Although sample size was limited in the Mississippi Alluvial Valley (BCR 26), a detection function based off the 3-year data set allowed

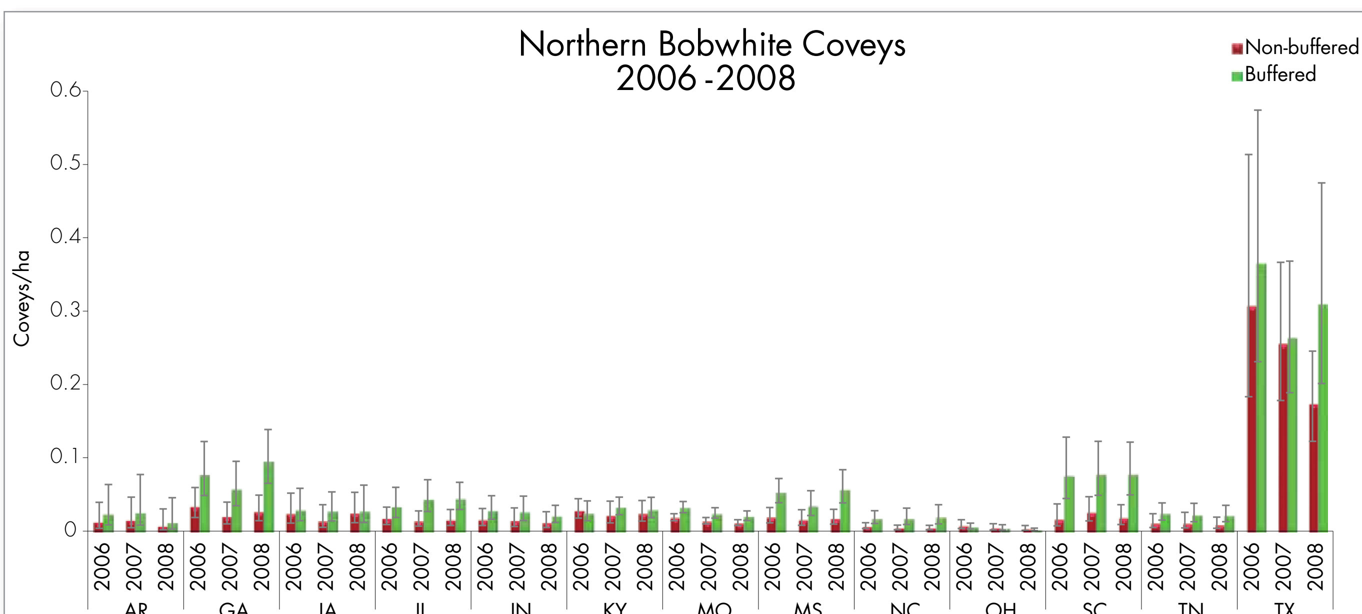


Figure 19. State-level non-adjusted northern bobwhite covey density (coveys/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2008. Error bars represent 95% confidence intervals.

for annual estimation of covey densities. Covey density was 170-194% greater on CP33 buffered than non-buffered fields annually from 2006 to 2008 (Figure 17). However, year-specific densities within non-buffered and CP33 buffered strata were minimally variable across years. Effect size decreased from 0.013 coveys/ha (194%) in 2006 to 0.011 coveys/ha (170%) in 2008. Similar to most other BCR's, density estimates in this region were nearly 2 times greater for non-buffered fields and 1.5 times greater for CP33 buffered fields following incorporation of adjustments for calling rate (Wellendorf et al. 2004) (Figure 18). However annual relative effect size was lower for calling-rate adjusted densities than for non-adjusted density estimates.

State-level non-adjusted covey densities ranged from 0.006 (OH) to 0.364 (TX) coveys/ha on CP33 buffered fields, and from 0.006 (NC) to 0.307 (TX) coveys/ha on non-buffered fields in 2006, from 0.003 (OH) to 0.264 (TX) coveys/ha on CP33 buffered fields, and from 0.003 (NC) to 0.256 (TX) coveys/ha on non-buffered fields in 2007, and from 0.001 (OH) to 0.309 (TX) coveys/ha on CP33 buffered fields, and from 0.003 (OH) to 0.173 (TX) coveys/ha on non-buffered fields in 2008 (Figure 19). Most states exhibited substantially greater covey densities on CP33 buffered than non-buffered fields each year. However, OH maintained the lowest densities on both non-buffered and buffered fields and the smallest effect when compared to the remaining states. As noted previously, TX exhibited much greater densities on non-buffered and buffered fields than the remaining states, though results for TX were highly variable. SC and GA also had a very strong response to CP33 in the landscape in all 3 years of the study. Effect size ranged from -0.004 (KY) to 0.059 (SC) coveys/ha in 2006, from -0.001 (OH) to 0.052 (SC) coveys/ha in 2007, and from -0.001 (OH) to 0.136 (TX) coveys/ha in 2008. Relative effect size ranged from -25% (OH) to 367% (SC) in 2006, from -18% (OH) to 326% (NC) in 2007, and from -51% (OH) to 373% (NC) in 2008. Similar to the BCR-level analyses, incorporation of adjustments for calling rate (Wellendorf et al. 2004) generally doubled

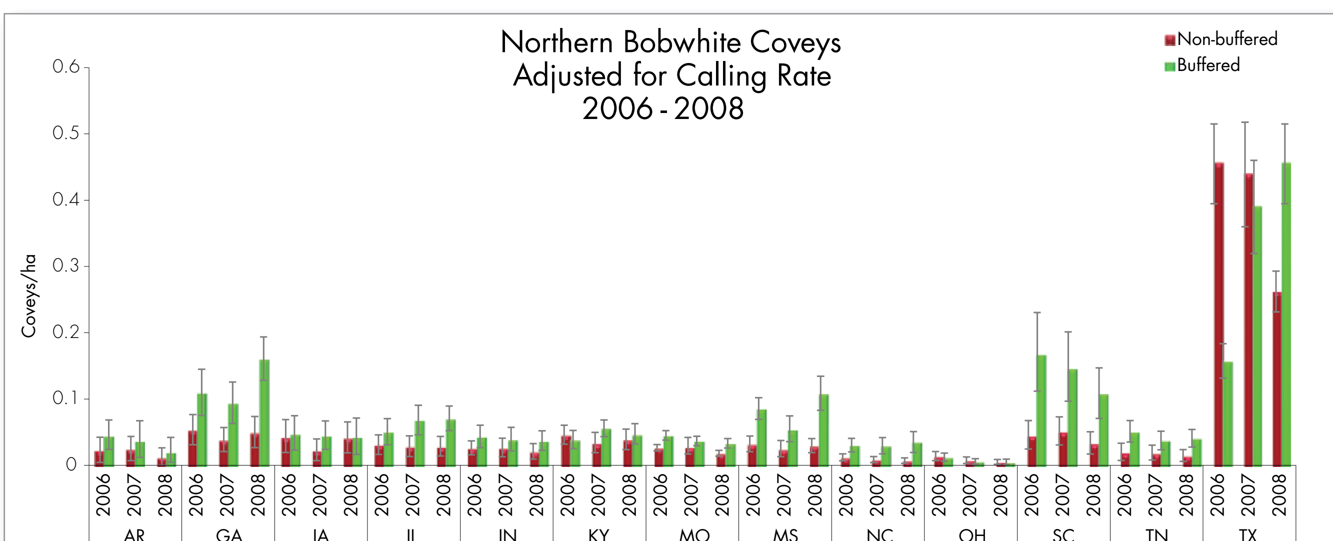


Figure 20. State-level northern bobwhite covey density estimates (coveys/ha) on surveyed CP33 buffered and non-buffered fields adjusted for number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004). Error bars represent 95% confidence intervals.

state-level estimates of density in all 3 years, but reflected similar trends in relative effect size (Figure 20).

Vegetation/Mid-contract Management Evaluation

We conducted vegetation surveys following state-level modifications to a standardized vegetation protocol in 15 states in 2007, 10 states in 2008, and 14 states in 2009-2011. We conducted 25,087 vegetation transect plots across states since 2007. We also conducted 1,140 mid-contract management assessments across most states since 2009. Mean contract width established by the conservation plan in the CRP contract over all surveyed CP33 contracts was 87 ft (Table 3). Cover was established on 94% of CP33 buffers by 2011. Of the states collecting information on perceived dominant taxa within buffers, 46% were dominated by unspecified grasses (i.e., not specified if native or exotic), 22% were dominated by forbs (including legumes), 10% were dominated by exotic species, and 7% were dominated by NWSG across all years (Figure 21).

Average cover of trees and shrubs in CP33 buffers was minimal across the study period (3.19% shrubs, 3.65% trees. For states that quantified noncompliant activities, percent noncompliance averaged 7.29% across years. Predominant noncompliance activities included mowing, road/turnrow/driven, equipment disturbance/parking, planted to crops and herbicide drift (Table 3). Mean buffer width at 10 systematically placed points along each CP33 field was 76 ft across all years and states, 11 ft. less than mean contracted buffer width, but nearly identical to the midpoint of the allowable contract buffer width range (90-120 ft.). Vegetation transect surveys at 10 systematically placed points along each CP33 buffer demonstrated that mean percentage cover was less than 30% in each vegetation category across years (NWSG, forb, legume, woody, exotic, litter, bare) (Figure 22).

We observed consistent mean coverage of NWSG, forb, legume, and exotic cover each

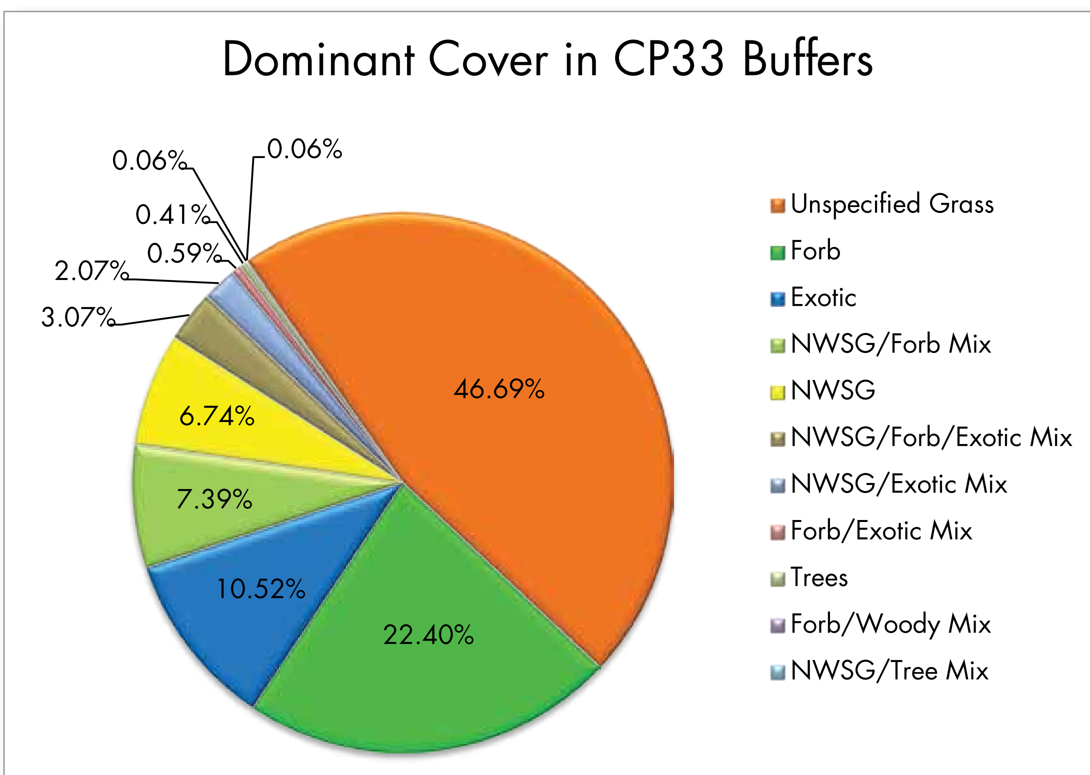


Figure 21. Dominant cover in CP33 buffers specified by vegetation transect surveys (2007- 2011).

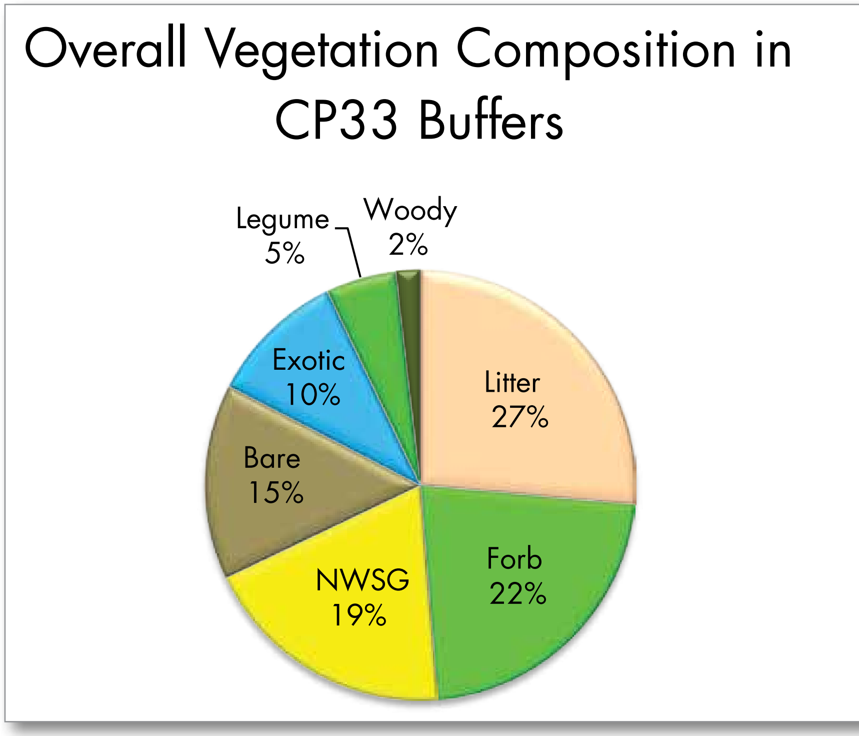


Figure 22. Average composition of vegetation in CP33 buffers across all states and years in the national CP33 monitoring program (2007-2011).

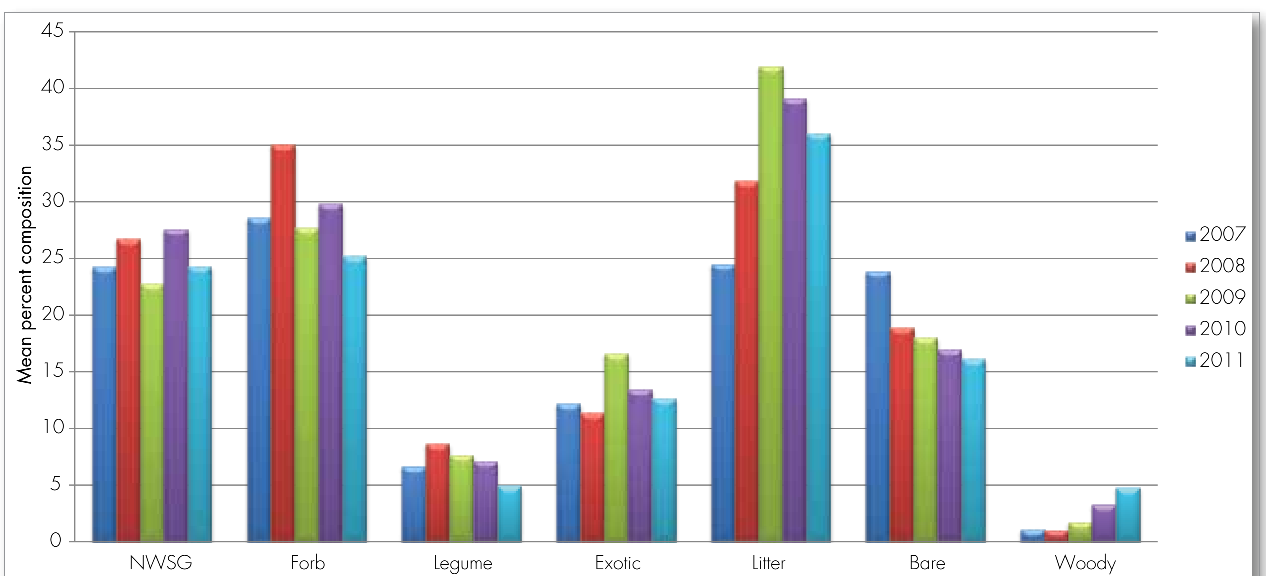


Figure 23. Mean annual percent cover of native warm-season grasses (NWSG), forbs, legumes, woody plants, exotics, litter, and bare ground within CP33 upland habitat buffers averaged over all states (2007-2011).

year, with NWSG and forb cover twice that of legume and exotic cover (Figure 23, Table 5). Common exotics present in CP33 buffers in both years included bahiagrass (*Paspalum notatum*), Bermudagrass (*Cynodon dactylon*), tall fescue (*Schedonorus phoenix*), Johnsongrass (*Sorghum halepense*), and brome (*Bromus* spp.) (Table 3). Percent cover of litter increased to 42% in 2009, then decreased through 2011. Bare ground exhibited incremental decreases across years, but was typically 15-20% (Figure 23). Percent coverage of woody species remained <5%, but increased across years (Figure 23). However, we suggest using caution when comparing estimates across years due to the difference in number of states conducting vegetation surveys in each year.

Of the 13 states that participated in the mid-contract management (MCM) survey, 12 took part in the initial landowner inquiry. Over 70% of landowners with fields containing CP33 survey points within those 12 states were contacted regarding MCM activities. Of the subsample of landowners that were contacted, 47% indicated that some type of MCM activity took place on their CP33 buffers from 2008-2011 (53% indicated no MCM activities had been implemented) (Figure 24). For landowners that indicated MCM activities took place, 47% had disked, and the remainder had burned, applied herbicide, applied a combination of methods, or mowed their buffers (mowing is not an accepted MCM practice under CRP-479 except to facilitate subsequent burning, disking, or herbicide) (Figure 24).

In-field assessment of MCM activities conducted during vegetation surveys indicated discrepancies from landowner inquiries, likely due to difficulties experienced by the surveyor in determining presence and/or extent of MCM activities. Within 13 states conducting in-field MCM assessments, MCM activities appeared to take place on 32% of buffered fields (68% of buffers appeared unmanaged, or the surveyor was uncertain if management had occurred) (Figure 25). For fields with apparent MCM activities, the majority (55%) appeared disked, whereas burning, herbicide, mowing, and combination methods accounted for 28% of MCM activities (Figure 21). For buffers where MCM was apparent, 47% of buffer area appeared to be managed within fields.

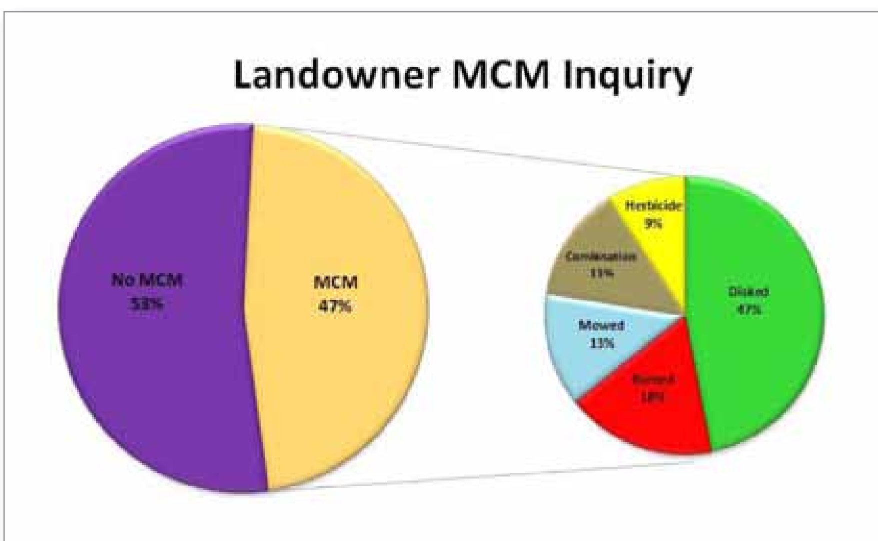


Figure 24. Percent of landowners indicating that mid-contract management (MCM) was/ was not implemented on CP33 buffers in 12 states from 2009-2011 (left). For landowners indicating MCM was implemented, type of management activity landowners indicated (right).

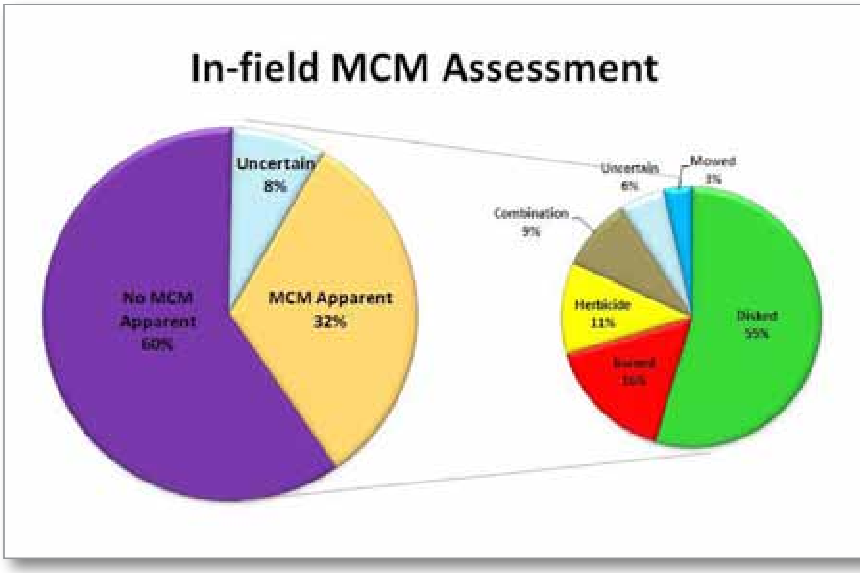


Figure 25. Percent of mid-contract management (MCM) that was, was not, or could not be determined apparent during in-field MCM assessment (left). For fields where MCM was apparent, type of management activities that appeared to have occurred (right).

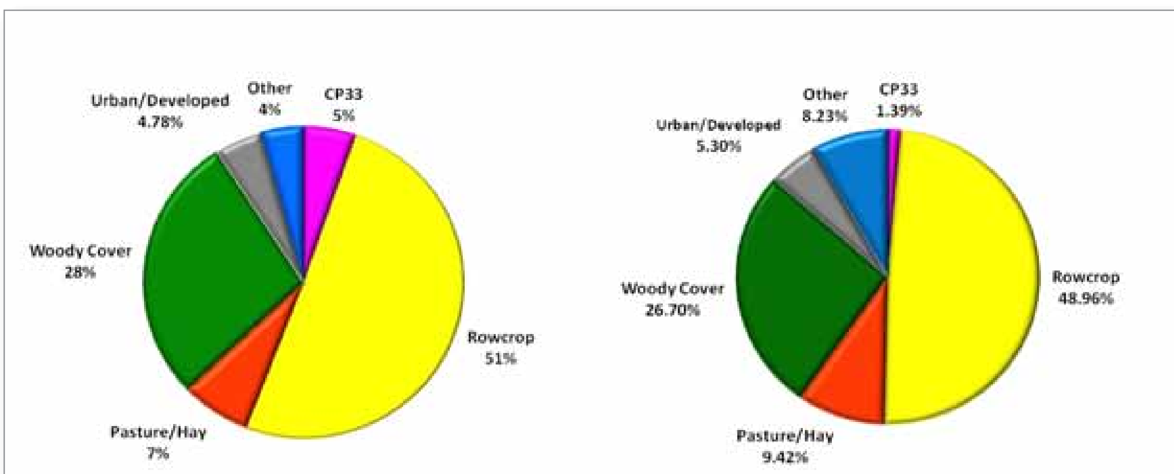


Figure 26. Percent composition of land cover/land use at a 500 m (left) and 1500 m (right) radii around fields containing CP33 upland habitat buffers in 14 states.

Interpretation

The CP33 practice and national monitoring program exemplify the iterative nature of strategic habitat conservation, whereby careful biological planning led to the design, delivery, and subsequent evaluation and refinement of a targeted conservation practice. The success of this process from inception to refinement is proof that strategic habitat conservation is viable in practice, and that conservation investments produce worthwhile dividends when strategically implemented. The national CP33 monitoring program affords the opportunity to fully implement the strategic habitat conservation/adaptive management approach through evaluation of multi-scale multi-year bird response to the CP33 upland habitat buffer practice. The continuation of monitoring through Phase II (2009-2011) extended this evaluation through 6 years of the 10-year CP33 contract, allowing for evaluation of bird response following buffer succession and management over time, not simply immediately following establishment.

We observed measurable and substantive differences in breeding season densities of bobwhite and several priority songbirds and in fall bobwhite covey densities between CP33 buffered and non-buffered fields. Differences in densities illustrate that positive effects of buffers are sustained for bobwhite and several priority bird species up to 6 years following buffer establishment. However, the magnitude of effect varied among species, states, and BCR's. Though magnitude of effect varied, greater densities of male breeding bobwhite and fall bobwhite coveys in most regions demonstrates that bobwhite exhibit a disproportionate response to CP33 upland habitat buffers which compose only 5% of the landscape at 500 m and 1.4% of the landscape at 1500 m around a survey point (Figure 26).

However regional and annual differences in response to buffers were apparent for all species, highlighting likely variability in baseline populations, and variable response to CP33 buffers among regions and years. For example, throughout the study bobwhite densities have consistently been greatest but with the least effect size in the Central Mixed-grass Prairie region (BCR 19), exemplifying likely differences in baseline bobwhite abundances compared to other regions. Ample baseline bobwhite abundance paired with little effect of CP33 may reflect quality bobwhite habitat in landscapes around both buffered and non-buffered fields in that region. In contrast, densities and effect sizes have increased in the Eastern Tallgrass Prairie each year, suggesting strong breeding season response to the habitat provided by CP33 buffers in that region. These differences highlight the need to evaluate bird response to conservation practices at a regional scale, and will provide feedback regarding where practice establishment will be of greatest benefit. These differences are further complicated by evidence of reduced effect in the Eastern Tallgrass Prairie region during the non-breeding season compared to breeding season estimates. Roseberry and Klimstra (1984) demonstrated that non-breeding bobwhites showed a relatively uniform spatial distribution in intensively cultivated areas (such as IL), but that nesting bobwhites shifted to a non-uniform distribution and used areas containing grass-litter and annual forbs, such as fallow fields, herbaceous roadsides and fencerows. Bobwhites in the Eastern Tallgrass Prairie appeared to exhibit this behavior, with heavy use of CP33 during the breeding season, but limited use during the fall. One plausible explanation for this is a lack of shrub/woody cover provided by the CP33 buffers, which is a particularly important vegetative component for bobwhite in the fall in the northern portion of their range (Roseberry and Klimstra 1984).

For regions where bobwhite response to CP33 buffers is greatest, the question remains whether observed effect sizes have the capacity to contribute toward meeting the population recovery goals of the National Bobwhite Conservation Initiative. Clearly densities observed on CP33 buffers are insufficient to restore "huntable" bobwhite populations (assuming 1 bird/ac is huntable) in each region. However, when implemented strategically in the landscape and in conjunction with other conservation management practices, upland habitat buffers have the potential to increase bobwhite abundances in a tangible manner. Diffuse application of CP33 buffers on the landscape may not produce increases in bobwhite densities comparable to buffers applied in a strategic and targeted manner in areas where potential bobwhite response will be greatest. Targeted enrollment to achieve >10% change in land use within a focal priority area might produce the greatest response (Smith and Burger 2009). Judicious CP33 buffer implementation coupled with a conservation management strategy may provide a means of producing densities that contribute toward bobwhite population recovery.

Many other grassland and scrub-successional birds suffer similar population trajectories as bobwhite and may realize benefits from upland habitat buffer establishment. Our results suggest that over the past 6 years some upland bird species exhibit very strong response to CP33, regionally and overall (e.g., dickcissel, field sparrow), whereas some species exhibit variable or negligible response (e.g., eastern meadowlark, grasshopper sparrow). Results from analysis of priority bird species suggests there are clear differences in habitat needs across the grassland and scrub-successional bird "guilds", whereby targeting a single management strategy toward an entire guild may fail for some species. Variable needs for vegetation composition and structure and habitat patch size for priority species warrants caution when designing and implementing a single conservation practice to benefit all species of a particular guild. The solution is to be realistic that not all management strategies will provide equal benefits across species with differing habitat and patch size requirements. To truly effect population increases in all severely declining grassland/scrub-successional bird species, a strategic habitat conservation approach using a suite of available conservation practices and programs should be applied.

Evaluation of vegetation composition, buffer characteristics, and mid-contract management activities has revealed interesting trends regarding sustainability of buffer quality over time. Percent litter has increased and percent bare ground has decreased annually since 2007, suggesting breeding season habitat quality for bobwhite within buffers has the potential to diminish. However, there remained an exemplary mix of NWSG, forb, bare ground, and litter cover over time (<30-40% for each metric), suggesting habitat quality in buffers may be sustained through mid-contract management activities. Mandatory mid-contract management, intended to maintain habitat quality by setting back succession and reducing litter accumulation had been applied to <50% of surveyed buffers in 2009. This partial implementation of MCM across CP33 buffers may explain why percent litter continues to increase and percent bare ground continues to decrease.

The CP33 monitoring program also exemplifies the feasibility of coordinated monitoring across geopolitical boundaries. When the practice was initiated bobwhite managers strove for standardization of data collection via a coordinated monitoring effort to provide inference regarding bobwhite response to upland habitat buffers, beyond the scale at which the data were collected (i.e., at the state level). Moreover, coordination of CP33 monitoring via a single entity provided states with additional resources for implementation of required monitoring, which facilitated multi-scale synthesis of analysis and results. CP33 monitoring exemplifies that coordinated monitoring across multiple agencies/organizations is entirely possible and can be very successful given the appropriate funding mechanism and monitoring infrastructure.

Summary of Project Reports

Peer-reviewed Publications

Evans, K.O., L.W. Burger, S.K. Riffell, M.D. Smith. (In Review). Assessing multi-region benefits of a strategically targeted agricultural conservation practice. Conservation Biology.

Evans, K.O., L.W. Burger, S.K. Riffell, M.D. Smith, D. J. Twedt, R. R. Wilson, S. Vorisek, C. Rideout, and K. Heyden. (In Review). Avian community response to conservation buffers in agricultural landscapes during winter. Wildlife Society Bulletin.

Evans, K.O., L.W. Burger, Jr., C.S. Oedekoven, M.D. Smith, S.K. Riffell, S.T. Buckland. 2013. Multi-region response to conservation buffers targeted for northern bobwhite. Journal of Wildlife Management. DOI: 10.1002/jwmg.502

Oedekoven, C.S., S.T. Buckland, M.L. Mackenzie, K.O. Evans, L.W. Burger, Jr. 2013. Improving distance sampling: accounting for covariates and non-independency between sampled sites. Journal of Applied Ecology. doi: 10.1111/1365-2664.12065

Oedekoven, C.S., S.T. Buckland, M.L. Mackenzie, R. King, K.O. Evans, and L.W. Burger, Jr. (In Review). Using hierarchical centering to facilitate a reversible jump MCMC algorithm for random effects models. Biometrics.

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Theses/Dissertations

Bowling, S. 2012. Influence of landscape metrics on northern bobwhite populations in agricultural landscapes. Thesis. North Carolina State University, Raleigh, NC.

Evans, K. O. 2012. Dissertation. Multi-scale response of upland birds to targeted agricultural conservation. Mississippi State University, Mississippi State, MS.

McConnell, M. D. 2011. Using Precision Agriculture Technology to Evaluate environmental and economic tradeoffs of alternative CP33 Enrollments. M.S. Thesis, Mississippi State University. 103 pp.

Summary of Project Reports

Popular/Semi-technical Publications

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State Cooperators

- Arkansas Game and Fish Commission
- Audubon Texas
- Georgia Department of Natural Resources
- Illinois Department of Natural Resources
- Ballard Nature Center (Illinois)
- Indiana Department of Natural Resources
- Iowa Department of Natural Resources

State Cooperators (continued)

- Kentucky Department of Fish and Wildlife Resources
- Kentucky Chapter of The Wildlife Society
- Mississippi Department of Wildlife, Fisheries, and Parks
- Mississippi State University, Department of Wildlife, Fisheries and Aquaculture
- Missouri Department of Conservation
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Tables

Table 1. Distribution of CP33 monitoring during 2006-2011 breeding season, autumn covey, and vegetation/mid-contract management surveys.

Year	Breeding season	Autumn covey	Vegetation/ mid-contract management
2006	GA, IA, IL, IN, KY, MO, MS, OH, SC, TN, TX	AR, GA, IA, IL, IN, KY, MO, MS, NC, OH, SC, TN, TX	GA, MS
2007	AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX	AR, GA, IA, IL, IN, KY MO, MS, NC, OH, SC, TN, TX	AR, GA, IA, IL, IN, KS, KY MO, MS, NC, NE, OH, SC, TN, TX
2008	AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX	AR, GA, IA, IL, IN, KY MO, MS, NC, OH, SC, TN, TX	GA, IA, IN, KY, MS, MO, NC, NE, SC, TN
2009	AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX	MO	AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX
2010	AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX		AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX
2011	AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX		AR, GA, IA, IL, IN, KY MO, MS, NC, NE, OH, SC, TN, TX

Table 2. Priority species (by USGS alpha code) selected for each Bird Conservation Region (BCR) for breeding season CP33 contract monitoring in 2006-2011.

Bird Conservation Region	Species
11- Prairie Potholes	
19-Central Mixed-grass Prairie	BEVI, DICK, EAKI, EAME, FISP, GRSP, INBU, NOBO, PABU, STFL, UPSA
22-Eastern Tallgrass Prairie	DICK, EAKI, EAME, FISP, GRSP, INBU, NOBO, VESP, UPSA
23-Prairie Hardwood Transition	DICK, EAKI, EAME, FISP, INBU, NOBO, VESP
24-Central Hardwoods	DICK, EAKI, EAME, FISP, INBU, NOBO
25-Western Gulf Coast Plain	DICK, EAKI, EAME, INBU, NOBO, PABU
26-Mississippi Alluvial Valley	DICK, EAKI, EAME, FISP, GRSP, INBU, NOBO, PABU
27-Southeast Coastal Plain	DICK, EAKI, EAME, FISP, GRSP, INBU, NOBO, PABU
29-Piedmont	EAKI, EAME, FISP, INBU, NOBO

Table 3. Average designated contract width, method and percentage of cover establishment, and types of exotic species present on surveyed CP33 upland habitat buffers in 15 states from 2007-2011 (note participation by states varied across years).

		Contract Cover[1]			
State	**Mean Contract Width (ft)**	**NR**	**NG**	**Both**	**Exotics Present**
Arkansas	70.83	82%	12%	6%	Bahia, Bermuda, Fescue, Johnson
Georgia	63.00	97%	3%		Bahia, Bermuda, Rye, Other
Illinois	85.21		100%		Brome, Cheat, Fescue, Foxtail
Indiana	69.26	22%	78%		Bluegrass, Brome, C. Thistle, Fescue, Johnson. Orchard, Timothy, Reed Canary
Iowa	N/A	16%	84%		Foxtail
Kansas	79.58	94%	6%		Bermuda, Brome, Fescue, Sand Bur, Other
Kentucky	52.09	98%	2%		Bahia, Fescue, Other
Mississippi	88.16	53%	47%		Bahia, Bermuda, Fescue, Johnson
Missouri	N/A	N/A	N/A		N/A
Nebraska	77.22		100%		Brome, Other
N. Carolina	75.95	100%			Ailanthus, Bermuda, Crabgrass, Fescue, Honey-suckle, Johnson, Kudzu, Rye
Ohio	67.00	2%	98%		Brome, C. Thistle, Fescue, Dandelion, Johnson, Reed Canary, Teasel
S. Carolina	95.44	100%			Bahia, Bermuda, F. Pusley, Rye, Vasey, Other
Tennessee	N/A	N/A	N/A		Bermuda, Bluegrass, C. Thistle, Crabgrass, Fes-cue, Johnson, Orchard, Rye, Sericia
Texas	120.00	N/A	N/A		Bermuda, Johnson, Oats, Wheat
Overall	78.64				

[1]NR=Natural Regeneration; NG=Native Grass Mix; Both=NR and NG

Tables

Table 4. Average percent shrubs, trees, and non-compliance (NC), type of non-compliance activities (in order of prevalence), percent mid-contract management (MCM) and type of mid-contract management activities on surveyed CP33 upland habitat buffers by state (2007-2011).

State	Year	% Shrub	% Tree	% Exotic	% NC	Noncompliance Type
Arkansas	2007	1.03	0.26		2.56	Mow
	2009	0.96	0.60	22.09	21.49	Uncertain, herbicide drift
	2010	1.66	1.00	4.58	0.00	
	2011	9.00	11.28	15.71	5.8	Planted to crops, road/turnrow/driven, mow, equipment/structures, herbicide drift
Georgia	2007	1.00	1.08		7.50	Road/turnrow/driven , planted to crops, mow, equipment disturbance, planted to pine, food plot, equipment/parking/debris/hay
	2008	3.58	1.63		14.18	Mow, planted to crops, road/turnrow/driven, equipment parking
	2009	2.53	2.90	14.88	15.30	Road/turnrow/driven, mow, planted to crops, herbicide drift
	2010	5.40	2.83	12.07	7.40	Planted to crops, mow, hay storage, food plots, road/turnrow/driven, herbicide drift
	2011	4.00	8.00	14.37	16.25	Planted to crops, road/turnrow/driven, mow, food plot, hay, herbicide drift, equipment disturbance, planted to pine
Illinois	2007	0.73	8.71		10.07	Mow, road/turnrow/driven, planted to crops, not contract width,
	2009	2.19	0.63	17.96	6.96	Mow, road/turnrow/driven, herbicide drift, equipment parking
	2010	1.54	3.89	21.25	1.85	Road/driven/turnrow, mow, equipment parking
	2011	1.93	8.26	23.20	1.65	Road/driven/turnrow, mow, equipment parking
Indiana	2007	0.77	2.03		10.91	Herbicide drift, mow, road/driven/turnrow , equipment disturbance
	2008	0.27	0.00		12.27	Mow, herbicide drift, planted to crops, road/turnrow/driven, equipment parking
	2009	0.00	2.48	12.12	9.64	Mow, road/turnrow/driven, planted to crops, equipment parking, herbicide drift
	2010	1.45	1.70	0.00	5.33	Mow, Road/turnrow/driven, planted to crops, herbicide drift
	2011	1.63	1.75	0.00	6.88	Road/turnrow/driven , mow, planted to crops, mow, equipment disturbance, herbicide drift
Iowa	2007	0.13	0.00		N/A	Mow, road/turnrow/driven
	2008	0.26	0.13		N/A	N/A
	2009	1.43	0.71	16.43	N/A	N/A
	2010	0.57	0.95	14.50	N/A	N/A
	2011	2.78	1.11	23.33	N/A	N/A
Kansas	2007	0.53	0.25		2.76	Road/turnrow/driven, mow, equipment parking/debris/hay, underwater

Table 4 (continued). Average percent shrubs, trees, and non-compliance (NC), type of non-compliance activities (in order of prevalence), percent mid-contract management (MCM) and type of mid-contract management activities on surveyed CP33 upland habitat buffers by state (2007-2011).

State	Year	% Shrub	% Tree	% Exotic	% NC	Noncompliance Type
Kentucky	2007	1.00	6.00		15.25	Mow, road/turnrow/driven, equipment parking/debris/hay, planted to crops
	2008	1.07	6.56		21.05	Mow, road/turnrow/driven, equipment storage, barn built
	2009	4.41	6.75	20.75	7.71	Herbicide drift, road/turnrow/driven, mow, planted to crops
	2010	6.64	8.20	22.25	11.78	Herbicide drift, mow, road/driven/turnrow, planted to crops, equipment parking/storage
	2011	4.07	9.30	26.41	21.58	Herbicide drift, planted to crops, mow, road/turnrow/driven, equipment parking
Mississippi	2007	0.00	1.38		7.00	Road/turnrow/driven, planted to crops, mow, equipment disturbance, herbicide drift
	2008	0.28	1.03		0.56	Road/turnrow/driven
	2009	4.11	8.31	49.75	5.66	Mow, road/turnrow/driven
	2010	1.67	2.69	17.59	8.97	Road/driven
	2011	2.14	1.09	27.27	1.36	Planted to crops, mow, herbicide drift
Nebraska	2007	0.46	0.78		7.39	Road/turnrow/driven, herbicide drift, mow, equipment parking, planted to crops
	2008	0.28	0.92		16.25	Road/turnrow/driven, herbicide drift, mow, planted to crops
	2009	1.96	5.35	19.24	7.97	Herbicide drift, planted to crops, mow, road/turnrow/driven
	2010	0.33	1.79	21.38	6.00	Herbicide drift, road/driven/turnrow, planted to crops, mow
	2011	1.36	4.92	26.38	6.85	Herbicide drift, road/driven/turnrow, planted to crops, equipment parking
North Carolina	2007	2.39	3.34		8.73	Road/turnrow/driven, mowed, planted to crops, plowed, herbicide drift, food plot
	2008	2.44	6.58		4.39	Herbicide drift, planted to crops, road/turnrow/driven
	2009	16.54	11.92	17.44	2.56	Mow
	2010	13.15	7.90	15.00	2.56	Mow
	2011	10.00	8.33	13.85	0.87	Mow
Ohio	2007	0.10	0.60		N/A	
	2009	4.28	2.88	17.05	9.23	Mow, driven/equipment parking, herbicide drift
	2010	2.39	0.67	15.99	10.85	Mow, herbicide drift, road/driven, equipment disturbance
	2011	0.73	0.00	1.31	3.00	Mow, herbicide drift, road/driven
South Carolina	2007	2.89	0.97		4.86	Road/turnrow/driven, planted to crops, food plot, mow, equipment parking, herbicide drift
	2008	3.99	1.18		3.22	Road/turnrow/driven, planted to crops, herbicide drift, mow, equipment parking
	2009	8.99	4.87	22.26	N/A	N/A
	2010	13.47	6.69	19.58	0.00	N/A
	2011	12.64	6.28	17.92	0.00	N/A

Table 4 (continued). Average percent shrubs, trees, and non-compliance (NC), type of non-compliance activities (in order of prevalence), percent mid-contract management (MCM) and type of mid-contract management activities on surveyed CP33 upland habitat buffers by state (2007-2011).

State	Year	% Shrub	% Tree	% Exotic	% NC	Noncompliance Type
Tennessee	2007	0.00	0.00		6.28	Mow, equipment parking/debris/hay, road/turnrow/driven, planted to crops, herbicide drift
	2008	0.24	0.12		8.78	Mow
	2009	N/A	N/A	7.85	5.26	Mow, herbicide drift, road/equipment parking/equipment damage, planted to crops
	2010	N/A	N/A	10.10	7.93	Road/driven, planted to crops, mow, herbicide drift, plowed, parking/equipment damage, removed after flood damage
	2011	N/A	N/A	8.08	5.46	Road/driven, planted to crops, herbicide drift, equipment damage, mow, washout
Texas	2007	2.44	4.69		7.46	Mowed, road/turnrow/driven
	2009	6.21	8.76	35.52	1.90	Road/turnrow/driven, plowed
	2010	0.91	0.93	8.24	1.90	Equipment parking
	2011	1.04	5.04	15.88	14.21	Mowed/grazed, equipment parking, buffer too large, fallowed
Overall	2007	0.96	2.15		7.57	
	2008	1.38	2.02		10.09	
	2009	4.47	4.68	21.03	7.81	
	2010	4.10	3.27	14.04	5.38	
	2011	4.72	6.05	16.93	7.75	

Table 5. Average buffer width, percent native warm-season grass (NWSG), forb, legume, exotic vegetation, litter, bare ground, and woody across 10 transect points systematically distributed on each surveyed CP33 upland habitat buffers in 15 states in 2007, 10 states in 2008, and 14 states in 2009-2011.

State	Year	Mean Buffer Width (ft)	% NWSG	% Forb	% Legume	% Exotic	% Litter	% Woody
Arkansas	2007	98.82	34.40	24.34	3.18	9.28	11.02	1.03
	2009	98.72	41.46	13.34	18.38	22.65	46.51	N/A
	2010	111.57	52.69	17.37	10.40	6.45	22.71	0.00
	2011	121.47	32.19	26.64	7.86	12.54	19.43	1.04
Georgia	2007	87.98	8.21	35.34	2.44	15.04	23.58	0.39
	2008	81.10	5.45	31.97	3.27	6.13	35.45	1.19
	2009	82.64	4.91	41.10	5.86	11.64	26.75	N/A
	2010	82.10	7.33	37.20	5.67	9.71	27.71	2.56
	2011	76.34	7.06	22.19	7.56	12.29	38.12	6.98
Illinois	2007	82.33	36.82	15.49	5.06	13.44	13.89	0.16
	2009	84.76	38.54	15.09	4.56	19.85	11.87	0.24
	2010	70.70	37.96	15.93	7.23	20.63	10.11	2.43
	2011	70.78	38.93	14.87	6.61	19.54	11.00	2.52
Indiana	2007	67.44	21.38	30.15	8.58	12.33	18.63	1.01
	2008	76.51	35.43	26.31	8.73	12.78	0.00	0.00
	2009	87.35	29.99	26.97	8.31	11.90	18.97	2.09
	2010	82.55	28.24	29.44	9.55	12.67	13.67	1.74
	2011	81.17	28.06	28.90	4.86	16.97	12.47	3.33
Iowa	2007	111.01	36.68	20.61	3.89	15.91	47.97	0.32
	2008	76.41	61.19	26.25	6.22	2.88	78.12	0.32
	2009	133.46	50.77	33.34	8.97	20.46	46.37	0.14
	2010	64.05	51.95	32.86	7.14	15.42	68.59	0.00
	2011	N/A	38.89	35.26	3.44	19	79.41	0.82
Kansas	2007	106.80	32.50	20.23	3.47	10.28	20.55	0.17
Kentucky	2007	80.16	29.88	21.36	14.53	17.08	27.32	1.44
	2008	77.37	35.21	21.74	20.60	15.86	35.29	1.93
	2009	78.63	30.89	27.40	9.24	18.28	45.85	0.00
	2010	77.33	28.88	27.38	9.75	17.68	51.21	9.35
	2011	76.33	22.33	25.89	8.47	21.15	60.99	9.78
Mississippi	2007	79.07	62.89	42.36	14.68	11.99	22.20	0.14
	2008	N/A	38.00	43.72	13.12	7.71	22.80	0.40
	2009	100.49	5.89	26.46	16.64	51.71	67.90	N/A
	2010	67.14	34.07	20.24	10.09	26.30	72.49	11.73
	2011	130.25	38.59	29.59	8.77	18.09	87.45	4.77

Table 5 (continued). Average buffer width, percent native warm-season grass (NWSG), forb, legume, exotic vegetation, litter, bare ground, and woody across 10 transect points systematically distributed on each surveyed CP33 upland habitat buffers in 15 states in 2007, 10 states in 2008, and 14 states in 2009-2011.

State	Year	Mean Buffer Width (ft)	% NWSG	% Forb	% Legume	% Exotic	% Litter	% Woody
Missouri	2007	N/A	N/A	24.05	N/A	20.18	37.15	0.87
	2008	N/A	N/A	39.93	N/A	22.22	61.14	2.08
	2009	13.18	12.01	18.16	3.59	17.13	57.63	0.48
	2010	23.86	13.20	36.62	7.36	13.00	37.00	2.22
	2011	31.47	14.24	18.48	2.86	6.91	25.49	1.01
Nebraska	2007	77.42	24.67	34.26	11.91	16.00	29.41	1.20
	2008	76.62	28.31	20.79	6.53	16.72	43.36	1.23
	2009	76.69	35.97	20.71	9.03	19.24	32.91	1.58
	2010	63.04	32.99	21.75	8.12	14.61	41.00	1.26
	2011	65.49	31.31	19.93	7.35	14.53	66.68	2.60
North Carolina	2007	74.95	8.28	41.02	3.33	15.37	12.42	2.87
	2008	88.75	8.06	51.22	6.15	20.01	16.15	1.50
	2009	80.86	1.57	42.31	0.00	0.00	16.01	8.17
	2010	68.38	22.51	37.55	0.38	6.38	15.33	5.73
	2011	71.46	19.27	35.50	0.00	8.74	16.03	11.57
Ohio	2007	62.34	29.10	28.30	0.85	8.40	26.20	0.60
	2009	64.08	35.25	33.10	11.33	12.25	85.77	0.49
	2010	75.44	34.55	36.83	8.93	12.63	90.60	0.00
	2011	67.69	43.53	30.85	5.51	0.69	78.40	3.19
South Carolina	2007	92.40	21.63	33.39	2.96	7.03	15.09	1.36
	2008	90.59	19.51	37.11	2.85	7.99	11.60	1.37
	2009	69.60	0.09	38.07	0.14	0.00	12.68	5.44
	2010	20.95	32.99	0.00	8.96	17.53	18.02	
	2011	69.25	20.99	32.79	0.00	12.10	15.54	8.58
Tennessee	2007	74.80	N/A	N/A	N/A	N/A	N/A	N/A
	2008	74.58	N/A	N/A	N/A	14.73	N/A	N/A
	2009	70.25	N/A	N/A	N/A	N/A	N/A	N/A
	2010	71.61	N/A	N/A	N/A	N/A	N/A	N/A
	2011	73.98	N/A	N/A	N/A	N/A	N/A	N/A
Texas	2007	116.12	21.15	30.39	3.72	9.85	18.39	0.48
	2009	159.59	30.29	12.17	3.34	33.38	11.52	0.09
	2010	197.81	68.15	6.44	8.33	8.33	0.93	1.33
	2011	99.92	52.08	15.67	6.08	17.21	21.04	16.92
Overall	2007	86.55	28.28	28.66	6.05	13.01	23.13	0.86
	2008	80.24	28.89	33.23	8.43	12.70	33.77	1.11
	2009	85.74	24.43	26.79	7.64	18.34	36.98	1.87
	2010	76.89	34.27	24.59	7.84	13.95	36.10	3.20
	2011	75.97	24.30	25.22	4.92	12.64	36.06	4.78

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011.

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Northern Bobwhite	19-CMP	2006	0.555	0.064	(0.438-0.701)	0.607	0.054	(0.508-0.726)	0.053	9.48%	(-0.111-0.217)
Northern Bobwhite	19-CMP	2007	0.468	0.038	(0.397-0.550)	0.508	0.040	(0.434-0.594)	0.040	8.65%	(-0.067-0.149)
Northern Bobwhite	19-CMP	2008	0.508	0.043	(0.428-0.602)	0.582	0.041	(0.505-0.669)	0.074	14.54%	(-0.042-0.191)
Northern Bobwhite	19-CMP	2009	0.663	0.061	(0.551-0.796)	0.659	0.076	(0.523-0.830)	-0.003	-0.50%	(-0.195-0.188)
Northern Bobwhite	19-CMP	2010	0.371	0.044	(0.293-0.469)	0.495	0.052	(0.401-0.611)	0.124	33.36%	(-0.009-0.257)
Northern Bobwhite	19-CMP	2011	0.222	0.027	(0.175-0.282)	0.182	0.024	(0.140-0.236)	-0.040	-18.14%	(-0.110-0.030)
Northern Bobwhite	22-ETP	2006	0.081	0.030	(0.040-0.162)	0.203	0.110	(0.074-0.549)	0.122	150.06%	(-0.101-0.345)
Northern Bobwhite	22-ETP	2007	0.056	0.010	(0.040-0.079)	0.212	0.053	(0.131-0.343)	0.156	275.79%	(0.051-0.261)
Northern Bobwhite	22-ETP	2008	0.080	0.023	(0.045-0.140)	0.237	0.051	(0.156-0.360)	0.158	197.77%	(0.048-0.267)
Northern Bobwhite	22-ETP	2009	0.130	0.029	(0.084-0.200)	0.350	0.063	(0.246-0.497)	0.220	168.71%	(0.084-0.356)
Northern Bobwhite	22-ETP	2010	0.087	0.020	(0.055-0.136)	0.204	0.039	(0.140-0.295)	0.116	132.71%	(0.031-0.202)
Northern Bobwhite	22-ETP	2011	0.035	0.007	(0.023-0.051)	0.145	0.032	(0.094-0.223)	0.111	320.25%	(0.046-0.175)
Northern Bobwhite	24-CH	2006	0.117	0.019	(0.084-0.161)	0.163	0.020	(0.127-0.208)	0.046	39.51%	(-0.007-0.100)
Northern Bobwhite	24-CH	2007	0.130	0.020	(0.095-0.176)	0.136	0.023	(0.097-0.190)	0.006	4.81%	(-0.053-0.066)
Northern Bobwhite	24-CH	2008	0.141	0.020	(0.106-0.188)	0.151	0.018	(0.118-0.192)	0.010	6.81%	(-0.044-0.063)
Northern Bobwhite	24-CH	2009	0.162	0.021	(0.125-0.209)	0.216	0.029	(0.165-0.282)	0.054	33.12%	(-0.016-0.124)
Northern Bobwhite	24-CH	2010	0.139	0.020	(0.103-0.185)	0.170	0.022	(0.131-0.220)	0.032	22.90%	(-0.026-0.090)
Northern Bobwhite	24-CH	2011	0.128	0.019	(0.094-0.172)	0.157	0.020	(0.121-0.204)	0.029	23.05%	(-0.025-0.085)
Northern Bobwhite	26-MAV	2006	0.051	0.016	(0.025-0.100)	0.300	0.100	(0.147-0.609)	0.249	492.06%	(0.050-0.448)
Northern Bobwhite	26-MAV	2007	0.021	0.005	(0.013-0.033)	0.146	0.032	(0.095-0.224)	0.125	592.51%	(0.062-0.188)
Northern Bobwhite	26-MAV	2008	0.015	0.004	(0.008-0.026)	0.149	0.030	(0.100-0.222)	0.134	872.68%	(0.074-0.193)
Northern Bobwhite	26-MAV	2009	0.021	0.005	(0.013-0.033)	0.078	0.019	(0.048-0.125)	0.057	265.69%	(0.019-0.095)
Northern Bobwhite	26-MAV	2010	0.014	0.003	(0.008-0.022)	0.106	0.023	(0.069-0.162)	0.092	656.98%	(0.047-0.137)
Northern Bobwhite	26-MAV	2011	0.011	0.004	(0.005-0.022)	0.042	0.015	(0.021-0.082)	0.031	281.35%	(0.002-0.060)
Northern Bobwhite	27-SCP	2006	0.077	0.008	(0.063-0.093)	0.127	0.012	(0.105-0.151)	0.050	64.33%	(0.022-0.077)
Northern Bobwhite	27-SCP	2007	0.079	0.007	(0.065-0.094)	0.100	0.009	(0.083-0.120)	0.021	26.86%	(-0.002-0.044)
Northern Bobwhite	27-SCP	2008	0.087	0.007	(0.074-0.103)	0.107	0.009	(0.090-0.127)	0.020	23.02%	(-0.002-0.043)
Northern Bobwhite	27-SCP	2009	0.080	0.008	(0.065-0.096)	0.116	0.010	(0.098-0.138)	0.037	45.85%	(0.012-0.061)
Northern Bobwhite	27-SCP	2010	0.071	0.008	(0.057-0.087)	0.090	0.009	(0.074-0.109)	0.019	27.25%	(-0.003-0.042)
Northern Bobwhite	27-SCP	2011	0.067	0.008	(0.053-0.083)	0.094	0.009	(0.076-0.114)	0.027	39.53%	(0.003-0.050)
Northern Bobwhite	Overall	2006	0.107	0.007	(0.101-0.129)	0.220	0.014	(0.193-0.250)	0.113	105.18%	(0.082-0.144)
Northern Bobwhite	Overall	2007	0.107	0.006	(0.096-0.119)	0.204	0.014	(0.178-0.232)	0.096	89.50%	(0.067-0.125)
Northern Bobwhite	Overall	2008	0.114	0.006	(0.103-0.126)	0.211	0.013	(0.187-0.238)	0.097	85.06%	(0.070-0.125)
Northern Bobwhite	Overall	2009	0.112	0.006	(0.100-0.125)	0.230	0.015	(0.201-0.262)	0.117	104.37%	(0.085-0.150)
Northern Bobwhite	Overall	2010	0.082	0.005	(0.072-0.092)	0.172	0.012	(0.150-0.196)	0.090	109.00%	(0.065-0.114)
Northern Bobwhite	Overall	2011	0.064	0.004	(0.056-0.073)	0.131	0.009	(0.113-0.151)	0.066	102.81%	(0.046-0.087)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011.

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Northern Bobwhite	Arkansas	2007	0.026	0.008	(0.014-0.048)	0.046	0.011	(0.028-0.075)	0.020	75.84%	(-0.007-0.047)
		2008	0.016	0.005	(0.008-0.031)	0.045	0.011	(0.027-0.074)	0.029	175.40%	(0.005-0.053)
		2009	0.033	0.009	(0.019-0.058)	0.039	0.013	(0.019-0.077)	0.006	17.07%	(-0.026-0.038)
		2010	0.025	0.008	(0.013-0.048)	0.044	0.013	(0.025-0.078)	0.019	74.90%	(-0.010-0.049)
		2011	0.014	0.007	(0.005-0.037)	0.011	0.007	(0.003-0.037)	-0.003	-20.75%	(-0.022-0.017)
	Georgia	2006	0.064	0.012	(0.044-0.092)	0.100	0.015	(0.072-0.136)	0.035	54.80%	(-0.002-0.073)
		2007	0.043	0.009	(0.027-0.065)	0.076	0.013	(0.054-0.105)	0.033	77.50%	(0.002-0.064)
		2008	0.067	0.010	(0.049-0.089)	0.121	0.015	(0.094-0.156)	0.055	82.21%	(0.019-0.090)
		2009	0.063	0.009	(0.047-0.083)	0.117	0.015	(0.089-0.153)	0.054	85.75%	(0.019-0.089)
		2010	0.068	0.012	(0.048-0.096)	0.103	0.014	(0.078-0.135)	0.034	50.40%	(-0.000-0.070)
		2011	0.064	0.013	(0.042-0.095)	0.092	0.013	(0.068-0.123)	0.028	43.70%	(-0.008-0.064)
	Illinois	2006	0.347	0.078	(0.221-0.542)	0.868	0.174	(0.583-1.289)	0.521	149.99%	(0.147-0.894)
		2007	0.322	0.061	(0.219-0.470)	0.960	0.192	(0.646-1.424)	0.638	198.38%	(0.243-1.033)
		2008	0.267	0.053	(0.179-0.397)	0.837	0.166	(0.565-1.239)	0.571	213.80%	(0.229-0.912)
		2009	0.265	0.080	(0.144-0.487)	1.029	0.228	(0.660-1.602)	0.763	288.01%	(0.289-1.238)
		2010	0.186	0.045	(0.114-0.302)	0.761	0.140	(0.527-1.098)	0.575	309.41%	(0.286-0.864)
		2011	0.106	0.033	(0.057-0.196)	0.632	0.127	(0.424-0.941)	0.526	495.67%	(0.269-0.782)
	Indiana	2006	0.099	0.023	(0.062-0.155)	0.306	0.080	(0.184-0.508)	0.208	210.49%	(0.045-0.370)
		2007	0.084	0.019	(0.053-0.130)	0.358	0.118	(0.188-0.681)	0.275	328.38%	(0.040-0.510)
		2008	0.080	0.018	(0.051-0.125)	0.261	0.068	(0.156-0.435)	0.181	225.24%	(0.042-0.319)
		2009	0.080	0.016	(0.054-0.119)	0.355	0.092	(0.213-0.588)	0.274	340.65%	(0.091-0.458)
		2010	0.074	0.017	(0.046-0.117)	0.241	0.065	(0.142-0.408)	0.167	225.72%	(0.035-0.299)
		2011	0.054	0.017	(0.028-0.098)	0.218	0.062	(0.125-0.379)	0.164	306.38%	(0.038-0.290)
	Iowa	2006	0.014	0.005	(0.007-0.027)	0.024	0.006	(0.014-0.040)	0.009	65.00%	(-0.005-0.024)
		2007	0.015	0.005	(0.007-0.030)	0.023	0.007	(0.012-0.042)	0.009	57.90%	(-0.008-0.026)
		2008	0.008	0.004	(0.003-0.019)	0.003	0.002	(0.000-0.011)	-0.005	-66.67%	(-0.013-0.003)
		2009	0.013	0.005	(0.006-0.025)	0.013	0.005	(0.005-0.028)	0.000	1.89%	(-0.013-0.014)
		2010	0.006	0.003	(0.002-0.017)	0.005	0.003	(0.001-0.017)	-0.001	-12.50%	(-0.010-0.009)
		2011	0.003	0.002	(0.000-0.010)	0.014	0.005	(0.006-0.029)	0.012	466.67%	(0.001-0.023)
	Kentucky	2006	0.117	0.038	(0.061-0.220)	0.171	0.043	(0.105-0.278)	0.055	46.88%	(-0.058-0.167)
		2007	0.292	0.098	(0.153-0.557)	0.332	0.091	(0.194-0.566)	0.039	13.47%	(-0.222-0.302)
		2008	0.139	0.036	(0.084-0.230)	0.194	0.054	(0.112-0.333)	0.055	39.33%	(-0.073-0.183)
		2009	0.088	0.034	(0.042-0.183)	0.131	0.030	(0.083-0.204)	0.043	48.27%	(-0.046-0.131)
		2010	0.110	0.025	(0.070-0.172)	0.055	0.017	(0.030-0.099)	-0.056	-50.44%	(-0.115-0.004)
		2011	0.062	0.018	(0.034-0.109)	0.234	0.130	(0.084-0.651)	0.173	279.18%	(-0.085-0.431)

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BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Northern Bobwhite	Mississippi	2006	0.030	0.007	(0.019-0.046)	0.213	0.017	(0.182-0.249)	0.183	605.41%	(0.148-0.218)
		2007	0.024	0.005	(0.015-0.037)	0.142	0.010	(0.123-0.164)	0.118	488.24%	(0.095-0.141)
		2008	0.021	0.005	(0.013-0.032)	0.162	0.011	(0.140-0.186)	0.140	659.17%	(0.116-0.164)
		2009	0.013	0.003	(0.008-0.020)	0.085	0.005	(0.075-0.096)	0.072	536.07%	(0.060-0.084)
		2010	0.004	0.001	(0.002-0.006)	0.129	0.008	(0.113-0.147)	0.125	2965.29%	(0.108-0.141)
		2011	0.008	0.002	(0.005-0.013)	0.048	0.003	(0.042-0.054)	0.039	464.35%	(0.033-0.046)
	Missouri	2006	0.109	0.010	(0.091-0.130)	0.098	0.008	(0.082-0.116)	-0.012	-10.65%	(-0.036-0.014)
		2007	0.085	0.009	(0.067-0.105)	0.079	0.009	(0.062-0.101)	-0.005	-6.31%	(-0.031-0.021)
		2008	0.100	0.011	(0.081-0.124)	0.085	0.009	(0.067-0.106)	-0.016	-15.88%	(-0.044-0.012)
		2009	0.075	0.008	(0.059-0.093)	0.069	0.008	(0.054-0.086)	-0.007	-8.69%	(-0.029-0.016)
		2010	0.066	0.009	(0.050-0.087)	0.074	0.011	(0.055-0.100)	0.008	11.92%	(-0.020-0.036)
		2011	0.046	0.006	(0.035-0.059)	0.039	0.006	(0.028-0.053)	-0.008	-16.58%	(-0.024-0.009)
	Nebraska	2007	0.114	0.026	(0.072-0.179)	1.111	0.343	(0.613-2.014)	0.997	874.39%	(0.323-1.671)
		2008	0.140	0.030	(0.090-0.215)	1.620	0.435	(0.963-2.724)	1.480	1057.18%	(0.625-2.336)
		2009	0.088	0.021	(0.054-0.140)	1.103	0.329	(0.620-1.960)	1.015	1155.47%	(0.369-1.660)
		2010	0.052	0.011	(0.034-0.079)	0.530	0.174	(0.281-0.998)	0.478	919.59%	(0.136-0.820)
		2011	0.070	0.012	(0.050-0.098)	0.292	0.090	(0.160-0.530)	0.221	315.46%	(0.043-0.400)
	North Carolina	2007	0.070	0.011	(0.050-0.095)	0.067	0.014	(0.044-0.102)	-0.002	-3.45%	(-0.037-0.033)
		2008	0.094	0.014	(0.070-0.125)	0.084	0.014	(0.060-0.117)	-0.010	-10.62%	(-0.048-0.028)
		2009	0.059	0.010	(0.042-0.081)	0.060	0.011	(0.040-0.088)	0.001	1.56%	(-0.028-0.030)
		2010	0.062	0.012	(0.041-0.092)	0.038	0.006	(0.027-0.054)	-0.024	-38.18%	(-0.050-0.004)
		2011	0.047	0.009	(0.032-0.068)	0.049	0.012	(0.030-0.079)	0.002	4.57%	(-0.026-0.031)
	Ohio	2006	0.050	0.013	(0.030-0.082)	0.043	0.013	(0.023-0.077)	-0.007	-14.94%	(-0.043-0.028)
		2007	0.027	0.009	(0.013-0.053)	0.026	0.008	(0.014-0.046)	-0.001	-3.75%	(-0.024-0.023)
		2008	0.037	0.011	(0.021-0.066)	0.017	0.005	(0.009-0.032)	-0.020	-54.06%	(-0.043-0.004)
		2009	0.023	0.008	(0.012-0.044)	0.043	0.014	(0.022-0.082)	0.020	85.22%	(-0.011-0.051)
		2010	0.018	0.006	(0.008-0.036)	0.014	0.006	(0.006-0.033)	-0.004	-20.82%	(-0.021-0.014)
		2011	0.012	0.005	(0.005-0.025)	0.016	0.006	(0.007-0.034)	0.004	35.71%	(-0.010-0.019)
	South Carolina	2006	0.095	0.018	(0.064-0.139)	0.267	0.066	(0.165-0.432)	0.172	180.41%	(0.038-0.306)
		2007	0.097	0.024	(0.059-0.159)	0.226	0.064	(0.130-0.391)	0.129	132.22%	(-0.005-0.263)
		2008	0.083	0.019	(0.052-0.130)	0.129	0.038	(0.073-0.229)	0.047	56.67%	(-0.036-0.130)
		2009	0.058	0.012	(0.037-0.087)	0.111	0.030	(0.066-0.186)	0.053	92.71%	(-0.009-0.116)
		2010	0.054	0.014	(0.032-0.088)	0.096	0.029	(0.053-0.172)	0.042	77.90%	(-0.020-0.104)
		2011	0.083	0.016	(0.056-0.122)	0.163	0.041	(0.100-0.265)	0.080	95.64%	(-0.005-0.165)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Northern Bobwhite	Tennessee	2006	0.047	0.011	(0.029-0.074)	0.244	0.094	(0.116-0.508)	0.197	422.26%	(0.011-0.383)
		2007	0.056	0.015	(0.033-0.095)	0.252	0.107	(0.112-0.562)	0.196	348.01%	(-0.015-0.407)
		2008	0.032	0.008	(0.019-0.052)	0.157	0.063	(0.073-0.335)	0.125	389.52%	(0.001-0.249)
		2009	0.046	0.016	(0.022-0.091)	0.234	0.097	(0.106-0.511)	0.188	411.95%	(-0.004-0.380)
		2010	0.028	0.010	(0.013-0.057)	0.091	0.037	(0.041-0.197)	0.063	223.88%	(-0.013-0.138)
		2011	0.044	0.015	(0.021-0.088)	0.123	0.054	(0.053-0.281)	0.079	181.07%	(-0.030-0.189)
	Texas	2006	0.795	0.144	(0.558-1.132)	0.668	0.078	(0.530-0.842)	-0.127	-15.99%	(-0.447-0.193)
		2007	0.335	0.042	(0.263-0.427)	0.432	0.052	(0.340-0.548)	0.096	28.72%	(-0.034-0.227)
		2008	0.263	0.036	(0.201-0.342)	0.403	0.047	(0.321-0.506)	0.140	53.50%	(0.026-0.255)
		2009	0.485	0.054	(0.388-0.606)	0.469	0.068	(0.350-0.627)	-0.016	-3.36%	(-0.187-0.155)
		2010	1.445	0.263	(1.012-2.063)	1.977	0.309	(1.455-2.685)	0.532	36.80%	(-0.263-1.327)
		2011	0.342	0.095	(0.199-0.584)	0.189	0.054	(0.108-0.329)	-0.153	-44.67%	(-0.366-0.061)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Dickcissel	19-CMP	2006	0.216	0.053	(0.131-0.354)	0.216	0.073	(0.111-0.419)	0.000	-0.06%	(-0.176-0.177)
		2007	0.524	0.088	(0.374-0.731)	1.431	0.210	(1.071-1.912)	0.908	173.31%	(0.462-1.353)
		2008	0.239	0.052	(0.154-0.368)	0.702	0.137	(0.477-1.032)	0.463	194.18%	(0.176-0.751)
		2009	0.270	0.118	(0.117-0.622)	0.394	0.160	(0.179-0.862)	0.124	45.84%	(-0.265-0.513)
		2010	0.544	0.116	(0.356-0.830)	0.756	0.171	(0.484-1.180)	0.212	38.97%	(-0.192-0.617)
		2011	0.388	0.117	(0.214-0.700)	0.746	0.187	(0.454-1.224)	0.359	92.55%	(-0.073-0.791)
	22-ETP	2006	0.227	0.030	(0.174-0.295)	0.394	0.056	(0.297-0.521)	0.167	73.67%	(0.041-0.293)
		2007	0.333	0.043	(0.258-0.428)	0.477	0.067	(0.362-0.627)	0.145	43.45%	(-0.011-0.300)
		2008	0.450	0.051	(0.360-0.560)	0.815	0.108	(0.627-1.057)	0.365	81.21%	(0.131-0.5995)
		2009	0.451	0.062	(0.343-0.591)	0.867	0.129	(0.647-1.160)	0.416	92.22%	(0.135-0.697)
		2010	0.523	0.071	(0.401-0.682)	0.862	0.118	(0.659-1.126)	0.338	64.63%	(0.069-0.607)
		2011	0.393	0.045	(0.314-0.492)	0.617	0.080	(0.478-0.794)	0.223	56.70%	(0.044-0.403)
	24-CH	2006	0.304	0.085	(0.176-0.524)	0.524	0.133	(0.317-0.864)	0.219	72.15%	(-0.090-0.529)
		2007	0.328	0.094	(0.187-0.572)	0.740	0.147	(0.500-1.093)	0.412	125.72%	(0.071-0.753)
		2008	0.580	0.141	(0.361-0.932)	0.891	0.167	(0.615-1.289)	0.311	53.58%	(-0.117-0.739)
		2009	0.457	0.126	(0.268-0.780)	0.652	0.131	(0.439-0.969)	0.195	42.62%	(-0.160-0.551)
		2010	0.457	0.124	(0.269-0.773)	0.743	0.170	(0.472-1.167)	0.286	62.67%	(-0.126-0.699)
		2011	0.614	0.145	(0.387-0.971)	0.848	0.146	(0.602-1.192)	0.234	38.12%	(-0.169-0.637)
	26-MAV	2006	0.827	0.286	(0.395-1.730)	2.647	1.043	(1.152-6.080)	1.820	220.12%	(-0.299-3.940)
		2007	0.834	0.138	(0.599-1.160)	3.057	0.459	(2.268-4.119)	2.223	266.59%	(1.283-3.163)
		2008	1.239	0.165	(0.950-1.614)	4.003	0.478	(3.16-5.070)	2.764	223.14%	(1.774-3.754)
		2009	0.969	0.163	(0.692-1.354)	4.494	0.542	(3.538-5.705)	3.525	363.87%	(2.416-4.634)
		2010	1.029	0.165	(0.747-1.416)	5.239	0.607	(4.164-6.591)	4.211	409.22%	(2.977-5.444)
		2011	0.525	0.084	(0.381-0.722)	3.608	0.389	(2.914-4.467)	3.083	586.76%	(2.303-3.863)
	27-SCP	2006	0.141	0.038	(0.083-0.240)	0.236	0.071	(0.130-0.424)	0.094	66.67%	(-0.064-0.253)
		2007	0.101	0.030	(0.056-0.181)	0.184	0.054	(0.103-0.326)	0.083	82.47%	(-0.037-0.204)
		2008	0.119	0.036	(0.065-0.215)	0.192	0.052	(0.113-0.325)	0.074	62.33%	(-0.049-0.198)
		2009	0.168	0.043	(0.102-0.277)	0.207	0.055	(0.123-0.347)	0.039	23.08%	(-0.097-0.175)
		2010	0.102	0.034	(0.053-0.193)	0.221	0.060	(0.129-0.376)	0.119	116.77%	(-0.016-0.254)
		2011	0.197	0.037	(0.135-0.287)	0.256	0.057	(0.164-0.398)	0.059	29.93%	(-0.075-0.193)
	Overall	2006	0.248	0.024	(0.204-0.300)	0.459	0.049	(0.372-0.565)	0.211	85.37%	(0.104-0.319)
		2007	0.376	0.031	(0.319-0.442)	0.827	0.061	(0.715-0.956)	0.451	119.92%	(0.317-0.586)
		2008	0.452	0.036	(0.387-0.527)	0.925	0.068	(0.800-1.068)	0.473	104.51%	(0.322-0.623)
		2009	0.449	0.042	(0.374-0.538)	0.947	0.078	(0.804-1.113)	0.497	110.64%	(0.323-0.671)
		2010	0.514	0.044	(0.435-0.607)	1.115	0.083	(0.962-1.290)	0.600	116.77%	(0.416-0.785)
		2011	0.427	0.033	(0.366-0.496)	0.907	0.061	(0.793-1.035)	0.480	112.44%	(0.343-0.616)

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BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Dickcissel	Arkansas	2007	1.062	0.175	(0.762-1.479)	3.768	0.472	(2.936-4.835)	2.706	254.67%	(1.719-3.692)
		2008	1.823	0.210	(1.445-2.298)	5.005	0.598	(3.946-6.347)	3.182	174.57%	(1.940-4.424)
		2009	1.486	0.225	(1.096-2.014)	5.899	0.608	(4.808-7.235)	4.412	296.89%	(3.141-5.684)
		2010	1.371	0.211	(1.005-1.868)	6.953	0.651	(5.778-8.366)	5.582	407.13%	(4.241-6.923)
		2011	0.678	0.112	(0.485-0.946)	4.077	0.428	(3.311-5.018)	3.399	501.41%	(2.533-4.265)
	Illinois	2006	0.368	0.128	(0.186-0.725)	1.229	0.286	(0.774-1.949)	0.860	233.75%	(0.247-1.474)
		2007	0.610	0.234	(0.290-1.284)	1.010	0.292	(0.571-1.785)	0.399	65.39%	(-0.333-1.132)
		2008	0.718	0.226	(0.386-1.331)	1.960	0.524	(1.155-3.325)	1.242	173.04%	(0.123-2.361)
		2009	0.941	0.495	(0.342-2.587)	2.007	0.825	(0.893-4.508)	1.066	113.22%	(-0.820-2.952)
		2010	1.244	0.463	(0.598-2.584)	2.359	0.619	(1.396-3.985)	1.115	89.65%	(-0.400-2.631)
		2011	0.577	0.193	(0.297-1.118)	1.110	0.272	(0.680-1.808)	0.533	92.31%	(-0.120-1.186)
	Indiana	2006	0.126	0.051	(0.057-0.275)	0.377	0.143	(0.180-0.788)	0.251	199.63%	(-0.046-0.550)
		2007	0.028	0.014	(0.010-0.073)	0.271	0.149	(0.095-0.766)	0.243	858.45%	(-0.051-0.536)
		2008	0.042	0.025	(0.014-0.126)	0.308	0.125	(0.140-0.675)	0.266	627.13%	(0.016-0.515)
		2009	0.129	0.086	(0.038-0.435)	0.399	0.144	(0.197-0.806)	0.270	209.19%	(-0.058-0.599)
		2010	0.103	0.047	(0.042-0.246)	0.257	0.108	(0.113-0.581)	0.155	150.56%	(-0.076-0.386)
		2011	0.048	0.025	(0.017-0.128)	0.233	0.112	(0.093-0.583)	0.185	385.36%	(-0.038-0.409)
	Iowa	2006	0.143	0.027	(0.098-0.209)	0.491	0.112	(0.314-0.766)	0.348	242.87%	(0.123-0.573)
		2007	0.124	0.028	(0.079-0.193)	0.520	0.114	(0.337-0.799)	0.396	319.99%	(0.166-0.626)
		2008	0.097	0.024	(0.058-0.159)	0.438	0.109	(0.267-0.715)	0.341	352.56%	(0.121-0.561)
		2009	0.127	0.026	(0.084-0.191)	0.580	0.133	(0.369-0.908)	0.452	355.21%	(0.187-0.718)
		2010	0.125	0.030	(0.076-0.202)	0.489	0.119	(0.303-0.789)	0.365	292.75%	(0.124-0.606)
		2011	0.161	0.034	(0.105-0.245)	0.619	0.147	(0.388-0.986)	0.458	284.90%	(0.162-0.754)
	Kentucky	2006	0.203	0.061	(0.113-0.364)	0.306	0.094	(0.166-0.560)	0.102	50.24%	(-0.117-0.322)
		2007	0.133	0.051	(0.063-0.279)	0.318	0.100	(0.170-0.593)	0.185	138.72%	(-0.035-0.406)
		2008	0.270	0.077	(0.154-0.472)	0.306	0.077	(0.185-0.504)	0.036	13.33%	(-0.177-0.250)
		2009	0.321	0.111	(0.163-0.629)	0.294	0.088	(0.162-0.532)	-0.026	-8.17%	(-0.304-0.252)
		2010	0.291	0.095	(0.153-0.551)	0.224	0.082	(0.109-0.458)	-0.067	-23.11%	(-0.313-0.179)
		2011	0.408	0.112	(0.238-0.697)	0.520	0.113	(0.337-0.803)	0.112	27.52%	(-0.199-0.424)
	Mississippi	2006	0.240	0.021	(0.201-0.286)	0.692	0.071	(0.564-0.849)	0.452	188.34%	(0.307-0.597)
		2007	0.198	0.017	(0.167-0.235)	0.521	0.046	(0.436-0.620)	0.322	162.32%	(0.226-0.418)
		2008	0.102	0.007	(0.089-0.117)	0.565	0.038	(0.493-0.646)	0.463	451.63%	(0.386-0.539)
		2009	0.100	0.007	(0.087-0.115)	0.426	0.029	(0.371-0.487)	0.325	323.71%	(0.267-0.384)
		2010	0.089	0.006	(0.077-0.102)	0.471	0.034	(0.408-0.543)	0.382	428.06%	(0.314-0.449)
		2011	0.158	0.011	(0.137-0.182)	0.429	0.028	(0.376-0.488)	0.271	171.26%	(0.211-0.330)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Dickcissel	Missouri	2006	0.408	0.105	(0.247-0.673)	0.395	0.100	(0.241-0.645)	-0.013	-3.23%	(-0.296-0.271)
		2007	0.817	0.136	(0.589-1.131)	0.892	0.186	(0.594-1.339)	0.075	9.21%	(-0.375-0.526)
		2008	0.927	0.155	(0.668-1.286)	1.992	0.369	(1.387-2.859)	1.065	114.81%	(0.280-1.850)
		2009	1.139	0.284	(0.701-1.847)	1.856	0.388	(1.234-2.788)	0.717	62.98%	(-0.225-1.660)
		2010	1.002	0.170	(0.717-1.399)	1.735	0.318	(1.212-2.483)	0.733	73.10%	(0.026-1.440)
		2011	0.854	0.132	(0.631-1.155)	1.093	0.163	(0.815-1.465)	0.239	27.95%	(-0.171-0.649)
	Nebraska	2007	1.134	0.211	(0.780-1.647)	2.550	0.361	(1.920-3.386)	1.417	124.95%	(0.597-2.236)
		2008	0.912	0.156	(0.646-1.286)	2.150	0.263	(1.679-2.752)	1.238	135.71%	(0.638-1.838)
		2009	1.049	0.174	(0.752-1.462)	2.231	0.339	(1.645-3.025)	1.182	112.73%	(0.436-1.929)
		2010	1.772	0.215	(1.387-2.262)	2.022	0.258	(1.565-2.612)	0.250	14.12%	(-0.408-0.909)
		2011	1.896	0.221	(1.499-2.395)	2.450	0.239	(2.014-2.979)	0.554	29.23%	(-0.082-1.191)
	Tennessee	2006	0.170	0.071	(0.075-0.380)	0.090	0.041	(0.038-0.214)	-0.079	-46.67%	(-0.238-0.081)
		2007	0.069	0.049	(0.018-0.260)	0.036	0.019	(0.013-0.100)	-0.033	-47.78%	(-0.137-0.071)
		2008	0.070	0.041	(0.023-0.208)	0.021	0.016	(0.005-0.080)	-0.050	-70.38%	(-0.135-0.036)
		2009	0.141	0.058	(0.062-0.313)	0.038	0.015	(0.017-0.083)	-0.103	-73.13%	(-0.220-0.015)
		2010	0.070	0.052	(0.018-0.268)	0.036	0.014	(0.017-0.077)	-0.033	-47.56%	(-0.138-0.073)
		2011	0.124	0.079	(0.037-0.410)	0.066	0.035	(0.024-0.181)	-0.057	-46.47%	(-0.226-0.112)
	Texas	2006	0.197	0.049	(0.120-0.324)	0.164	0.055	(0.084-0.315)	-0.034	-17.15%	(-0.177-0.110)
		2007	0.438	0.083	(0.299-0.640)	0.897	0.134	(0.665-1.210)	0.459	104.86%	(0.150-0.769)
		2008	0.148	0.033	(0.094-0.232)	0.340	0.069	(0.227-0.510)	0.192	129.41%	(0.042-0.342)
		2009	0.176	0.127	(0.047-0.649)	0.033	0.018	(0.011-0.093)	-0.142	-80.95%	(-0.392-0.108)
		2010	0.046	0.031	(0.013-0.156)	0.079	0.042	(0.028-0.215)	0.032	69.17%	(-0.069-0.133)
		2011	0.014	0.010	(0.003-0.053)	0.014	0.010	(0.003-0.053)	0.000	0.00%	(-0.028-0.029)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Field Sparrow	22-ETP	2006	0.221	0.022	(0.182-0.268)	0.562	0.040	(0.489-0.646)	0.341	154.04%	(0.252-0.430)
		2007	0.190	0.018	(0.157-0.228)	0.550	0.040	(0.476-0.634)	0.360	190.00%	(0.274-0.446)
		2008	0.153	0.021	(0.117-0.199)	0.550	0.047	(0.464-0.649)	0.397	259.29%	(0.296-0.497)
		2009	0.206	0.021	(0.168-0.251)	0.609	0.046	(0.524-0.707)	0.403	196.04%	(0.304-0.503)
		2010	0.190	0.018	(0.157-0.229)	0.566	0.045	(0.483-0.662)	0.376	198.33%	(0.280-0.472)
		2011	0.153	0.017	(0.123-0.190)	0.457	0.046	(0.375-0.556)	0.304	198.20%	(0.208-0.399)
	24-CH	2006	0.226	0.040	(0.159-0.319)	0.398	0.059	(0.296-0.533)	0.172	76.09%	(0.032-0.312)
		2007	0.256	0.043	(0.184-0.355)	0.493	0.060	(0.387-0.626)	0.237	92.73%	(0.093-0.381)
		2008	0.307	0.064	(0.203-0.461)	0.392	0.051	(0.303-0.507)	0.085	27.81%	(-0.075-0.246)
		2009	0.201	0.037	(0.139-0.289)	0.326	0.048	(0.244-0.435)	0.125	62.36%	(0.006-0.244)
		2010	0.213	0.043	(0.143-0.317)	0.405	0.060	(0.301-0.542)	0.191	89.76%	(0.047-0.336)
		2011	0.138	0.028	(0.092-0.206)	0.304	0.049	(0.220-0.418)	0.166	119.74%	(0.055-0.277)
	27-SCP	2006	0.443	0.156	(0.225-0.868)	0.485	0.078	(0.354-0.663)	0.042	9.56%	(-0.299-0.384)
		2007	0.162	0.038	(0.102-0.255)	0.386	0.084	(0.253-0.589)	0.224	138.48%	(0.043-0.405)
		2008	0.147	0.037	(0.090-0.238)	0.249	0.029	(0.198-0.312)	0.102	69.38%	(0.011-0.193)
		2009	0.154	0.097	(0.049-0.478)	0.170	0.019	(0.136-0.212)	0.016	10.37%	(-0.176-0.209)
		2010	0.070	0.011	(0.051-0.095)	0.214	0.034	(0.156-0.292)	0.144	206.34%	(0.074-0.214)
		2011	0.181	0.040	(0.118-0.277)	0.276	0.040	(0.208-0.366)	0.095	52.46%	(-0.015-0.205)
	Overall	2006	0.252	0.017	(0.220-0.288)	0.400	0.021	(0.359-0.443)	0.147	58.31%	(0.093-0.201)
		2007	0.220	0.014	(0.193-0.249)	0.380	0.019	(0.344-0.418)	0.160	72.88%	(0.114-0.206)
		2008	0.190	0.014	(0.164-0.219)	0.380	0.020	(0.341-0.421)	0.189	99.39%	(0.141-0.238)
		2009	0.178	0.013	(0.154-0.205)	0.367	0.021	(0.328-0.410)	0.189	106.12%	(0.141-0.237)
		2010	0.185	0.013	(0.161-0.211)	0.372	0.019	(0.336-0.411)	0.187	101.10%	(0.142-0.232)
		2011	0.177	0.014	(0.152-0.205)	0.355	0.021	(0.317-0.398)	0.178	100.79%	(0.130-0.227)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Field Sparrow	Georgia	2006	0.210	0.044	(0.138-0.318)	0.242	0.048	(0.161-0.361)	0.032	15.39%	(-0.095-0.160)
		2007	0.140	0.040	(0.079-0.245)	0.266	0.041	(0.194-0.362)	0.126	89.81%	(0.014-0.238)
		2008	0.105	0.030	(0.059-0.185)	0.276	0.043	(0.201-0.377)	0.171	162.62%	(0.068-0.274)
		2009	0.061	0.014	(0.038-0.094)	0.316	0.040	(0.245-0.406)	0.255	422.00%	(0.173-0.338)
		2010	0.138	0.024	(0.096-0.196)	0.313	0.035	(0.251-0.390)	0.175	126.91%	(0.092-0.258)
		2011	0.174	0.032	(0.120-0.252)	0.400	0.040	(0.328-0.487)	0.226	129.64%	(0.126-0.326)
	Illinois	2006	0.195	0.066	(0.100-0.377)	0.753	0.158	(0.496-1.141)	0.558	287.04%	(0.223-0.893)
		2007	0.283	0.080	(0.162-0.493)	0.990	0.190	(0.676-1.448)	0.706	249.40%	(0.302-1.111)
		2008	0.330	0.111	(0.170-0.637)	1.064	0.201	(0.730-1.550)	0.734	222.58%	(0.283-1.186)
		2009	0.398	0.103	(0.238-0.664)	1.222	0.259	(0.797-1.871)	0.823	206.82%	(0.276-1.370)
		2010	0.303	0.070	(0.191-0.479)	1.009	0.245	(0.621-1.640)	0.706	232.69%	(0.207-1.205)
		2011	0.214	0.067	(0.114-0.398)	0.985	0.267	(0.573-1.691)	0.771	360.18%	(0.231-1.311)
	Indiana	2006	0.280	0.065	(0.176-0.442)	0.635	0.133	(0.419-0.960)	0.355	127.00%	(0.065-0.645)
		2007	0.375	0.082	(0.244-0.575)	0.977	0.156	(0.712-1.341)	0.602	160.40%	(0.257-0.948)
		2008	0.232	0.067	(0.132-0.408)	0.826	0.159	(0.564-1.209)	0.594	255.67%	(0.257-0.931)
		2009	0.332	0.076	(0.211-0.521)	0.876	0.159	(0.611-1.254)	0.543	163.42%	(0.198-0.889)
		2010	0.440	0.107	(0.272-0.709)	0.797	0.144	(0.556-1.139)	0.357	81.23%	(0.006-0.708)
		2011	0.412	0.094	(0.263-0.644)	0.910	0.170	(0.628-1.318)	0.498	120.74%	(0.117-0.879)
	Iowa	2006	0.028	0.009	(0.014-0.053)	0.058	0.011	(0.039-0.085)	0.030	106.67%	(0.002-0.058)
		2007	0.014	0.005	(0.006-0.030)	0.064	0.013	(0.042-0.094)	0.049	342.84%	(0.022-0.076)
		2008	0.016	0.007	(0.006-0.036)	0.059	0.017	(0.033-0.104)	0.043	271.43%	(0.007-0.078)
		2009	0.020	0.006	(0.010-0.036)	0.054	0.012	(0.035-0.083)	0.034	171.70%	(0.008-0.060)
		2010	0.016	0.006	(0.007-0.032)	0.088	0.021	(0.055-0.140)	0.073	462.50%	(0.031-0.114)
		2011	0.035	0.009	(0.020-0.059)	0.053	0.014	(0.031-0.089)	0.018	50.00%	(-0.015-0.050)
	Kentucky	2006	0.248	0.041	(0.178-0.344)	0.453	0.068	(0.336-0.609)	0.205	82.66%	(0.050-0.360)
		2007	0.387	0.068	(0.273-0.549)	0.547	0.076	(0.415-0.720)	0.160	41.26%	(-0.039-0.359)
		2008	0.303	0.047	(0.222-0.413)	0.504	0.068	(0.385-0.657)	0.201	66.23%	(0.039-0.363)
		2009	0.233	0.041	(0.163-0.331)	0.478	0.072	(0.354-0.644)	0.246	105.54%	(0.083-0.408)
		2010	0.174	0.043	(0.106-0.284)	0.452	0.071	(0.330-0.616)	0.278	159.65%	(0.115-0.440)
		2011	0.400	0.084	(0.263-0.607)	0.597	0.102	(0.425-0.837)	0.197	49.38%	(-0.061-0.456)
	Missouri	2006	0.104	0.022	(0.068-0.158)	0.201	0.023	(0.159-0.253)	0.096	92.32%	(0.034-0.159)
		2007	0.132	0.021	(0.096-0.179)	0.175	0.023	(0.134-0.227)	0.043	32.86%	(-0.017-0.104)
		2008	0.158	0.029	(0.110-0.227)	0.224	0.032	(0.168-0.298)	0.066	41.70%	(-0.018-0.151)
		2009	0.144	0.026	(0.100-0.207)	0.236	0.026	(0.189-0.294)	0.092	63.82%	(0.019-0.165)
		2010	0.206	0.033	(0.149-0.282)	0.320	0.040	(0.249-0.410)	0.115	55.71%	(0.013-0.216)
		2011	0.110	0.020	(0.076-0.157)	0.157	0.023	(0.117-0.209)	0.047	43.16%	(-0.012-0.107)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Field Sparrow	Nebraska	2007	0.286	0.123	(0.125-0.653)	0.817	0.254	(0.445-1.500)	0.531	185.71%	(-0.021-1.084)
		2008	0.238	0.082	(0.122-0.465)	1.073	0.317	(0.600-1.915)	0.834	350.02%	(0.194-1.475)
		2009	0.140	0.078	(0.048-0.398)	0.611	0.219	(0.304-1.225)	0.471	337.48%	(0.016-0.926)
		2010	0.107	0.048	(0.045-0.255)	0.479	0.111	(0.303-0.754)	0.371	346.26%	(0.134-0.609)
		2011	0.209	0.082	(0.098-0.446)	0.484	0.136	(0.279-0.838)	0.274	131.22%	(-0.035-0.585)
	North Carolina	2007	0.052	0.018	(0.027-0.100)	0.127	0.027	(0.083-0.193)	0.074	141.65%	(0.011-0.137)
		2008	0.050	0.018	(0.025-0.100)	0.114	0.027	(0.071-0.181)	0.064	127.60%	(0.001-0.127)
		2009	0.022	0.009	(0.009-0.048)	0.030	0.011	(0.014-0.062)	0.008	37.75%	(-0.020-0.036)
		2010	0.045	0.016	(0.021-0.090)	0.093	0.023	(0.056-0.152)	0.048	107.85%	(-0.007-0.104)
		2011	0.045	0.015	(0.024-0.084)	0.127	0.029	(0.080-0.201)	0.082	180.69%	(0.017-0.146)
	Ohio	2006	0.473	0.072	(0.350-0.639)	0.695	0.083	(0.549-0.878)	0.221	46.80%	(0.006-0.436)
		2007	0.323	0.053	(0.233-0.446)	0.570	0.069	(0.448-0.723)	0.247	76.73%	(0.077-0.418)
		2008	0.230	0.065	(0.132-0.400)	0.521	0.077	(0.388-0.697)	0.291	126.31%	(0.094-0.488)
		2009	0.337	0.065	(0.230-0.492)	0.599	0.078	(0.463-0.774)	0.262	77.55%	(0.063-0.460)
		2010	0.306	0.045	(0.228-0.410)	0.446	0.048	(0.360-0.552)	0.140	45.60%	(0.010-0.269)
		2011	0.201	0.033	(0.145-0.278)	0.393	0.049	(0.307-0.504)	0.192	95.45%	(0.076-0.308)
	South Carolina	2006	0.039	0.026	(0.011-0.131)	0.110	0.037	(0.057-0.210)	0.070	180.00%	(-0.017-0.158)
		2007	0.055	0.023	(0.024-0.122)	0.204	0.050	(0.124-0.331)	0.149	271.43%	(0.040-0.257)
		2008	0.049	0.023	(0.020-0.119)	0.148	0.043	(0.083-0.263)	0.099	200.00%	(0.003-0.195)
		2009	0.009	0.006	(0.002-0.032)	0.009	0.006	(0.002-0.032)	0.000	1.43%	(-0.017-0.018)
		2010	0.009	0.006	(0.002-0.033)	0.083	0.038	(0.034-0.201)	0.074	799.34%	(-0.001-0.150)
		2011	0.019	0.011	(0.006-0.057)	0.106	0.046	(0.045-0.247)	0.088	466.15%	(-0.005-0.181)
	Tennessee	2006	0.480	0.107	(0.310-0.740)	0.526	0.074	(0.397-0.697)	0.047	9.73%	(-0.208-0.301)
		2007	0.413	0.109	(0.245-0.693)	0.571	0.089	(0.414-0.786)	0.158	38.39%	(-0.118-0.435)
		2008	0.420	0.104	(0.259-0.679)	0.615	0.080	(0.472-0.799)	0.195	46.42%	(-0.062-0.452)
		2009	0.512	0.118	(0.326-0.801)	0.654	0.102	(0.478-0.894)	0.142	27.73%	(-0.163-0.447)
		2010	0.346	0.085	(0.214-0.559)	0.545	0.082	(0.403-0.736)	0.199	57.31%	(-0.033-0.430)
		2011	0.207	0.076	(0.101-0.425)	0.407	0.089	(0.261-0.634)	0.200	96.29%	(-0.030-0.430)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Eastern Meadowlark	19-CMP	2006	0.261	0.056	(0.169-0.402)	0.210	0.043	(0.139-0.316)	-0.051	-19.53%	(-0.190-0.088)
		2007	0.187	0.043	(0.118-0.295)	0.189	0.039	(0.125-0.284)	0.002	0.89%	(-0.112-0.116)
		2008	0.208	0.031	(0.155-0.279)	0.200	0.030	(0.148-0.268)	-0.009	-4.10%	(-0.092-0.075)
		2009	0.207	0.034	(0.149-0.286)	0.188	0.044	(0.118-0.297)	-0.020	-9.52%	(-0.128-0.089)
		2010	0.035	0.013	(0.016-0.073)	0.076	0.026	(0.039-0.147)	0.042	120.88%	(-0.014-0.099)
		2011	0.097	0.022	(0.062-0.151)	0.093	0.019	(0.062-0.138)	-0.005	-4.69%	(-0.060-0.052)
	22-ETP	2006	0.112	0.015	(0.086-0.144)	0.116	0.019	(0.083-0.159)	0.004	3.42%	(-0.043-0.051)
		2007	0.111	0.014	(0.087-0.141)	0.169	0.028	(0.121-0.234)	0.057	51.58%	(-0.004-0.119)
		2008	0.132	0.016	(0.103-0.167)	0.182	0.027	(0.135-0.243)	0.050	37.88%	(-0.011-0.112)
		2009	0.121	0.020	(0.088-0.167)	0.145	0.026	(0.102-0.204)	0.023	19.04%	(-0.040-0.087)
		2010	0.092	0.012	(0.071-0.117)	0.215	0.031	(0.161-0.285)	0.123	133.49%	(0.057-0.188)
		2011	0.069	0.010	(0.052-0.090)	0.130	0.019	(0.098-0.172)	0.061	88.38%	(0.020-0.102)
	24-CH	2006	0.067	0.015	(0.042-0.104)	0.106	0.030	(0.060-0.186)	0.040	59.06%	(-0.026-0.106)
		2007	0.058	0.015	(0.035-0.094)	0.152	0.035	(0.096-0.239)	0.094	162.62%	(0.020-0.169)
		2008	0.096	0.020	(0.063-0.143)	0.114	0.026	(0.071-0.179)	0.018	19.00%	(-0.046-0.083)
		2009	0.082	0.027	(0.043-0.154)	0.144	0.029	(0.096-0.215)	0.062	75.02%	(-0.015-0.139)
		2010	0.127	0.029	(0.081-0.199)	0.152	0.033	(0.098-0.232)	0.024	19.14%	(-0.061-0.110)
		2011	0.132	0.030	(0.084-0.206)	0.154	0.033	(0.100-0.235)	0.021	16.15%	(-0.066-0.109)
	26-MAV	2006	0.012	0.008	(0.003-0.045)	0.048	0.022	(0.018-0.126)	0.036	300.01%	(-0.010-0.082)
		2007	0.080	0.020	(0.048-0.132)	0.077	0.019	(0.047-0.124)	-0.003	-3.75%	(-0.057-0.051)
		2008	0.142	0.027	(0.097-0.205)	0.124	0.025	(0.083-0.183)	-0.018	-12.68%	(-0.089-0.053)
		2009	0.067	0.017	(0.041-0.110)	0.084	0.022	(0.050-0.139)	0.017	24.61%	(-0.037-0.070)
		2010	0.064	0.016	(0.038-0.105)	0.065	0.014	(0.042-0.101)	0.002	2.35%	(-0.041-0.044)
		2011	0.011	0.006	(0.004-0.030)	0.010	0.004	(0.004-0.022)	-0.001	-5.11%	(-0.014-0.014)
	27-SCP	2006	0.044	0.009	(0.029-0.064)	0.033	0.009	(0.018-0.056)	-0.011	-25.37%	(-0.036-0.014)
		2007	0.050	0.009	(0.035-0.070)	0.041	0.007	(0.029-0.056)	-0.009	-17.51%	(-0.030-0.013)
		2008	0.047	0.013	(0.027-0.081)	0.042	0.007	(0.030-0.057)	-0.006	-11.60%	(-0.034-0.024)
		2009	0.038	0.006	(0.027-0.052)	0.025	0.004	(0.017-0.034)	-0.013	-33.93%	(-0.027-0.002)
		2010	0.051	0.007	(0.038-0.066)	0.041	0.007	(0.029-0.057)	-0.010	-19.30%	(-0.029-0.010)
		2011	0.033	0.006	(0.022-0.047)	0.025	0.005	(0.016-0.037)	-0.008	-24.35%	(-0.023-0.008)
	Overall	2006	0.101	0.009	(0.084-0.121)	0.080	0.008	(0.064-0.098)	-0.022	-21.53%	(-0.046-0.003)
		2007	0.104	0.009	(0.087-0.122)	0.104	0.009	(0.087-0.124)	0.000	0.45%	(-0.024-0.026)
		2008	0.127	0.010	(0.108-0.147)	0.112	0.009	(0.095-0.130)	-0.015	-11.65%	(-0.040-0.011)
		2009	0.102	0.009	(0.085-0.122)	0.090	0.009	(0.073-0.108)	-0.013	-12.25%	(-0.037-0.013)
		2010	0.082	0.007	(0.070-0.096)	0.094	0.009	(0.078-0.112)	0.012	14.39%	(-0.009-0.033)
		2011	0.067	0.006	(0.056-0.080)	0.065	0.006	(0.054-0.077)	-0.003	-3.78%	(-0.019-0.014)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Eastern Meadowlark	Arkansas	2007	0.173	0.037	(0.113-0.265)	0.155	0.032	(0.102-0.233)	-0.018	-10.53%	(-0.113-0.077)
		2008	0.194	0.043	(0.124-0.301)	0.229	0.039	(0.163-0.320)	0.035	18.11%	(-0.077-0.148)
		2009	0.093	0.026	(0.052-0.162)	0.133	0.033	(0.080-0.219)	0.040	43.64%	(-0.043-0.124)
		2010	0.081	0.025	(0.043-0.150)	0.085	0.022	(0.050-0.142)	0.004	5.46%	(-0.061-0.071)
		2011	0.000			0.000					
	Illinois	2006	0.351	0.106	(0.193-0.638)	0.271	0.084	(0.146-0.502)	-0.080	-22.86%	(-0.346-0.185)
		2007	0.223	0.064	(0.126-0.395)	0.540	0.115	(0.352-0.825)	0.316	141.66%	(0.058-0.575)
		2008	0.315	0.093	(0.175-0.566)	0.448	0.108	(0.277-0.724)	0.134	42.43%	(-0.146-0.414)
		2009	0.369	0.165	(0.153-0.887)	0.281	0.130	(0.113-0.696)	-0.088	-23.73%	(-0.499-0.325)
		2010	0.197	0.058	(0.109-0.356)	0.596	0.128	(0.387-0.918)	0.399	202.23%	(0.124-0.674)
		2011	0.160	0.050	(0.085-0.299)	0.273	0.068	(0.164-0.451)	0.113	70.51%	(-0.053-0.279)
	Indiana	2006	0.061	0.024	(0.028-0.131)	0.217	0.071	(0.115-0.410)	0.156	254.70%	(0.009-0.303)
		2007	0.135	0.061	(0.056-0.319)	0.280	0.139	(0.109-0.719)	0.145	107.79%	(-0.152-0.443)
		2008	0.135	0.046	(0.070-0.259)	0.249	0.096	(0.117-0.526)	0.114	84.70%	(-0.094-0.323)
		2009	0.163	0.072	(0.070-0.379)	0.266	0.089	(0.138-0.510)	0.103	63.11%	(-0.122-0.328)
		2010	0.083	0.040	(0.032-0.208)	0.171	0.061	(0.086-0.340)	0.089	107.46%	(-0.053-0.231)
		2011	0.079	0.032	(0.035-0.173)	0.300	0.101	(0.155-0.576)	0.221	279.77%	(0.013-0.429)
	Iowa	2006	0.075	0.018	(0.046-0.12)	0.058	0.021	(0.028-0.119)	-0.017	-22.22%	(-0.071-0.038)
		2007	0.060	0.016	(0.035-0.103)	0.045	0.013	(0.025-0.081)	-0.015	-25.00%	(-0.056-0.027)
		2008	0.050	0.018	(0.024-0.099)	0.057	0.021	(0.027-0.115)	0.007	13.33%	(-0.046-0.060)
		2009	0.044	0.015	(0.023-0.085)	0.030	0.010	(0.015-0.058)	-0.014	-32.08%	(-0.049-0.021)
		2010	0.049	0.015	(0.026-0.091)	0.038	0.012	(0.020-0.069)	-0.012	-23.53%	(-0.049-0.026)
		2011	0.052	0.017	(0.027-0.098)	0.055	0.018	(0.029-0.103)	0.003	6.25%	(-0.044-0.051)
	Kentucky	2006	0.060	0.015	(0.036-0.099)	0.111	0.038	(0.057-0.215)	0.051	84.44%	(-0.028-0.130)
		2007	0.092	0.026	(0.053-0.160)	0.175	0.051	(0.098-0.313)	0.083	90.31%	(-0.029-0.196)
		2008	0.120	0.031	(0.072-0.199)	0.129	0.036	(0.074-0.222)	0.009	7.55%	(-0.083-0.101)
		2009	0.129	0.042	(0.068-0.243)	0.157	0.046	(0.088-0.279)	0.028	21.94%	(-0.092-0.149)
		2010	0.164	0.047	(0.093-0.289)	0.162	0.049	(0.088-0.295)	-0.002	-1.36%	(-0.136-0.132)
		2011	0.177	0.047	(0.103-0.300)	0.194	0.050	(0.116-0.322)	0.017	9.48%	(-0.117-0.151)
	Mississippi	2006	0.059	0.004	(0.052-0.066)	0.065	0.005	(0.056-0.075)	0.006	10.18%	(-0.005-0.018)
		2007	0.053	0.003	(0.047-0.060)	0.060	0.004	(0.053-0.067)	0.007	13.08%	(-0.002-0.017)
		2008	0.057	0.003	(0.051-0.064)	0.057	0.004	(0.050-0.064)	0.000	-0.68%	(-0.010-0.009)
		2009	0.047	0.003	(0.042-0.053)	0.036	0.002	(0.032-0.040)	-0.011	-23.27%	(-0.018--0.003)
		2010	0.098	0.006	(0.086-0.110)	0.107	0.007	(0.094-0.120)	0.009	9.38%	(-0.008-0.027)
		2011	0.075	0.005	(0.066-0.084)	0.068	0.004	(0.060-0.076)	-0.007	-9.59%	(-0.019-0.005)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Eastern Meadowlark	Missouri	2006	0.088	0.016	(0.061-0.126)	0.043	0.011	(0.026-0.070)	-0.045	-50.88%	(-0.082--0.007)
		2007	0.073	0.013	(0.051-0.104)	0.066	0.015	(0.042-0.102)	-0.007	-8.94%	(-0.044-0.032)
		2008	0.111	0.017	(0.081-0.151)	0.058	0.013	(0.037-0.090)	-0.053	-47.53%	(-0.095--0.010)
		2009	0.067	0.010	(0.049-0.089)	0.056	0.011	(0.037-0.083)	-0.011	-15.99%	(-0.040-0.019)
		2010	0.118	0.016	(0.089-0.155)	0.103	0.018	(0.072-0.146)	-0.015	-12.49%	(-0.062-0.033)
		2011	0.068	0.013	(0.046-0.099)	0.048	0.010	(0.032-0.071)	-0.020	-29.65%	(-0.052-0.012)
	Nebraska	2007	0.638	0.230	(0.316-1.285)	0.459	0.169	(0.225-0.936)	-0.179	-27.99%	(-0.737-0.380)
		2008	0.847	0.177	(0.561-1.276)	0.743	0.156	(0.492-1.120)	-0.104	-12.24%	(-0.565-0.359)
		2009	0.364	0.101	(0.211-0.625)	0.258	0.094	(0.127-0.523)	-0.106	-29.17%	(-0.376-0.164)
		2010	0.109	0.045	(0.049-0.241)	0.211	0.089	(0.093-0.475)	0.102	93.62%	(-0.093-0.297)
		2011	0.164	0.062	(0.079-0.340)	0.154	0.061	(0.071-0.331)	-0.010	-6.26%	(-0.180-0.160)
	North Carolina	2007	0.040	0.012	(0.021-0.074)	0.025	0.007	(0.013-0.044)	-0.016	-38.64%	(-0.043-0.013)
		2008	0.044	0.024	(0.015-0.124)	0.014	0.006	(0.006-0.031)	-0.030	-68.34%	(-0.078-0.019)
		2009	0.025	0.008	(0.013-0.046)	0.014	0.005	(0.006-0.029)	-0.011	-44.45%	(-0.029-0.007)
		2010	0.035	0.010	(0.019-0.060)	0.013	0.005	(0.005-0.028)	-0.022	-63.09%	(-0.043--0.000)
		2011	0.015	0.007	(0.006-0.035)	0.006	0.003	(0.001-0.017)	-0.010	-62.70%	(-0.024-0.005)
	Ohio	2006	0.086	0.021	(0.053-0.138)	0.020	0.006	(0.011-0.034)	-0.066	-76.85%	(-0.108--0.023)
		2007	0.076	0.018	(0.047-0.120)	0.026	0.009	(0.013-0.050)	-0.050	-65.63%	(-0.088--0.010)
		2008	0.069	0.020	(0.039-0.122)	0.024	0.007	(0.012-0.043)	-0.046	-66.04%	(-0.087--0.004)
		2009	0.056	0.018	(0.030-0.103)	0.027	0.008	(0.015-0.047)	-0.029	-51.48%	(-0.066-0.009)
		2010	0.019	0.007	(0.009-0.037)	0.013	0.006	(0.005-0.032)	-0.006	-30.91%	(-0.023-0.012)
		2011	0.031	0.009	(0.017-0.054)	0.018	0.005	(0.009-0.031)	-0.013	-42.24%	(-0.033-0.008)
	Tennessee	2006	0.061	0.018	(0.033-0.110)	0.039	0.019	(0.014-0.099)	-0.022	-36.51%	(-0.074-0.030)
		2007	0.015	0.011	(0.003-0.055)	0.036	0.018	(0.013-0.095)	0.021	143.70%	(-0.019-0.062)
		2008	0.039	0.014	(0.019-0.079)	0.074	0.020	(0.043-0.127)	0.035	89.84%	(-0.013-0.084)
		2009	0.079	0.022	(0.045-0.136)	0.046	0.012	(0.028-0.076)	-0.032	-41.05%	(-0.081-0.016)
		2010	0.059	0.015	(0.035-0.098)	0.064	0.018	(0.037-0.111)	0.005	8.15%	(-0.041-0.051)
		2011	0.065	0.025	(0.029-0.140)	0.040	0.018	(0.016-0.094)	-0.025	-38.69%	(-0.085-0.036)
	Texas	2006	0.167	0.035	(0.108-0.255)	0.134	0.027	(0.089-0.200)	-0.033	-19.53%	(-0.119-0.055)
		2007	0.097	0.022	(0.062-0.151)	0.102	0.023	(0.064-0.160)	0.005	4.99%	(-0.057-0.067)
		2008	0.118	0.021	(0.083-0.167)	0.123	0.020	(0.088-0.171)	0.005	4.21%	(-0.051-0.062)
		2009	0.134	0.025	(0.091-0.194)	0.122	0.033	(0.070-0.209)	-0.012	-8.93%	(-0.093-0.0709)
		2010	0.008	0.006	(0.001-0.031)	0.011	0.006	(0.004-0.029)	0.004	48.03%	(-0.012-0.020)
		2011	0.054	0.015	(0.030-0.094)	0.058	0.012	(0.038-0.087)	0.004	7.50%	(-0.033-0.042)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Indigo Bunting	22-ETP	2006	0.774	0.073	(0.642-0.932)	1.126	0.077	(0.984-1.289)	0.353	45.56%	(0.144-0.561)
		2007	0.858	0.078	(0.718-1.024)	1.278	0.087	(1.117-1.460)	0.420	48.93%	(0.192-0.648)
		2008	0.713	0.065	(0.595-0.853)	1.049	0.086	(0.893-1.231)	0.336	47.17%	(0.125-0.547)
		2009	0.973	0.099	(0.797-1.187)	1.302	0.107	(1.108-1.529)	0.329	33.84%	(0.045-0.614)
		2010	1.160	0.102	(0.975-1.379)	1.591	0.107	(1.393-1.816)	0.431	37.12%	(0.141-0.721)
		2011	0.779	0.058	(0.673-0.901)	1.044	0.072	(0.910-1.195)	0.265	33.98%	(0.084-0.446)
	24-CH	2006	2.042	0.359	(1.449-2.878)	2.455	0.337	(1.876-3.212)	0.413	20.22%	(-0.551-1.378)
		2007	2.874	0.515	(2.025-4.078)	3.054	0.538	(2.165-4.306)	0.180	6.25%	(-1.280-1.640)
		2008	1.572	0.239	(1.168-2.116)	2.287	0.400	(1.625-3.217)	0.714	45.41%	(-0.198-1.627)
		2009	2.003	0.367	(1.401-2.862)	2.680	0.451	(1.929-3.721)	0.677	33.80%	(-0.461-1.816)
		2010	2.960	0.564	(2.042-4.290)	2.635	0.391	(1.970-3.522)	-0.326	-11.01%	(-1.671-1.019)
		2011	2.489	1.218	(1.000-6.194)	1.551	0.241	(1.145-2.100)	-0.938	-37.68%	(-3.371-1.496)
	26-MAV	2006	1.249	0.389	(0.648-2.405)	1.363	0.346	(0.798-2.323)	0.114	9.10%	(-0.906-1.133)
		2007	0.808	0.128	(0.590-1.104)	1.027	0.162	(0.751-1.402)	0.219	27.12%	(-0.186-0.625)
		2008	1.155	0.156	(0.885-1.505)	1.226	0.176	(0.925-1.625)	0.071	6.18%	(-0.388-0.532)
		2009	1.027	0.149	(0.772-1.365)	0.805	0.121	(0.597-1.082)	-0.222	-21.64%	(-0.598-0.154)
		2010	0.867	0.124	(0.654-1.149)	0.854	0.136	(0.624-1.167)	-0.013	-1.55%	(-0.373-0.347)
		2011	0.634	0.101	(0.463-0.867)	0.587	0.096	(0.424-0.810)	-0.047	-7.46%	(-0.320-0.225)
	27-SCP	2006	0.960	0.060	(0.848-1.086)	1.361	0.077	(1.218-1.521)	0.401	41.78%	(0.210-0.592)
		2007	0.758	0.044	(0.675-0.849)	1.022	0.051	(0.925-1.128)	0.264	34.88%	(0.132-0.397)
		2008	0.830	0.044	(0.746-0.922)	1.075	0.052	(0.977-1.182)	0.245	29.56%	(0.111-0.379)
		2009	0.782	0.051	(0.688-0.887)	1.034	0.058	(0.925-1.154)	0.252	32.25%	(0.101-0.403)
		2010	0.756	0.043	(0.675-0.846)	1.052	0.049	(0.959-1.153)	0.296	39.10%	(0.167-0.424)
		2011	0.612	0.041	(0.537-0.697)	0.838	0.045	(0.754-0.930)	0.226	36.84%	(0.107-0.344)
	29-PIED	2007	0.504	0.063	(0.378-0.670)	0.551	0.083	(0.388-0.782)	0.047	9.37%	(-0.156-0.251)
		2008	0.472	0.094	(0.295-0.756)	0.653	0.092	(0.471-0.906)	0.181	38.33%	(-0.076-0.439)
		2009	0.224	0.063	(0.115-0.434)	0.366	0.080	(0.217-0.614)	0.142	63.16%	(-0.057-0.341)
		2010	0.283	0.038	(0.208-0.385)	0.354	0.066	(0.227-0.551)	0.071	25.00%	(-0.078-0.221)
		2011	0.177	0.034	(0.112-0.280)	0.319	0.072	(0.186-0.545)	0.142	80.00%	(-0.015-0.299)
	Overall	2006	1.225	0.132	(0.991-1.512)	2.114	0.174	(1.799-2.484)	0.890	72.67%	(0.461-1.318)
		2007	1.137	0.098	(0.959-1.346)	1.617	0.111	(1.412-1.849)	0.480	42.21%	(0.189-0.771)
		2008	1.218	0.115	(1.011-1.465)	1.528	0.130	(1.293-1.806)	0.311	25.51%	(-0.030-0.652)
		2009	1.129	0.103	(0.944-1.350)	1.567	0.123	(1.344-1.825)	0.437	38.71%	(0.123-0.751)
		2010	0.992	0.084	(0.839-1.171)	1.407	0.108	(1.210-1.634)	0.415	41.82%	(0.147-0.683)
		2011	0.602	0.070	(0.479-0.756)	0.807	0.082	(0.662-0.983)	0.205	34.08%	(-0.005-0.416)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Indigo Bunting	Arkansas	2007	0.703	0.173	(0.433-1.137)	0.830	0.203	(0.515-1.335)	0.127	18.10%	(-0.395-0.650)
		2008	1.142	0.230	(0.770-1.692)	1.135	0.247	(0.743-1.734)	-0.007	-0.60%	(-0.668-0.655)
		2009	1.106	0.244	(0.719-1.698)	0.740	0.176	(0.466-1.175)	-0.365	-33.05%	(-0.953-0.223)
		2010	0.699	0.149	(0.462-1.058)	0.722	0.175	(0.450-1.158)	0.023	3.28%	(-0.427-0.473)
		2011	0.526	0.132	(0.322-0.857)	0.454	0.110	(0.283-0.727)	-0.071	-13.60%	(-0.407-0.264)
	Georgia	2006	0.293	0.065	(0.189-0.453)	0.469	0.083	(0.330-0.664)	0.176	60.17%	(-0.030-0.383)
		2007	0.304	0.071	(0.191-0.481)	0.378	0.073	(0.258-0.552)	0.074	24.33%	(-0.126-0.274)
		2008	0.320	0.073	(0.204-0.500)	0.369	0.066	(0.26-0.524)	0.049	15.46%	(-0.143-0.242)
		2009	0.299	0.058	(0.203-0.436)	0.461	0.072	(0.339-0.625)	0.162	54.37%	(-0.018-0.343)
		2010	0.261	0.052	(0.175-0.387)	0.473	0.074	(0.348-0.642)	0.212	81.37%	(0.035-0.390)
		2011	0.185	0.043	(0.116-0.291)	0.404	0.073	(0.283-0.575)	0.220	119.04%	(0.054-0.385)
	Illinois	2006	0.893	0.161	(0.621-1.281)	1.910	0.304	(1.395-2.614)	1.018	113.99%	(0.343-1.692)
		2007	1.324	0.204	(0.973-1.800)	2.469	0.375	(1.829-3.330)	1.145	86.49%	(0.308-1.982)
		2008	1.074	0.176	(0.773-1.491)	2.198	0.382	(1.560-3.096)	1.124	104.63%	(0.300-1.948)
		2009	1.903	0.397	(1.247-2.903)	3.403	0.607	(2.386-4.851)	1.499	78.78%	(0.078-2.921)
		2010	2.140	0.319	(1.584-2.891)	3.302	0.537	(2.392-4.559)	1.162	54.30%	(-0.063-2.387)
		2011	1.029	0.135	(0.790-1.339)	1.992	0.344	(1.413-2.806)	0.963	93.59%	(0.238-1.688)
	Indiana	2006	0.596	0.240	(0.277-1.283)	3.135	0.961	(1.735-5.662)	2.538	425.53%	(0.596-4.480)
		2007	2.625	1.139	(1.156-5.958)	2.327	0.616	(1.392-3.889)	-0.297	-11.33%	(-2.835-2.241)
		2008	0.875	0.184	(0.579-1.321)	1.649	0.500	(0.918-2.960)	0.774	88.39%	(-0.270-1.818)
		2009	1.395	0.421	(0.778-2.498)	2.502	0.471	(1.731-3.615)	1.108	79.44%	(-0.130-2.346)
		2010	1.113	0.265	(0.699-1.770)	1.679	0.372	(1.090-2.587)	0.567	50.92%	(-0.329-1.462)
		2011	1.535	0.421	(0.901-2.612)	1.804	0.374	(1.203-2.702)	0.269	17.52%	(-0.834-1.372)
	Iowa	2006	0.065	0.021	(0.033-0.123)	0.120	0.029	(0.074-0.193)	0.055	85.72%	(-0.014-0.126)
		2007	0.050	0.020	(0.023-0.107)	0.071	0.024	(0.036-0.137)	0.020	40.00%	(-0.040-0.081)
		2008	0.078	0.024	(0.042-0.141)	0.116	0.030	(0.070-0.193)	0.039	50.00%	(-0.035-0.113)
		2009	0.049	0.020	(0.022-0.108)	0.117	0.031	(0.069-0.197)	0.068	137.73%	(-0.003-0.140)
		2010	0.053	0.017	(0.028-0.099)	0.130	0.037	(0.074-0.228)	0.077	145.45%	(-0.002-0.157)
		2011	0.103	0.032	(0.055-0.191)	0.087	0.025	(0.048-0.154)	-0.016	-15.79%	(-0.096-0.064)
	Kentucky	2006	2.404	0.379	(1.766-3.272)	2.810	0.364	(2.180-3.621)	0.406	16.89%	(-0.623-1.435)
		2007	3.186	0.468	(2.389-4.249)	3.342	0.445	(2.573-4.340)	0.156	4.88%	(-1.111-1.422)
		2008	2.248	0.402	(1.584-3.188)	2.348	0.470	(1.589-3.468)	0.100	4.43%	(-1.112-1.312)
		2009	2.173	0.438	(1.466-3.218)	2.874	0.456	(2.107-3.919)	0.701	32.27%	(-0.538-1.941)
		2010	5.376	2.273	(2.419-11.94)	2.613	0.427	(1.899-3.594)	-2.763	-51.40%	(-7.295-1.769)
		2011	1.863	0.616	(0.988-3.512)	1.350	0.168	(1.057-1.724)	-0.514	-27.56%	(-1.764-0.738)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Indigo Bunting	Mississippi	2006	0.866	0.055	(0.762-0.982)	1.106	0.070	(0.975-1.254)	0.241	27.83%	(0.066-0.415)
		2007	0.704	0.033	(0.642-0.770)	0.727	0.032	(0.666-0.791)	0.023	3.24%	(-0.066-0.112)
		2008	0.636	0.032	(0.576-0.701)	0.708	0.031	(0.650-0.771)	0.072	11.39%	(-0.014-0.159)
		2009	0.483	0.023	(0.440-0.529)	0.515	0.021	(0.475-0.558)	0.033	6.74%	(-0.028-0.093)
		2010	0.572	0.027	(0.520-0.628)	0.585	0.026	(0.536-0.638)	0.013	2.36%	(-0.060-0.087)
		2011	0.468	0.021	(0.428-0.511)	0.472	0.019	(0.436-0.510)	0.003	0.71%	(-0.052-0.059)
	Missouri	2006	0.557	0.092	(0.402-0.770)	0.484	0.064	(0.373-0.628)	-0.072	-13.02%	(-0.291-0.147)
		2007	0.634	0.128	(0.427-0.939)	0.944	0.207	(0.615-1.448)	0.310	48.96%	(-0.166-0.788)
		2008	0.754	0.224	(0.424-1.338)	2.025	0.989	(0.814-5.032)	1.271	168.49%	(-0.716-3.257)
		2009	0.000			1.447	0.368	(0.883-2.370)			
		2010	1.362	0.266	(0.930-1.993)	2.258	0.460	(1.519-3.356)	0.896	65.77%	(-0.145-1.938)
		2011	0.328	0.054	(0.238-0.452)	0.784	0.281	(0.394-1.558)	0.456	138.97%	(-0.104-1.017)
	North Carolina	2007	0.311	0.033	(0.251-0.385)	0.403	0.035	(0.337-0.480)	0.092	29.50%	(-0.003-0.187)
		2008	0.366	0.033	(0.305-0.439)	0.441	0.038	(0.370-0.525)	0.075	20.55%	(-0.024-0.175)
		2009	0.294	0.029	(0.241-0.358)	0.337	0.032	(0.278-0.407)	0.043	14.63%	(-0.041-0.128)
		2010	0.269	0.024	(0.225-0.321)	0.334	0.026	(0.286-0.389)	0.065	24.12%	(-0.003-0.133)
		2011	0.239	0.024	(0.195-0.292)	0.314	0.027	(0.264-0.373)	0.075	31.28%	(0.0041-0.145)
	Ohio	2006	0.418	0.098	(0.263-0.662)	1.654	0.237	(1.247-2.192)	1.236	295.81%	(0.734-1.739)
		2007	0.468	0.100	(0.307-0.712)	2.211	0.277	(1.729-2.828)	1.743	372.37%	(1.166-2.320)
		2008	0.227	0.072	(0.121-0.423)	0.587	0.143	(0.362-0.950)	0.360	159.11%	(0.045-0.675)
		2009	0.548	0.097	(0.387-0.775)	1.534	0.190	(1.202-1.957)	0.986	179.90%	(0.568-1.404)
		2010	0.371	0.073	(0.251-0.546)	1.553	0.183	(1.232-1.956)	1.182	318.79%	(0.796-1.568)
		2011	0.464	0.076	(0.336-0.639)	1.641	0.193	(1.301-2.067)	1.177	253.65%	(0.770-1.583)
	South Carolina	2006	0.329	0.053	(0.239-0.453)	0.483	0.073	(0.356-0.654)	0.154	46.67%	(-0.022-0.330)
		2007	0.351	0.060	(0.250-0.493)	0.520	0.071	(0.395-0.682)	0.168	47.92%	(-0.013-0.350)
		2008	0.354	0.045	(0.274-0.454)	0.384	0.054	(0.290-0.508)	0.031	8.70%	(-0.106-0.168)
		2009	0.299	0.045	(0.221-0.403)	0.369	0.047	(0.285-0.477)	0.070	23.48%	(-0.057-0.198)
		2010	0.321	0.042	(0.246-0.417)	0.492	0.052	(0.398-0.607)	0.172	53.51%	(0.041-0.302)
		2011	0.294	0.041	(0.222-0.389)	0.389	0.045	(0.308-0.489)	0.095	32.13%	(-0.024-0.214)
	Tennessee	2006	4.047	0.974	(2.535-6.459)	3.406	0.612	(2.398-4.837)	-0.641	-15.84%	(-2.895-1.614)
		2007	0.000			4.500	1.076	(2.824-7.168)			
		2008	3.009	0.638	(1.990-4.547)	3.647	0.702	(2.505-5.308)	0.638	21.21%	(-1.220-2.497)
		2009	2.198	0.372	(1.578-3.059)	3.036	0.482	(2.225-4.141)	0.838	38.12%	(-0.356-2.032)
		2010	2.433	0.451	(1.694-3.492)	2.856	0.513	(2.011-4.054)	0.423	17.40%	(-0.916-1.763)
		2011	0.888	0.170	(0.611-1.291)	1.225	0.215	(0.869-1.726)	0.337	37.92%	(-0.199-0.874)

Appendix A

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Grasshopper Sparrow	19-CMP	2006	0.380	0.168	(0.161-0.894)	0.145	0.043	(0.079-0.262)	-0.235	-61.91%	(-0.575-0.105)
		2007	0.221	0.102	(0.091-0.533)	0.238	0.103	(0.104-0.545)	0.017	7.58%	(-0.267-0.301)
		2008	0.099	0.039	(0.046-0.209)	0.219	0.096	(0.094-0.506)	0.120	120.68%	(-0.082-0.322)
		2009	0.082	0.043	(0.030-0.220)	0.259	0.084	(0.137-0.488)	0.177	216.31%	(-0.008-0.362)
		2010	0.498	0.139	(0.289-0.856)	0.390	0.088	(0.250-0.607)	-0.108	-21.68%	(-0.429-0.213)
		2011	0.202	0.091	(0.085-0.475)	0.145	0.052	(0.072-0.290)	-0.057	-28.28%	(-0.261-0.148)
	22-ETP	2006	0.112	0.023	(0.074-0.166)	0.092	0.018	(0.062-0.135)	-0.020	-17.80%	(-0.077-0.037)
		2007	0.081	0.020	(0.050-0.130)	0.069	0.019	(0.040-0.118)	-0.012	-14.62%	(-0.065-0.042)
		2008	0.132	0.029	(0.085-0.203)	0.126	0.029	(0.081-0.195)	-0.006	-4.36%	(-0.085-0.074)
		2009	0.123	0.026	(0.081-0.184)	0.178	0.041	(0.114-0.277)	0.055	45.22%	(-0.038-0.150)
		2010	0.095	0.023	(0.059-0.153)	0.125	0.029	(0.080-0.195)	0.030	31.25%	(-0.042-0.102)
		2011	0.105	0.023	(0.068-0.162)	0.113	0.043	(0.055-0.231)	0.008	7.43%	(-0.087-0.103)
	24-CH	2006	0.081	0.043	(0.029-0.218)	0.164	0.105	(0.050-0.530)	0.084	103.54%	(-0.139-0.306)
		2007	0.102	0.048	(0.041-0.250)	0.143	0.052	(0.070-0.288)	0.041	39.93%	(-0.098-0.180)
		2008	0.114	0.045	(0.053-0.241)	0.143	0.075	(0.053-0.381)	0.029	25.17%	(-0.141-0.199)
		2009	0.037	0.020	(0.013-0.100)	0.103	0.054	(0.038-0.274)	0.066	180.23%	(-0.045-0.179)
		2010	0.105	0.038	(0.052-0.211)	0.189	0.076	(0.087-0.409)	0.084	80.40%	(-0.082-0.251)
		2011	0.106	0.043	(0.048-0.231)	0.114	0.058	(0.043-0.294)	0.008	7.80%	(-0.132-0.149)
	27-SCP	2006	0.016	0.009	(0.005-0.045)	0.020	0.009	(0.008-0.044)	0.004	25.00%	(-0.020-0.028)
		2007	0.015	0.009	(0.004-0.044)	0.009	0.006	(0.003-0.027)	-0.005	-36.84%	(-0.025-0.015)
		2008	0.028	0.015	(0.010-0.077)	0.000					
		2009	0.014	0.007	(0.005-0.037)	0.008	0.006	(0.002-0.030)	-0.006	-41.86%	(-0.024-0.013)
		2010	0.049	0.025	(0.019-0.125)	0.051	0.017	(0.026-0.095)	0.002	3.42%	(-0.056-0.060)
		2011	0.000			0.009	0.007	(0.002-0.032)			
	Overall	2006	0.087	0.014	(0.062-0.120)	0.085	0.015	(0.060-0.119)	-0.002	-2.51%	(-0.042-0.038)
		2007	0.089	0.015	(0.064-0.122)	0.094	0.017	(0.066-0.134)	0.006	6.45%	(-0.038-0.050)
		2008	0.089	0.014	(0.064-0.120)	0.098	0.019	(0.068-0.142)	0.010	11.13%	(-0.035-0.056)
		2009	0.059	0.011	(0.041-0.083)	0.115	0.020	(0.081-0.161)	0.056	94.96%	(0.012-0.100)
		2010	0.100	0.015	(0.074-0.133)	0.143	0.020	(0.109-0.187)	0.043	43.25%	(-0.005-0.092)
		2011	0.082	0.014	(0.058-0.115)	0.091	0.020	(0.060-0.138)	0.009	11.47%	(-0.038-0.057)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

			Non-buffered			Buffered			Effect Size		
			Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Eastern Kingbird	19-CMP	2006				0.081	0.063	(0.020-0.329)			
		2007	0.223	0.160	(0.061-0.813)	0.424	0.223	(0.157-1.141)	0.201	90.00%	(-0.338-0.740)
		2008	0.182	0.099	(0.065-0.504)	0.251	0.134	(0.092-0.682)	0.068	37.50%	(-0.257-0.394)
		2009	0.275	0.126	(0.114-0.658)	0.417	0.226	(0.151-1.150)	0.143	52.00%	(-0.363-0.649)
		2010	0.097	0.041	(0.043-0.216)	0.213	0.104	(0.084-0.536)	0.116	119.60%	(-0.102-0.335)
		2011	0.071	0.032	(0.029-0.168)	0.162	0.078	(0.065-0.403)	0.091	128.57%	(-0.073-0.256)
	22-ETP	2006	0.069	0.024	(0.034-0.134)	0.087	0.026	(0.049-0.155)	0.019	27.61%	(-0.050-0.089)
		2007	0.134	0.028	(0.089-0.202)	0.169	0.035	(0.113-0.251)	0.035	25.79%	(-0.053-0.122)
		2008	0.163	0.032	(0.111-0.238)	0.174	0.042	(0.109-0.277)	0.011	6.67%	(-0.091-0.113)
		2009	0.131	0.042	(0.070-0.242)	0.143	0.030	(0.095-0.215)	0.013	9.90%	(-0.088-0.114)
		2010	0.048	0.013	(0.028-0.079)	0.123	0.024	(0.084-0.180)	0.076	158.82%	(0.022-0.129)
		2011	0.102	0.022	(0.066-0.155)	0.120	0.025	(0.079-0.181)	0.018	18.10%	(-0.047-0.085)
	24-CH	2006	0.089	0.044	(0.034-0.226)	0.119	0.057	(0.047-0.296)	0.030	33.34%	(-0.111-0.171)
		2007	0.163	0.062	(0.077-0.341)	0.240	0.068	(0.137-0.419)	0.077	47.37%	(-0.104-0.259)
		2008	0.136	0.046	(0.070-0.264)	0.129	0.054	(0.057-0.289)	-0.008	-5.66%	(-0.147-0.132)
		2009	0.066	0.026	(0.031-0.140)	0.081	0.044	(0.029-0.223)	0.015	22.76%	(-0.084-0.115)
		2010	0.075	0.047	(0.023-0.239)	0.152	0.054	(0.076-0.301)	0.077	102.48%	(-0.063-0.217)
		2011	0.059	0.022	(0.028-0.121)	0.141	0.068	(0.056-0.352)	0.083	141.37%	(-0.057-0.223)
	27-SCP	2006	0.340	0.091	(0.203-0.569)	0.135	0.038	(0.077-0.233)	-0.206	-60.47%	(-0.398--0.012)
		2007	0.369	0.092	(0.226-0.598)	0.101	0.022	(0.065-0.155)	-0.268	-72.59%	(-0.453--0.081)
		2008	0.169	0.053	(0.092-0.308)	0.079	0.019	(0.049-0.126)	-0.090	-53.31%	(-0.200-0.020)
		2009	0.230	0.062	(0.136-0.386)	0.102	0.020	(0.069-0.150)	-0.128	-55.55%	(-0.254--0.000)
		2010	0.269	0.070	(0.163-0.444)	0.066	0.016	(0.041-0.105)	-0.204	-75.61%	(-0.343--0.063)
		2011	0.221	0.065	(0.126-0.388)	0.067	0.018	(0.040-0.112)	-0.154	-69.54%	(-0.285--0.022)
	Overall	2006	0.118	0.022	(0.082-0.168)	0.100	0.019	(0.068-0.145)	-0.018	-15.28%	(-0.074-0.039)
		2007	0.189	0.028	(0.140-0.252)	0.159	0.023	(0.120-0.210)	-0.029	-15.51%	(-0.100-0.042)
		2008	0.145	0.021	(0.109-0.192)	0.119	0.018	(0.088-0.160)	-0.026	-17.68%	(-0.079-0.029)
		2009	0.150	0.024	(0.109-0.205)	0.128	0.020	(0.094-0.174)	-0.022	-14.48%	(-0.083-0.041)
		2010	0.124	0.017	(0.094-0.162)	0.110	0.014	(0.086-0.141)	-0.014	-11.13%	(-0.057-0.030)
		2011	0.111	0.016	(0.083-0.147)	0.098	0.014	(0.074-0.130)	-0.013	-11.38%	(-0.054-0.030)

BCR and state-level density (males/ha) estimates, standard error, 95% confidence intervals, simple effect size, 95% confidence intervals for effect size, and relative effect size for species of interest on surveyed CP33 fields and control fields during the breeding season from 2006-2011 (continued).

		Non-buffered			Buffered			Effect Size		
		Males/ ha	SE	95% CI	Males/ ha	SE	95% CI	Simple	Relative	95% CI ES
Bell's Vireo	2006				0.008	0.008	(0.001-0.044)			
	2007	0.041	0.017	(0.018-0.089)	0.032	0.014	(0.014-0.072)	-0.009	-21.63%	(-0.051-0.034)
	2008	0.045	0.019	(0.019-0.101)	0.053	0.020	(0.026-0.107)	0.008	17.72%	(-0.046-0.062)
	2009	0.028	0.012	(0.012-0.063)	0.031	0.012	(0.015-0.064)	0.003	9.76%	(-0.030-0.036)
	2010	0.106	0.048	(0.045-0.249)	0.150	0.035	(0.095-0.235)	0.044	41.41%	(-0.072-0.160)
	2011	0.089	0.048	(0.032-0.239)	0.116	0.032	(0.068-0.198)	0.028	31.48%	(-0.084-0.140)
Painted Bunting	2006	0.032	0.012	(0.015-0.064)	0.076	0.018	(0.047-0.119)	0.044	137.15%	(0.002-0.085)
	2007	0.033	0.009	(0.019-0.055)	0.036	0.009	(0.023-0.057)	0.003	9.37%	(-0.021-0.027)
	2008	0.038	0.010	(0.023-0.062)	0.038	0.008	(0.025-0.058)	0.000	0.35%	(-0.024-0.025)
	2009	0.074	0.022	(0.040-0.132)	0.048	0.014	(0.027-0.084)	-0.025	-34.47%	(-0.077-0.027)
	2010	0.056	0.016	(0.031-0.096)	0.043	0.010	(0.026-0.068)	-0.013	-23.16%	(-0.050-0.024)
	2011	0.086	0.018	(0.056-0.130)	0.033	0.008	(0.021-0.051)	-0.053	-61.19%	(-0.091--0.013)
Upland Sandpiper	2007	0.035	0.025	(0.009-0.125)	0.018	0.013	(0.004-0.063)	-0.017	-49.75%	(-0.072-0.038)
	2008	0.011	0.007	(0.003-0.035)	0.038	0.022	(0.012-0.112)	0.027	251.86%	(-0.018-0.073)
	2009	0.029	0.018	(0.009-0.088)	0.022	0.015	(0.006-0.072)	-0.007	-23.93%	(-0.051-0.038)
	2010	0.055	0.022	(0.025-0.116)	0.036	0.019	(0.013-0.095)	-0.018	-33.57%	(-0.074-0.038)
	2011	0.050	0.020	(0.022-0.108)	0.046	0.019	(0.020-0.100)	-0.004	-7.58%	(-0.058-0.051)
Vesper Sparrow	2006	0.023	0.007	(0.013-0.041)	0.040	0.009	(0.025-0.061)	0.016	70.74%	(-0.006-0.039)
	2007	0.020	0.006	(0.011-0.035)	0.017	0.005	(0.009-0.030)	-0.004	-17.59%	(-0.018-0.012)
	2008	0.018	0.005	(0.010-0.031)	0.029	0.008	(0.016-0.050)	0.011	59.16%	(-0.008-0.030)
	2009	0.014	0.004	(0.007-0.024)	0.035	0.009	(0.020-0.057)	0.021	156.97%	(0.002-0.041)
	2010	0.024	0.005	(0.016-0.037)	0.023	0.007	(0.012-0.041)	-0.001	-4.98%	(-0.018-0.016)
	2011	0.019	0.004	(0.012-0.029)	0.032	0.007	(0.020-0.049)	0.013	64.95%	(-0.003-0.029)
Scissor-tailed Flycatcher	2006	0.965	0.128	(0.737-1.262)	0.969	0.143	(0.720-1.303)	0.004	0.43%	(-0.372-0.381)
	2007	0.617	0.080	(0.477-0.796)	0.895	0.109	(0.703-1.137)	0.278	45.06%	(0.014-0.542)
	2008	0.537	0.059	(0.433-0.666)	0.710	0.095	(0.544-0.926)	0.173	32.18%	(-0.046-0.392)
	2009	0.385	0.082	(0.253-0.585)	0.454	0.097	(0.298-0.691)	0.069	17.86%	(-0.180-0.318)
	2010	0.288	0.059	(0.191-0.432)	0.333	0.069	(0.221-0.500)	0.045	15.80%	(-0.132-0.224)
	2011	0.164	0.032	(0.111-0.239)	0.251	0.043	(0.178-0.352)	0.087	52.98%	(-0.018-0.192)

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BCR and state-level density estimates (coveys/ha), standard error, 95% confidence intervals, and simple effect size, 95% confidence intervals for effect size, and relative effect size for non-adjusted bobwhite coveys on surveyed CP33 and control fields during the fall of 2006-2008, and BCR and state-level density estimates, 95% bootstrap confidence intervals, and simple and relative effect size for bobwhite coveys adjusted for calling rate (includes: number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004)).

		Density (males/ha)								
		Control	SE	95% CI	CP33	SE	95% CI	Effect Size	95% CI (ES)	Relative ES
19-CMP	2006	0.306850	0.081328	0.183-0.514	0.364230	0.085025	0.231-0.574	0.057380	(-0.173-0.288)	0.186997
	2007	0.255580	0.046883	0.178-0.367	0.263540	0.044773	0.189-0.368	0.007960	(-0.119-0.135)	0.031145
	2008	0.173370	0.030456	0.122-0.246	0.309180	0.067808	0.201-0.475	0.135810	(-0.010-0.282)	0.783354
22-ETP	2006	0.019798	0.003613	0.014-0.028	0.027744	0.004152	0.021-0.037	0.007946	(-0.003-0.019)	0.401354
	2007	0.015745	0.003113	0.011-0.023	0.023807	0.003662	0.012-0.032	0.008062	(-0.001-0.018)	0.512036
	2008	0.013403	0.002706	0.009-0.020	0.018974	0.003023	0.014-0.026	0.005571	(-0.002-0.014)	0.415653
24-CH	2006	0.029463	0.005212	0.021-0.042	0.040963	0.007713	0.028-0.059	0.011500	(-0.007-0.030)	0.390320
	2007	0.018490	0.004066	0.012-0.029	0.036037	0.005801	0.026-0.050	0.017547	(0.004-0.031)	0.948999
	2008	0.020481	0.004078	0.012-0.030	0.039961	0.007870	0.027-0.059	0.019480	(0.002-0.037)	0.951125
26-MAV	2006	0.006792	0.002151	0.004-0.013	0.019990	0.004975	0.012-0.033	0.013199	(0.003-0.024)	1.943385
	2007	0.006295	0.002258	0.003-0.013	0.017626	0.006044	0.009-0.034	0.011331	(-0.001-0.024)	1.799911
	2008	0.006421	0.003233	0.002-0.017	0.017288	0.006092	0.009-0.034	0.010867	(-0.003-0.024)	1.692374
27-SCP	2006	0.014747	0.002423	0.010-0.020	0.045040	0.005238	0.036-0.057	0.030293	(0.019-0.042)	2.054181
	2007	0.014259	0.002343	0.010-0.020	0.040342	0.004986	0.032-0.051	0.026083	(0.015-0.037)	1.829231
	2008	0.013615	0.002257	0.010-0.019	0.051406	0.005874	0.041-0.064	0.037791	(0.025-0.050)	2.775689
Overall	2006	0.029248	0.002776	0.024-0.035	0.043947	0.006011	0.034-0.057	0.014699	(0.002-0.028)	0.502564
	2007	0.033027	0.004223	0.026-0.042	0.056035	0.005294	0.047-0.067	0.023008	(0.010-0.036)	0.696642
	2008	0.023119	0.002400	0.019-0.028	0.048447	0.005125	0.039-0.060	0.025328	(0.014-0.036)	1.095549

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		Density (males/ha)								
		Control	**SE**	**95% CI**	**CP33**	**SE**	**95% CI**	**Effect Size**	**95% CI (ES)**	**Relative ES**
Arkansas	2006	0.012196	0.007805	0.004-0.039	0.023203	0.012492	0.009-0.063	0.011007	(-0.018-0.040)	0.902509
	2007	0.014604	0.009245	0.005-0.046	0.025035	0.015354	0.008-0.077	0.010431	(-0.025-0.046)	0.714256
	2008	0.006795	0.005864	0.002-0.030	0.011325	0.008960	0.003-0.046	0.004530	(-0.017-0.026)	0.666642
Georgia	2006	0.033192	0.009695	0.019-0.059	0.076945	0.017785	0.048-0.122	0.043753	(0.004-0.083)	1.318179
	2007	0.019613	0.006951	0.010-0.039	0.057331	0.014548	0.035-0.095	0.037718	(0.006-0.069)	1.923112
	2008	0.026476	0.008244	0.014-0.049	0.095001	0.017877	0.065-0.139	0.068525	(0.030-0.107)	2.588193
Illinois	2006	0.017261	0.005493	0.009-0.033	0.033289	0.009680	0.019-0.060	0.016028	(-0.006-0.38)	0.928567
	2007	0.013699	0.004843	0.007-0.028	0.043381	0.010349	0.027-0.070	0.029682	(-0.007-0.052)	2.166727
	2008	0.014880	0.005090	0.008-0.029	0.044180	0.008982	0.029-0.066	0.029300	(0.009-0.050)	1.969086
Indiana	2006	0.015365	0.005552	0.008-0.031	0.027934	0.007727	0.016-0.048	0.012569	(-0.006-0.031)	0.818028
	2007	0.014142	0.005913	0.006-0.032	0.026185	0.007882	0.014-0.048	0.012043	(-0.007-0.031)	0.851577
	2008	0.011448	0.004994	0.005-0.026	0.020360	0.005619	0.012-0.035	0.008912	(-0.006-0.024)	0.778477
Iowa	2006	0.023646	0.009512	0.011-0.052	0.028714	0.010392	0.014-0.058	0.005068	(-0.023-0.033)	0.214328
	2007	0.013642	0.006926	0.005-0.036	0.027284	0.009345	0.014-0.053	0.013642	(-0.009-0.036)	1.000000
	2008	0.024632	0.009606	0.012-0.053	0.027161	0.011718	0.012-0.063	0.002529	(-0.027-0.032)	0.102671
Kentucky	2006	0.027907	0.006449	0.018-0.044	0.024175	0.006500	0.014-0.041	-0.003732	(-0.022-0.014)	-0.133730
	2007	0.021409	0.007082	0.011-0.044	0.032169	0.005868	0.022-0.046	0.010760	(-0.007-0.029)	0.502592
	2008	0.023927	0.006748	0.014-0.042	0.028938	0.006765	0.018-0.046	0.005011	(-0.014-0.024)	0.209429
Mississippi	2006	0.018911	0.005101	0.011-0.032	0.052737	0.008142	0.039-0.072	0.033826	(0.015-0.053)	1.788694
	2007	0.015313	0.005071	0.008-0.029	0.034181	0.008188	0.021-0.055	0.018868	(-0.001-0.038)	1.232156
	2008	0.016844	0.004883	0.010-0.030	0.056736	0.011104	0.038-0.084	0.039892	(0.016-0.064)	2.368321
Missouri	2006	0.018297	0.002413	0.014-0.024	0.031836	0.003806	0.025-0.40	0.013539	(0.005-0.022)	0.739957
	2007	0.013457	0.002135	0.010-0.018	0.023840	0.003479	0.018-0.032	0.010383	(0.002-0.018)	0.771569
	2008	0.010943	0.001930	0.008-0.016	0.019908	0.003290	0.014-0.028	0.008965	(0.002-0.016)	0.819245
North Carolina	2006	0.006352	0.001911	0.004-0.012	0.016905	0.004273	0.010-0.028	0.010553	(0.001-0.020)	1.661241
	2007	0.003970	0.001498	0.002-0.008	0.016905	0.005332	0.009-0.031	0.012935	(0.002-0.024)	3.257972
	2008	0.003970	0.001386	0.002-0.008	0.018772	0.006223	0.010-0.036	0.014802	(0.002-0.027)	3.728225
Ohio	2006	0.007449	0.002827	0.004-0.016	0.005568	0.001900	0.003-0.011	-0.001882	(-0.009-0.005)	-0.252614
	2007	0.003974	0.001984	0.002-0.010	0.003255	0.001680	0.001-0.009	-0.000719	(-0.006-0.004)	-0.180814
	2008	0.002767	0.001497	0.001-0.007	0.001353	0.000800	0.001-0.004	-0.001414	(-0.005-0.002)	-0.510861
South Carolina	2006	0.016175	0.006997	0.007-0.037	0.075552	0.020254	0.045-0.128	0.059377	(0.017-0.101)	3.670912
	2007	0.025611	0.007926	0.014-0.047	0.077395	0.017970	0.049-0.122	0.051784	(0.013-0.090)	2.021944
	2008	0.017951	0.006445	0.009-0.036	0.077395	0.017616	0.049-0.121	0.059444	(0.023-0.096)	3.311459

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		Density (males/ha)								
		Control	SE	95% CI	CP33	SE	95% CI	Effect Size	95% CI (ES)	Relative ES
Tennessee	2006	0.010702	0.004400	0.005-0.024	0.024080	0.005678	0.015-0.038	0.013378	(-0.001-0.027)	1.250047
	2007	0.010492	0.004831	0.004-0.026	0.022034	0.006067	0.013-0.038	0.011542	(-0.003-0.027)	1.100076
	2008	0.008394	0.003536	0.004-0.019	0.021212	0.005403	0.013-0.035	0.012818	(0.0002-0.026)	1.527073
Texas	2006	0.306850	0.081328	0.183-0.514	0.364230	0.085025	0.231-0.574	0.057380	(-0.173-0.288)	0.186997
	2007	0.255580	0.046883	0.178-0.367	0.263540	0.044773	0.189-0.368	0.007960	(-0.119-0.135)	0.031145
	2008	0.173370	0.030456	0.122-0.246	0.309180	0.067808	0.201-0.475	0.135810	(-0.010-0.282)	0.783354

		Density (coveys/ha) adjusted for calling rate					
		Control	95% BootstrapCI	CP33	95% BootstrapCI	Effect Size	Relative ES
19-CMP	2006	0.456312	0.395-0.515	0.156783	0.131-0.184	-0.299529	-0.656413
	2007	0.439944	0.360-0.512	0.390912	0.320-0.460	-0.049032	-0.111450
	2008	0.261976	0.231-0.293	0.456312	0.395-0.515	0.194337	0.741812
22-ETP	2006	0.031294	0.025-0.038	0.042376	0.035-0.050	0.011083	0.354154
	2007	0.024726	0.019-0.031	0.037679	0.030-0.045	0.012953	0.523847
	2008	0.024199	0.019-0.030	0.034555	0.028-0.042	0.010355	0.427905
24-CH	2006	0.044722	0.034-0.055	0.062494	0.047-0.079	0.017772	0.397382
	2007	0.029929	0.022-0.039	0.060579	0.048-0.074	0.030650	1.024099
	2008	0.031782	0.023-0.040	0.059708	0.044-0.078	0.027927	0.878707
26-MAV	2006	0.012854	0.006-0.020	0.033412	0.022-0.045	0.020558	1.599371
	2007	0.010985	0.005-0.018	0.026145	0.013-0.041	0.015160	1.380101
	2008	0.010530	0.003-0.019	0.025593	0.013-0.039	0.015062	1.430364
27-SCP	2006	0.027521	0.021-0.034	0.080583	0.068-0.093	0.053062	1.928057
	2007	0.025896	0.020-0.032	0.069191	0.0.58-0.081	0.043296	1.671928
	2008	0.027167	0.022-0.034	0.073974	0.062-0.085	0.046807	1.722972
Overall	2006	0.054076	0.048-0.060	0.075002	0.068-0.082	0.020926	0.386979
	2007	0.055592	0.048-0.063	0.092508	0.084-0.102	0.036916	0.664057
	2008	0.039404	0.034-0.045	0.060869	0.054-0.068	0.021465	0.544753

BCR and state-level density estimates (coveys/ha), standard error, 95% confidence intervals, and simple effect size, 95% confidence intervals for effect size, and relative effect size for non-adjusted bobwhite coveys on surveyed CP33 and control fields during the fall of 2006-2008, and BCR and state-level density estimates, 95% bootstrap confidence intervals, and simple and relative effect size for bobwhite coveys adjusted for calling rate (includes: number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004)) (continued).

		Density (coveys/ha) adjusted for calling rate					
		Control	95% BootstrapCI	CP33	95% BootstrapCI	Effect Size	Relative ES
Arkansas	2006	0.022542	0.005-0.042	0.044366	0.024-0.068	0.021825	0.968201
	2007	0.024147	0.007-0.044	0.036442	0.012-0.067	0.012295	0.509147
	2008	0.011768	0.000-0.026	0.019683	0.005-0.042	0.007914	0.672518
Georgia	2006	0.053185	0.031-0.077	0.109177	0.075-0.145	0.055993	1.052798
	2007	0.037962	0.021-0.057	0.093657	0.063-0.126	0.055694	1.467095
	2008	0.049294	0.027-0.073	0.160152	0.128-0.194	0.110858	2.248899
Illinois	2006	0.030908	0.016-0.046	0.050566	0.031-0.070	0.019658	0.636025
	2007	0.028397	0.013-0.045	0.068057	0.046-0.091	0.039660	1.396614
	2008	0.02799	0.014-0.044	0.070107	0.052-0.089	0.042120	1.505012
Indiana	2006	0.02565	0.016-0.037	0.042847	0.027-0.061	0.017201	0.670724
	2007	0.026102	0.013-0.041	0.038699	0.022-0.057	0.012597	0.482595
	2008	0.020488	0.009-0.033	0.036599	0.022-0.052	0.016110	0.786311
Iowa	2006	0.042200	0.019-0.069	0.047280	0.023-0.075	0.005080	0.120384
	2007	0.022109	0.007-0.040	0.044682	0.024-0.067	0.022572	1.020958
	2008	0.041133	0.019-0.066	0.042516	0.016-0.071	0.001383	0.033624
Kentucky	2006	0.04594	0.032-0.061	0.038194	0.025-0.053	-0.007743	-0.168565
	2007	0.03349	0.019-0.050	0.055808	0.043-0.068	0.022321	0.666570
	2008	0.03868	0.024-0.055	0.046451	0.032-0.063	0.007772	0.200931
Mississippi	2006	0.03184	0.020-0.044	0.085319	0.069-0.102	0.053479	1.679602
	2007	0.02414	0.013-0.037	0.053791	0.036-0.075	0.029651	1.228340
	2008	0.02943	0.019-0.040	0.107771	0.083-0.134	0.078345	2.662470
Missouri	2006	0.02634	0.022-0.031	0.045208	0.038-0.052	0.018873	0.716662
	2007	0.02747	0.017-0.042	0.036757	0.029-0.044	0.009289	0.338150
	2008	0.01819	0.014-0.023	0.033012	0.026-0.040	0.014825	0.815189
North Carolina	2006	0.011616	0.007-0.017	0.030304	0.020-0.041	0.018688	1.608733
	2007	0.00847	0.004-0.013	0.029528	0.017-0.042	0.021059	2.486657
	2008	0.00686	0.003-0.011	0.034964	0.019-0.051	0.028104	4.097202
Ohio	2006	0.01388	0.007-0.021	0.012115	0.006-0.019	-0.001769	-0.127401
	2007	0.00708	0.003-0.012	0.005675	0.002-0.010	-0.001406	-0.198551
	2008	0.00482	0.002-0.009	0.004234	0.001-0.009	-0.000586	-0.121566
South Carolina	2006	0.0448	0.024-0.067	0.167066	0.112-0.231	0.122265	2.729017
	2007	0.051	0.031-0.073	0.145834	0.097-0.201	0.094838	1.859729
	2008	0.03317	0.017-0.050	0.107805	0.071-0.147	0.074635	2.250013

BCR and state-level density estimates (coveys/ha), standard error, 95% confidence intervals, and simple effect size, 95% confidence intervals for effect size, and relative effect size for non-adjusted bobwhite coveys on surveyed CP33 and control fields during the fall of 2006-2008, and BCR and state-level density estimates, 95% bootstrap confidence intervals, and simple and relative effect size for bobwhite coveys adjusted for calling rate (includes: number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004)) (continued).

		Density (coveys/ha) adjusted for calling rate					
		Control	95% BootstrapCI	CP33	95% BootstrapCI	Effect Size	Relative ES
Tennessee	2006	0.01933	0.007-0.033	0.050620	0.035-0.068	0.031292	1.619027
	2007	0.01821	0.008-0.031	0.037329	0.023-0.051	0.019119	1.049909
	2008	0.01433	0.006-0.024	0.040762	0.027-0.054	0.026436	1.845424
Texas	2006	0.456312	0.395-0.515	0.156783	0.131-0.184	-0.299529	-0.656413
	2007	0.439944	0.360-0.512	0.390912	0.320-0.460	-0.049032	-0.111450
	2008	0.261976	0.231-0.293	0.456312	0.395-0.515	0.194337	0.741812

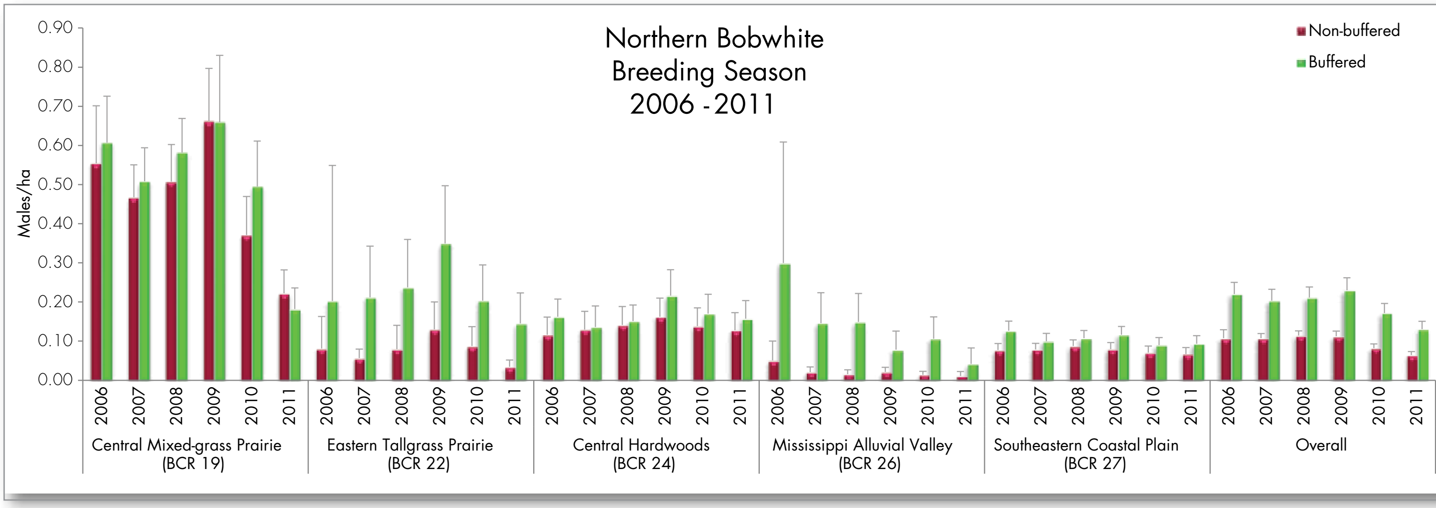

Figure 5. Breeding season bobwhite density estimates (males/ha ± 95% CI) on row-crop fields buffered with CP33 vs. non- buffered fields in the Central Mixed-grass Prairie, Eastern Tallgrass Prairie, Central Hardwoods, Mississippi Alluvial Valley, and Southeastern Coastal Plain Bird Conservation Regions (BCR) (2006-2011). Data from all survey sites (including those in peripheral BCRs) were included in overall density estimates.

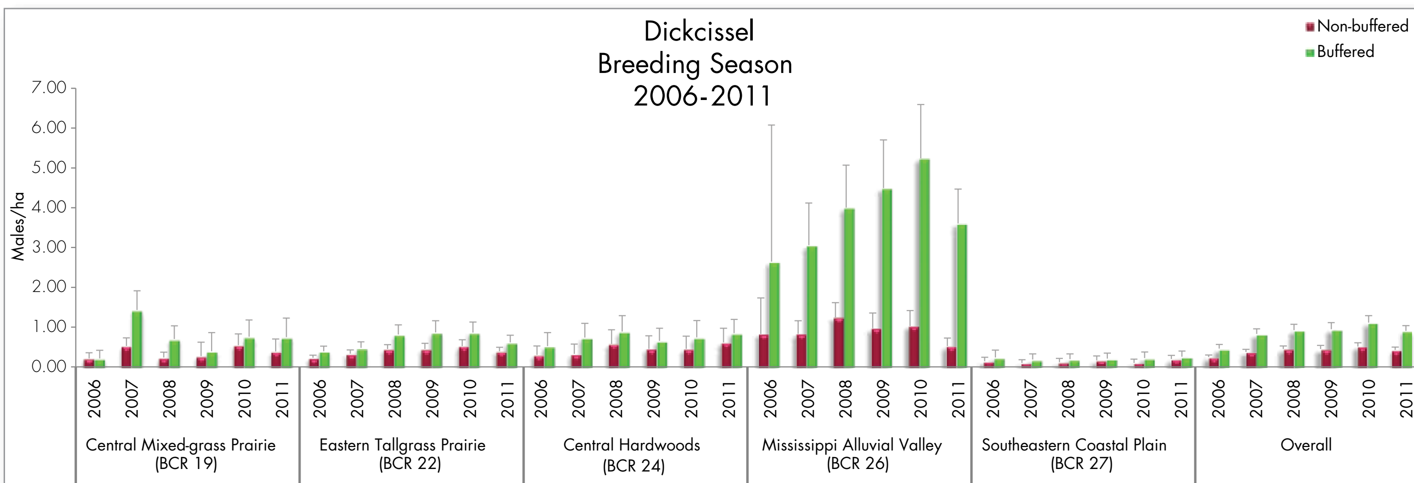

Figure 6. BCR-level and overall breeding season dickcissel density (males/ha) on surveyed CP33 buffered and non-buffered row-crop fields from 2006-2011. Data from all survey sites were included in the overall density estimate. Survey sites in GA, NC, and SC were excluded from analyses as sites in these states are effectively out of the dickcissel range. Error bars represent 95% confidence intervals.

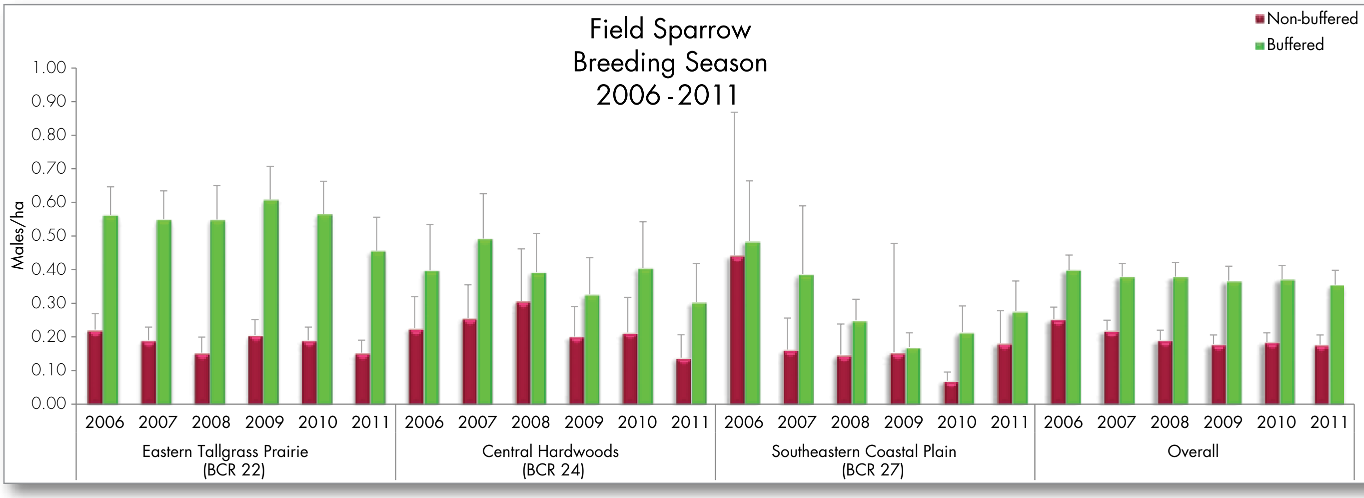

Figure 7. BCR-level and overall breeding season field sparrow density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. The Central Mixed-grass Prairie region (BCR 19) was not evaluated as the majority of survey sites are in TX which is effectively out of the field sparrow range; data from the remaining survey sites were included in the overall density estimate. Error bars represent 95% confidence intervals.

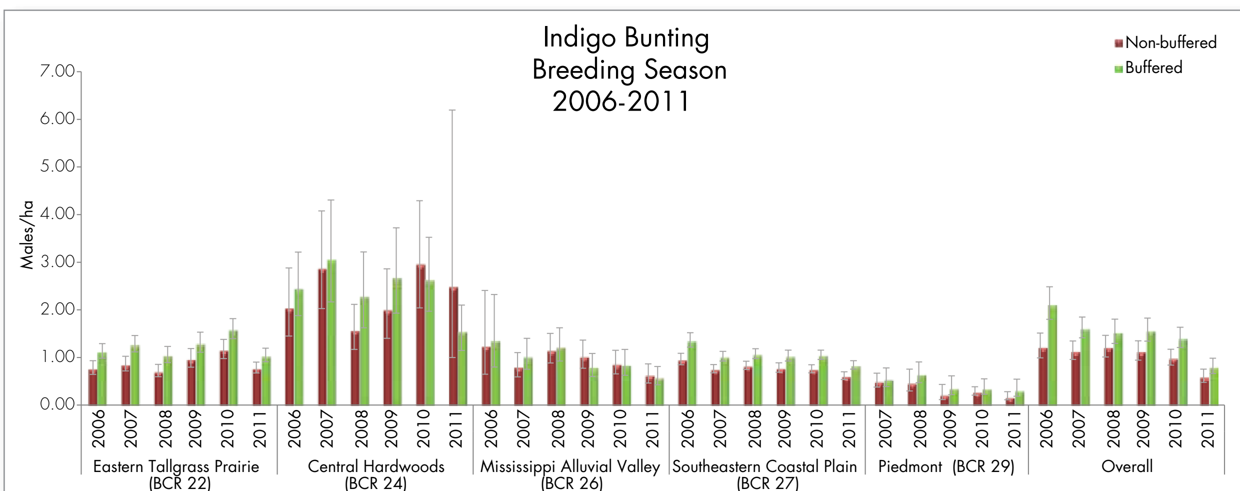

Figure 8. BCR-level and overall breeding season indigo bunting density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. The Central Mixed-grass Prairie (BCR 19) was not evaluated as the majority of survey sites are in TX which is effectively out of the indigo bunting range; data from the remaining survey sites were included in the overall density estimate. Error bars represent 95% confidence intervals.

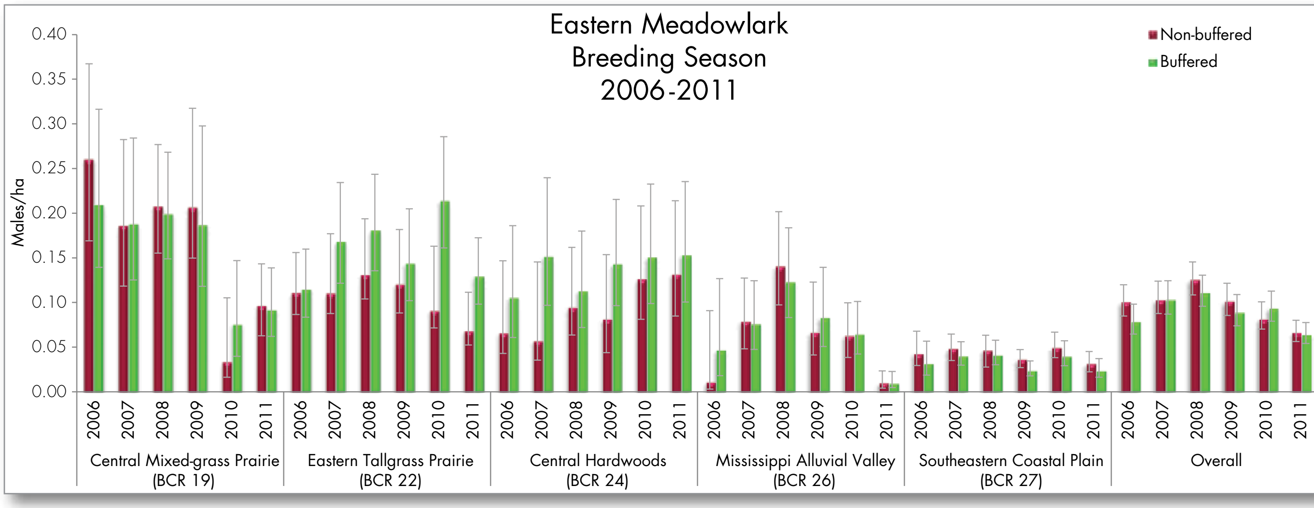

Figure 9. BCR-level and overall breeding season eastern meadowlark density (males/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2011. Data from all BCR's are included in the overall density estimate. Error bars represent 95% confidence intervals.

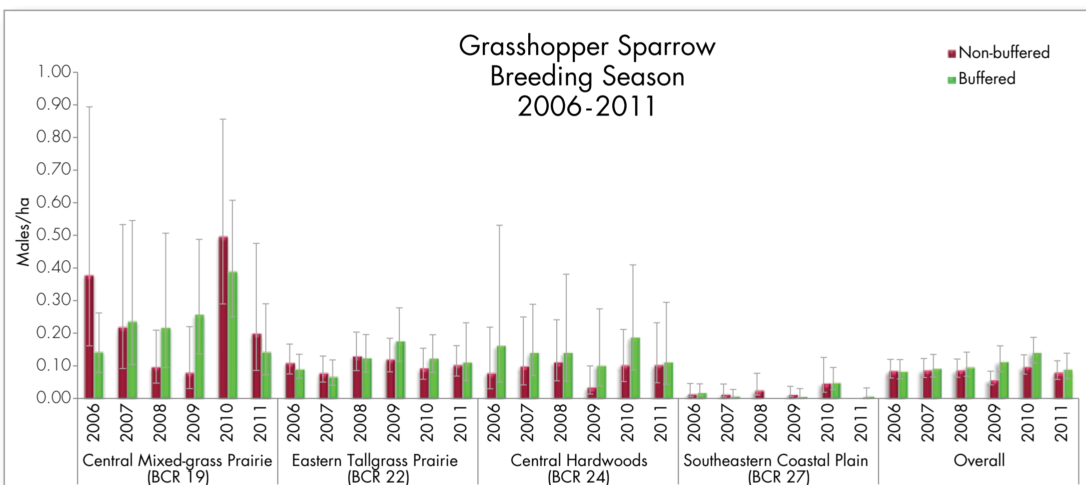

Figure 10. BCR-level and overall breeding season grasshopper sparrow density (males/ha) on surveyed CP33 buffered and non-buffered fields 2006-2011. Error bars represent 95% confidence intervals.

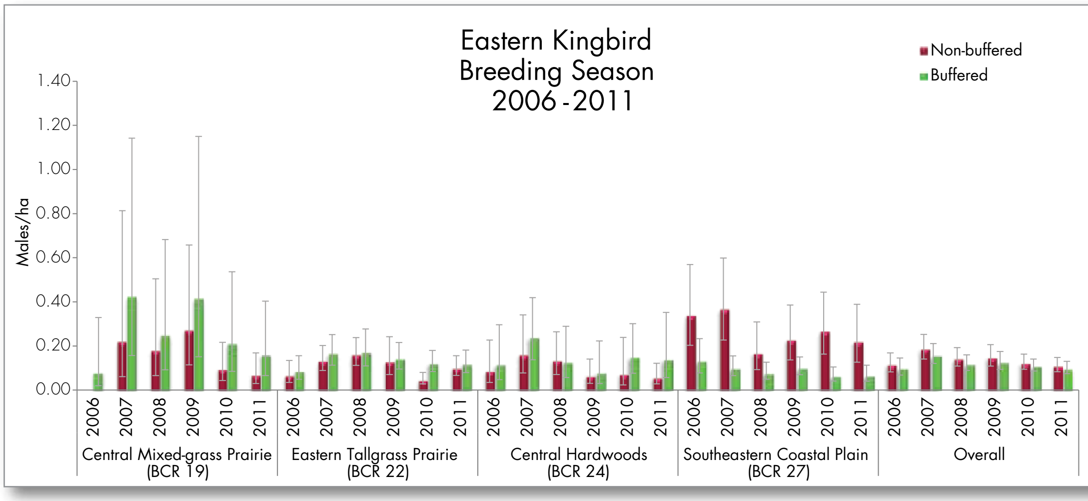

Figure 11. BCR-level and overall breeding season eastern kingbird density (males/ha) on surveyed CP33 buffered and non-buffered fields 2006-2011. Error bars represent 95% confidence intervals.

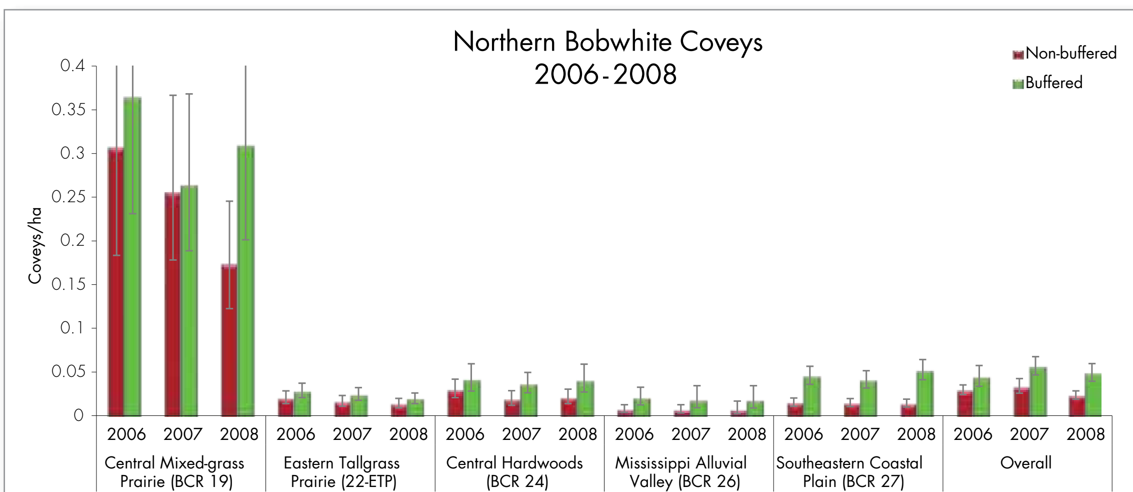

Figure 17. BCR-level and overall non-adjusted northern bobwhite covey density (coveys/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2008. Data from all BCR's are included in the overall density estimate. Error bars represent 95% confidence intervals.

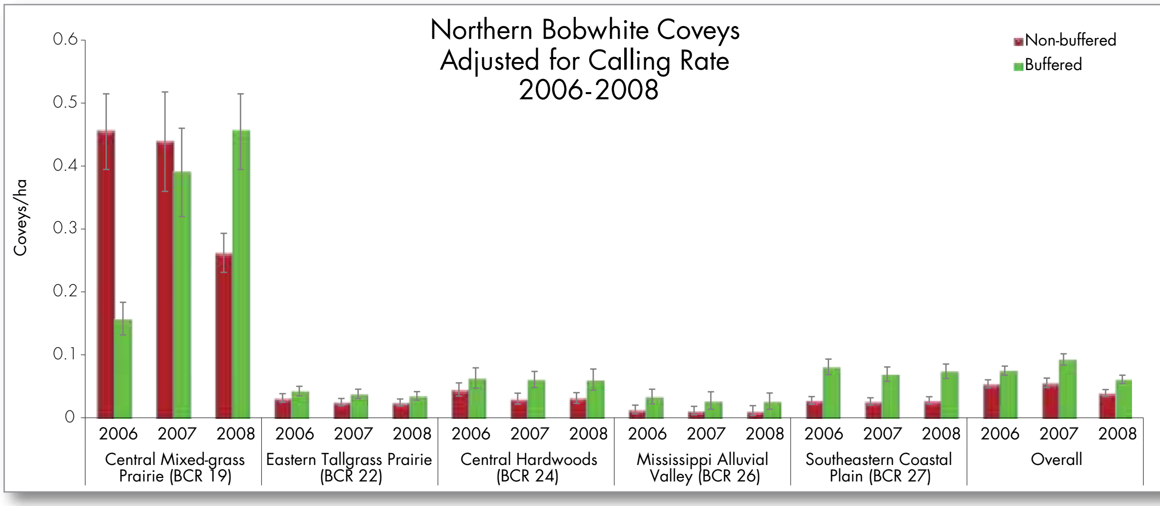

Figure 18. BCR-level and overall northern bobwhite covey density estimates (coveys/ha) on surveyed CP33 buffered and non-buffered fields adjusted for number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004). Data from all BCRs are included in the overall density estimate. Error bars represent 95% confidence intervals.

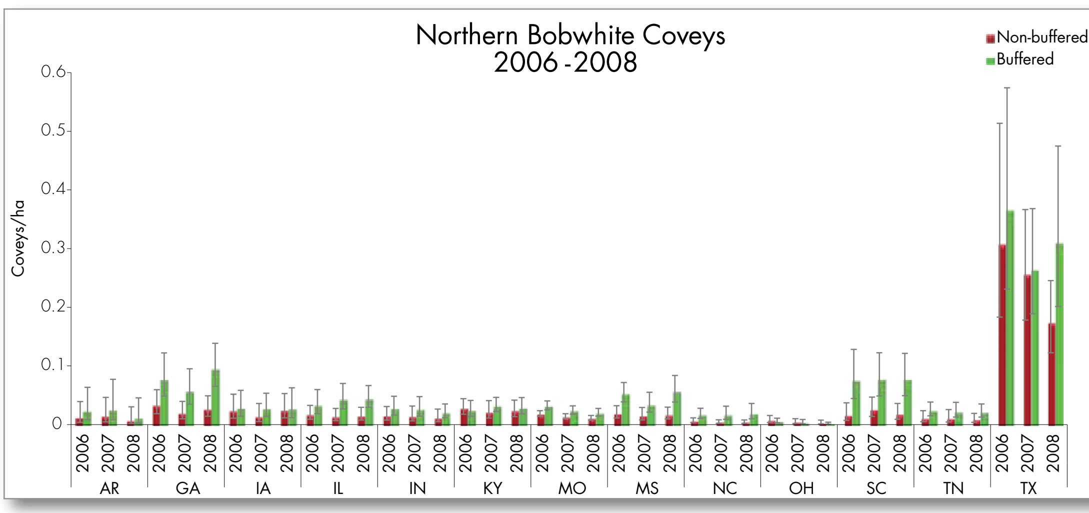

Figure 19. State-level non-adjusted northern bobwhite covey density (coveys/ha) on surveyed CP33 buffered and non-buffered fields from 2006-2008. Error bars represent 95% confidence intervals.

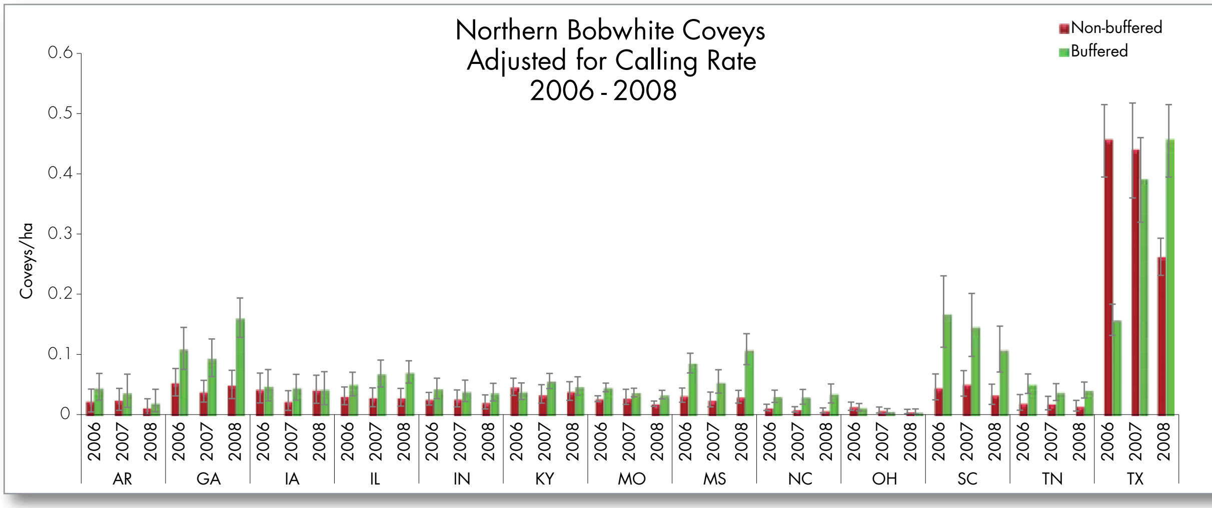

Figure 20. State-level northern bobwhite covey density estimates (coveys/ha) on surveyed CP33 buffered and non-buffered fields adjusted for number of adjacent calling coveys, % cloud cover, wind speed, and 6-hr change in barometric pressure (Wellendorf et al. 2004). Error bars represent 95% confidence intervals.

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