Wintering Grassland Bird Densities in Chihuahuan Desert Grassland Priority Conservation Areas, 2007-2011

Rocky Mountain Bird Observatory
PO Box 1232
Brighton, CO 80601
303.659.4348
www.rmbo.org
Tech. Report # I-NEOTROP-MXPLAT-10-2

Rocky Mountain Bird Observatory

Mission: To conserve birds and their habitats

Vision: Native bird populations are sustained in healthy ecosystems

Core Values: (Our goals for achieving our mission)

1. **Science** provides the foundation for effective bird conservation.
2. **Education** is critical to the success of bird conservation.
3. **Stewardship** of birds and their habitats is a shared responsibility.

RMBO accomplishes its mission by:

- **Monitoring** long-term bird population trends to provide a scientific foundation for conservation action.
- **Researching** bird ecology and population response to anthropogenic and natural processes to evaluate and adjust management and conservation strategies using the best available science.
- **Educating** people of all ages through active, experiential programs that create an awareness and appreciation for birds.
- **Fostering** good stewardship on private and public lands through voluntary, cooperative partnerships that create win-win situations for wildlife and people.
- **Partnering** with state and federal natural resource agencies, private citizens, schools, universities, and other non-governmental organizations to build synergy and consensus for bird conservation.
- **Sharing** the latest information on bird populations, land management and conservation practices to create informed publics.
- **Delivering** bird conservation at biologically relevant scales by working across political and jurisdictional boundaries in western North America.

Suggested Citation:

Macias-Duarte, A., A. O. Panjabi, D. Pool, Erin Youngberg and Greg Levandoski. 2011. Wintering Grassland Bird Density in Chihuahuan Desert Grassland Priority Conservation Areas, 2007-2011. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report I-NEOTROP-MXPLAT-10-2. 164 pp.

Cover Photo: Chihuahuan Desert grasslands near Tosesihua mountain (municipality of Coyame) in the Valles Centrales Grassland Priority Conservation Area in central Chihuahua. Photo by Alberto Macías-Duarte.

Contact Information:

Alberto Macías-Duarte alberto.macias@rmbo.org
Arvind Panjabi arvind.panjabi@rmbo.org
Gregory Levandoski greg.levandoski@rmbo.org
Rocky Mountain Bird Observatory
PO Box 1232
Brighton, CO 80601
303-659-4348

Acknowledgements

This project was made possible through financial support provided by the US Fish and Wildlife Service (USFWS) through the Neotropical Migratory Bird Conservation Act, the USDA Forest Service International Programs, The National Fish and Wildlife Foundation (NFWF), The Nature Conservancy (TNC), the Commission for Environmental Cooperation (CEC), the USDA Rio Grande Research Center at Sul Ross State University, the Sonoran Joint Venture (SJV), Texas Parks and Wildlife Department State Wildlife Grant T8, and the Bureau of Land Management (BLM). The content and opinions expressed herein are those of the author(s) and do not necessarily reflect the position or the policy of the USFWS, USDA, NFWF, TNC, CEC, TPWD, BLM or the SJV, and no official endorsement should be inferred.

Implementation of this project was made possible by the Facultad de Ciencias of the Universidad Autónoma de Nuevo León (UANL), which assembled field crews, conducted many of the surveys, and handled logistics in Mexico. We thank the City of Fort Collins, Colorado for providing matching funds in support of 4 major NMBCA awards given to this project. We are grateful to TNC for the generous use of their field station at the Reserva Ecológica "El Uno" near Janos, Chihuahua for our field training and operations. We are also thankful for the support and participation of partner organizations in implementing field surveys, including UANL, the Universidad Juárez del Estado de Durango, Profauna Coahuila, TNC, Pronatura Noreste, Pronatura Noroeste, Profauna Chihuahua, Biodiversidad y Desarrollo Armónico (BIDA) and Naturalia, the latter of whom also provided logistical support in Sonora.

The authors are especially grateful to José Ignacio González Rojas and Irene Ruvalcaba Ortega for their invaluable assistance in coordinating and implementing this effort. We thank Antonio Esquer, Nélida Barajas and the staff at the Reserva Ecológica El Uno for their generous hospitality and use of their facilities which provide an ideal situation for field training. We also thank Eduardo López Saavedra and Daniel Toyos for their hospitality, assistance with navigation and contacting landowners, and use of the Rancho Los Fresnos as a home base while working in Sonora. We thank Bonnie Warnock for her assistance in securing funding for this work in west Texas and with securing access to private lands in the region. We thank Jennifer Blakesley and David Hanni for their help in designing this project. We thank Chandman Sambuu and Michael Smith for development and improvement of the data entry website. We thank Valer Austin, Carol Beardmore, David Black, Lisa Brooke McDonough, Jim Chu, Steve Dobrott, Cori Dolan, Daylan Figgs, Guy Foulks, Jim Garrett, Andrea Grosse, Mary Gustafson, Tom Hammond, Paul Juergens, Christina Kakoyannis, Linda Kennedy, Raymond Lister, Carol Lively, Brian Locke, Brian Martin, Bob McCready, Timothy Male, David Mehlman, Robert Mesta, Angel Montoya, Daniel Petit, Karen Richardson, Mike Rizo, Doug Ryan, Karen Simms, John Stokes, Sheridan Stone, Cindy Tolle, Carly Vynne, Tom Wadell, Geoff Walsh, Bonnie Warnock and Rawles Williams for their support of this project. We thank Jurgen Hoth for helping to generate interest among Mexican partners for this effort. We thank the many members of our field crews: Adriana Núñez Gonzalí, Aixa Bujduj León, Alicia Zarate Martinez, Andrew Tillinghast, Angel Medina Lira, Armando Jimenez Camacho, Brady Wallace Surver, Carly Lapin, Chris Pipes, Ciel A. Evans, Cole Wild, Daniel Sierra Franco, Daniel Toyos, David Pavlik, Edhy Francisco Alvarez Garcia, Eduardo Sígala Chávez, Emily

Strelow, Enrique Carreon Hernández, Fernando Solis Carlos, Gabriel Valencia Ortega, Garrett MacDonald, Greg J. Levandoski, Gustavo Fernandez de los Santos, Hugo Enrique Elizondo, Irene Ruvalcaba Ortega, Jamie Hogberg, Juan Manuel Cardenas Villanueva, Javier Lombard Romero, Javier Saúl Garcia, Jesus Salazar Ortiz, Jorge Allen Bobadilla, Jorge Carranza, Jose Hugo Martinez Guerrero, Jose Juan Butrón Rodriguez, Jose Juan Flores Maldonado, Jose Luis Garcia, Jose Roberto Rodriguez Salazar, Juan Francisco Maciel Nájera, Lucas J. Foerster, Mario Alberto Guerrero Madriles, Mario de Jesus Castillo Varela, Martin Emilio Pereda Solis, Miguel Angel Grageda, Nancy Hernández Rodriguez, Nereyda Cruz Maldonado, Pedro Angel Calderon Dominguez, Quick Yeates-Burghart, Rafael Humberto Cardenas Olivier, Ricardo Guzman Olachea, Silvia Alejandra Chavarría Rocha, Simón Octavio Valdez and Teresita de Jesus Lasso Lopez. Finally, we extend our gratitude to the many landowners in Mexico and the U.S. who generously allowed access to their lands for field surveys and shared local knowledge that increased logistical efficiency.
.

Executive Summary

Many North American grassland bird species are undergoing steep, widespread and long-term population declines, likely due to the continued habitat loss and degradation over much of their range. More than 80% of grassland bird species breeding in western North America overwinter in the Chihuahuan Desert grasslands of the southwestern United States and northern Mexico. These grasslands are increasingly being lost and degraded through agricultural conversion, desertification, and shrub encroachment, especially in Mexico. The role of threats during the wintering period in these documented population declines, although hypothesized to be important, remains unknown. In this regard, it is imperative to obtain information on wintering grassland bird distribution, abundance, habitat use and their spatiotemporal patterns to guide strategic habitat conservation in the region.

In 2007, Rocky Mountain Bird Observatory (RMBO), together with Universidad Autónoma de Nuevo Leon, initiated a first-ever, region-wide pilot survey to inventory, research, and monitor wintering birds at 468 randomly-selected grassland sites in 7 Chihuahuan Desert Grassland Priority Conservation Areas (GPCAs) in northern Mexico. We have expanded this effort every year since then to eventually include 1,159 sampling locations in 16 GPCAs in northern Mexico, southeastern Arizona, southern New Mexico and west Texas in 2011.

We surveyed birds at each sampling location using 1-km line transects with distance sampling to estimate bird density. We also characterized habitat structure using ocular estimates. These surveys generated data on habitat conditions and abundance of 50 grassland obligate or facultative species in the 16 GPCAs, including 29 priority species of high regional or continental conservation interest. We used Bayesian hierarchical models to obtain reasonably precise annual estimates of population density for 29 species, including 18 priority species.

Wintering grassland bird communities throughout the Chihuahuan Desert are highly variable in species abundance and composition from winter to winter. Bird densities may change in orders of magnitude at the GPCA level and bird species may reach their maximum density at different GPCAs in different years. Chihuahuan Desert grassland winter avifaunal densities are characterized by the dominance of a few species including Chestnut-collared Longspur, Lark Bunting, Vesper Sparrow, Horned Lark, Brewer Sparrow, and Savannah Sparrow. In addition, a cluster analysis of GPCAs based on bird species composition shows geographically consistent groups of GPCAs suggesting a regionalization or geographic units of grassland bird species' occurrence within the Chihuahuan Desert. Analysis of biodiversity measures, mainly species richness and the Shannon-Weaver diversity index suggest that Cuchillas de la Zarca, Janos, and Malpaís harbor highly diverse grassland bird communities and should be effectively protected.

Information on bird abundance and distribution generated by this project is providing valuable information to generate demographic projections and habitat models during the winter season. These tools will inform agencies and land managers on the conditions necessary to achieve target population levels of grassland bird species to ensure their long-term conservation.

Resumen Ejecutivo

Muchas especies de aves de pastizal de Norteamérica están sufriendo fuertes descensos poblacionales, probablemente debido a la pérdida y la degradación de sus hábitats en la mayor parte de su área de distribución. Más del 80% de las especies de aves de pastizal en el oeste de Norteamérica pasan el invierno en los pastizales del Desierto Chihuahuense del suroeste de Estados Unidos y el norte de México. Estos pastizales se pierden y se deterioran día a día por su conversión a tierras de cultivo, la desertificación y la invasión de arbustivas. El papel de las amenazas que enfrentan las aves de pastizal durante el invierno en estas disminuciones poblacionales, aunque se cree importante, sigue siendo desconocido. En este sentido, es imprescindible obtener información sobre la distribución, abundancia, uso de hábitat de las aves de pastizal y sus patrones espacio-temporales durante el invierno para guiar la conservación estratégica de hábitats en la región.

Rocky Mountain Bird Observatory (RMBO), junto con la Universidad Autónoma de Nuevo León, inició en 2007 el primer estudio piloto regional para el inventario, la investigación y el monitoreo de aves durante el invierno en 468 sitios de pastizal seleccionados aleatoriamente en 7 Áreas Prioritarias para la Conservación de los Pastizales (APCP) del Desierto Chihuahuense en el norte de México. Hemos expandido este esfuerzo cada año desde entonces para incluir finalmente 1,159 puntos de muestreo en 16 APCPs en el norte de México, sureste de Arizona, sur de Nuevo México y el oeste de Texas en 2011.

Realizamos conteos de aves a través de transectos lineales de 1 km en cada uno de los sitios de muestreo con muestreo de distancia para estimar la densidad de aves. También caracterizamos la estructura del hábitat utilizando estimaciones oculares. Estos transectos generaron datos sobre las condiciones del hábitat y la abundancia de 50 especies de pastizal obligadas y facultativas en las 16 APCPs, incluyendo 29 especies prioritarias de interés de conservación regional y continental. Utilizamos modelos jerárquicos bayesianos para obtener estimaciones anuales razonablemente precisas de la densidad poblacional de 29 especies, incluyendo 18 especies prioritarias.

Las comunidades de aves de pastizal en el invierno en el Desierto Chihuahuense son muy variables en abundancia y composición de especies de invierno a invierno. La densidad de aves puede cambiar en varios órdenes de magnitud a nivel de APCP y las especies de aves pueden alcanzar su máxima densidad en APCPs diferentes en años diferentes. La avifauna de invierno en los pastizales del Desierto Chihuahuense se caracteriza por el predominio de algunas especies como el Escribano de Collar Castaño, el Gorrión Ala Blanca, el Gorrión Ala Blanca, la Alondra Cornuda, y el Gorrión de Brewer. Además, un análisis de conglomerados de APCPs basado en la composición de especies muestra a grupos de APCPs geográficamente coherentes lo que sugiere una regionalización o la existencia de unidades geográficas de ocurrencia de especies de aves de pastizal en el Desierto Chihuahuense. Un análisis de la riqueza de especies y del índice de diversidad de Shannon-Weaver sugiere que Cuchillas de la Zarca, Janos y Malpaís mantienen una comunidad de aves muy diversa y que deben ser protegidas con eficacia.

La información sobre la abundancia y de distribución de aves generada por este proyecto está proporcionando información valiosa para generar proyecciones demográficas y modelos de hábitat durante la temporada de invierno. Estas herramientas permitirán a las agencias y administradores de la tierra alcanzar niveles poblacionales objetivo de especies de aves de pastizal para asegurar su conservación a largo plazo.

Table of Contents

Introduction

Grasslands are one of the most threatened ecosystems on Earth. Nowhere in the world have grasslands been decimated as in North America, where less than 4% of tallgrass prairie remain after 2 centuries of colonization (Samson and Knopf 1994). Even in the remaining tracts of native prairies, breeding populations of many grassland bird species, including 29 species of continental or regional importance for Partners in Flight (PIF) and/or the U.S. Fish and Wildlife Service (USFWS), are undergoing steep, widespread and long-term population declines (Sauer et al. 2008). Reasons for these recent documented declines are still poorly understood, but likely relate to the on-going habitat loss and degradation of the remaining grasslands. In this regard, threats to native grasslands are accelerating in many regions due to expanding agriculture, urbanization, oil exploration, desertification and invasive species. However, the potential role of threats during the winter in these population declines, although hypothesized to be important, remains unknown.

The western Great Plains, from southern Alberta and Saskatchewan to southern New Mexico and western Texas, have the most extensive and intact native grasslands remaining in North America and support the most important breeding areas for the greatest number of grassland bird species. Ninety percent of grassland-associated (obligate and facultative) bird species breeding in the western Great Plains are migratory, and more than 80% of these overwinter in the Chihuahuan Desert of northern Mexico and the southwestern United States, making this a continentally-important region for grassland birds. This strong dependence to Chihuahuan Desert grasslands of northern Mexico make North American grassland birds highly vulnerable to anthropogenic changes in the region considering the relatively limited extent of these grasslands. Native grasslands in the Chihuahuan Desert are restricted in distribution, and while the current GIS (INEGI 2003) suggest that grasslands occupy roughly 15% of the Chihuahuan Desert (Bird Conservation Region 35) in Mexico, resolution among grassland condition is poor, and the actual extent of open, relatively shrub-free grasslands that are required by most grassland-obligate bird species is much less than 15% and probably closer to around 5%.

In spite of the importance of Chihuahuan Desert grasslands for North American grassland bird conservation, little information exists to guide their conservation in the region. Information on the regional distribution, abundance, habitat use and spatio-temporal patterns of wintering grassland birds and on trends in grassland extent and condition is urgently needed to advance strategic conservation actions for priority species while opportunities still exist. The goal of this project is to provide regional winter population density estimates of grassland bird species throughout the Chihuahuan Desert through a random-sampling design. This goal was outlined as one of the research priorities identified at the 3rd International Symposium on Grasslands that took place in Chihuahua City in August of 2006. Since then, RMBO has conducted avian surveys throughout the Chihuahuan Desert grassland every winter. Our focus is to estimate abundance of grassland birds in Grassland Priority Conservation Areas (GPCAs), emphasizing priority species as identified by the federal governments of Canada, the U.S. or Mexico, or by major bird conservation initiatives such as Partners in Flight, The U.S. Shorebird Conservation Plan and The Nature Conservancy. Preliminary results have released crucial information on

wintering grassland birds through a series of technical reports (Panjabi et al. 2007, Levandoski et al. 2009, and Panjabi et al. 2010a and 2010b). This current report updates the information on grassland bird abundance and distribution through the winter of 2011 and uses a new analytical approach. Information on grassland bird abundance and distribution among GPCAs will allow the prioritization of areas for species- and ecosystem-focused conservation efforts, and provide insights into species-specific habitat requirements and management recommendations. Furthermore, this information will also enable evaluation of impacts from continuing grassland loss and climate change, as well as conservation actions, in the Chihuahuan Desert.

Methods

Study area

We conducted avian and habitat surveys in up to 16 Grassland Priority Conservation Areas (CEC and TNC 2005, Pool and Panjabi 2010) in northern Mexico, southern Arizona, southern New Mexico and western Texas in the winters of 2007 through 2011 (Levandoski et al. 2009, Panjabi et al. 2010). GPCAs included in this study are Armendaris, Cuatro Ciénegas, Cuchillas de la Zarca, Janos, Lagunas del Este, Llano Las Amapolas, Malpaís, Mapimí, Marfa, New Mexico Bootheel, Otero Mesa, Sonoita, Sulphur Springs, El Tokio, Valles Centrales, and Valle Colombia (Figure 1).

Focal species

We used the classification of grassland obligate and facultative bird species by Vickery et al. (1999) as a starting point to determine "grassland-associated" status among bird species detected on our surveys, but with some modifications. We did not include in our "grassland-associated species" designation any waterfowl, herons or cowbirds considered "facultative", and we considered Bald Eagle, Golden Eagle and White-tailed Kite as facultative grassland species whereas Vickery et al. (1999) did not include these on either list (scientific names are given in Appendix A). Our reasoning is that waterfowl do not inhabit arid Chihuahuan grasslands in winter, the only heron to be expected is Cattle Egret (an exotic species), and cowbirds rarely are found in arid grasslands, unless there are trees or tall shrubs present. In addition, Bald Eagles can be expected in more northerly desert grasslands in winter, especially around prairie dog towns, and Golden Eagles are a regular inhabitant of arid grasslands year-round and especially in winter. White-tailed Kites also readily utilize arid grasslands. We also made a few changes to obligate and facultative designations as assigned by Vickery et al. (1999). We did not consider American Pipit as a grassland obligate species, but rather as a facultative species, given that it is only rarely encountered in Chihuahuan Desert grasslands in winter and is more likely to occur around water bodies and barren agricultural fields. We also include Brewer's Sparrow as a grassland facultative species, as it is one of the most abundant bird species in Chihuahuan Desert grasslands (Desmond et al. 2005, Manzano-Fischer et al. 2006, Macias-Duarte et al. 2009), and its winter abundance is positively correlated with grass cover (Panjabi et al. 2010a). Finally, we consider Worthen's Sparrow to be a grassland obligate species, although it nests in shrubs and seems to require a scrubland edge, it is not found away from grasslands.

Fig. 1. Grassland Priority Conservation Areas in the Chihuahuan Desert (CEC and TNC 2005, Pool and Panjabi 2010) and wintering grassland bird sampling blocks surveyed in 2011. Green shading shows the extent of desert grasslands.

Sampling design

We overlaid a grid of roughly 18 x 18 km^2 cell blocks across the Chihuahuan Desert and Sierra Madre Oriental Bird Conservation Regions to create a sampling frame for desert grasslands within GPCAs (Fig. 1). Eligible cells for sampling were those that intersected with GPCAs and had at least 5 km of road access to grasslands as identified in the GIS (INEGI 2003). Due to poor correspondence between some GPCA boundaries and actual locations of grassland in the vicinity of these GPCAs, we added additional cell blocks to the sampling pool that met the aforementioned criteria, but were outside the original GPCA boundaries. This sampling design is described in detail by Panjabi et al. (2007), with modifications by Levandoski et al. (2009). We added additional GPCAs to the sampling frame each year. In each sampling block we established randomly numbered points at 500 m intervals along roads intersecting grasslands, and established 6 paired 1-km line transects in each block, starting at the 3 lowest numbered points that met habitat requirements for native grasslands with <25% shrub cover.

Bird surveys

We used distance sampling Buckland et al (2001) on line transects to estimate annual winter bird density in all GPCAs. We initiated surveys in early January and completed surveys by early March. Each pair of 1-kilometer line transects started from a randomly selected point along a road and headed in opposite directions perpendicular to the road. In a few instances where available grasslands were limited within the survey block, we split paired transects to start from different random points. Each pair of technicians surveyed the 6 transects in each block starting at sunrise and continuing until completion (usually before 13:00). Sometimes, due to weather, road conditions, and variability in the time needed to complete both bird and vegetation surveys, finishing all transects within 6 hours was not possible. We did not conduct surveys during winds higher than category 4 in the Beaufort scale (20-28 kph) or during any precipitation greater than a drizzle.

From each starting point, technicians used Garmin E-trex Vista GPS units to establish the end point of the transect 1000 m away and maintain their position on the line while conducting the survey. Observers used a compass to select a point on the horizon that corresponded with the direction of the transect end point, and used this bearing to visualize the transect line in front of them. Observers recorded all birds detected during each survey and used both laser rangefinders and ocular estimates to obtain lateral distances from the transect line to each bird or bird cluster detected. We trained field technicians to obtain reasonably accurate ocular estimates of lateral distance from transects before the start of each field season. Bird clusters were defined as groups of 2 or more individuals of the same species occurring within 25 m of the first individual detected. For each detection, we recorded the cluster size. If observers encountered a major obstacle (such as an international border, cliff or other impassable terrain) or if the transect would otherwise bisect a large area (>250 m) of non-grassland habitat, they turned the transect 90° in a randomly chosen direction to avoid the obstacle.

Grassland habitat characterization

We sampled vegetation structure along bird transects to characterize bird habitat requirements from 2009 to 2011. We sampled ground and shrub cover parameters using ocular estimates in 2009 and 2010. In order to minimize potential bias and calibrate observers' estimation skills, we trained observers in estimating vegetation cover on plots

where all parameters had been either measured directly or estimated through quantitative sampling. An analysis of grass cover estimates from 2011 obtained through point-grid sampling of ground cover photos vs. ocular estimates on the same plots showed a strong correlation between the two approaches (r=0.92)). Another comparison of ocular *vs.* quantitative sampling methods for the same ground and shrub cover parameters in shortgrass prairie in Colorado found that ocular sampling provides similar results (i.e., within 2%) as quantitative sampling for grass and shrub cover, whereas ocular estimates of bare ground were 2-5% higher than quantitative estimates and ocular estimates of 'other' cover were 6-7% lower than quantitatively sampled estimates (Panjabi in prep.). These results suggest that ocular sampling of vegetation cover parameters provide a reasonably accurate assessment of grassland vegetation conditions.

We estimated vegetation parameters at 10 sub-sampling stations at 100 m intervals along each 1-km bird transect. These surveys were conducted immediately following each bird survey. At each sub-sampling station we made ocular estimates of ground cover within 5-m radius circular plots. To estimate ground cover, technicians looked directly down to the ground out to 2 meters in 4 cardinal directions, estimated the percent cover in each direction, averaged these, and then extrapolated the estimate out to 5 m, adjusting it for obvious variances. Ground cover estimates were broken down into 5 categories: woody shrubs/trees, bare ground, grass, herbaceous, and 'other' cover types (combined). Up to 3 'other' ground cover types were identified and listed in rank-order of dominance. 'Other' cover categories were: loose vegetation, cactus, woody vegetation, rock, yucca, animal excrement, and cryptobiotic crust. Average height was recorded for grass and herbaceous cover, with assistance of 30 cm rulers. Shrub cover was also estimated within 50 m of each sampling station using a similar approach. The habitat assessment also included characterizations of landscape-level site attributes including general topography (flatland, rolling hills, foothills, montane valleys, desert valleys, steep slopes and mesa top), adjacent habitats, landownership, and dominant grassland type. Grassland types followed the classification by the Instituto Nacional de Estadistica Geografia e Informatica (2005) which includes 'natural', halophytic, gypsophytic, induced or exotic grasslands. Gypsophytic and halophytic grasslands are defined by soil characteristics, whereas 'natural' grasslands include all other native grasslands apart from halophytic and gypsophytic grasslands.

Statistical analysis

We used hierarchical modeling approach (Royle and Dorazio 2008) to distance sampling (Buckland et al. 2001) to estimate parameters for bird density models for 29 grassland species (Appendix B) that account for both imperfect detection and random spatial and annual variation within and between GPCAs. We used the Bayesian estimation paradigm to compute model parameters. In this regard, density (D, number of individuals per unit of area) for line transects may be estimated from the equation (Buckland et al. 2001):

$$D = \frac{E(n) \cdot f(0) \cdot E(s)}{2L}$$

where $E(n)$ is the mean number of groups detected, $E(s)$ is the mean number of individuals per detection (cluster size), L is the total transect length and $f(0)$ is the probability density function of perpendicular distances evaluated at zero distance. This equation links the state

process (factors driving density) to the observation process (detections at transects) and explicitly provides their components that can be modeled as a function of covariates of interest. Our sampling units for this study were transects and therefore the random variables $E(n)$ and L in Eq(1) are indexed over all transects surveyed ($i = 1, 2, \ldots, n$). We used a half-normal detection function to model the distribution of perpendicular detection distances, whose probability density function $f(y)$ is given by

$$f(y) = \frac{1}{\sigma}\left(\frac{2}{\pi}\right)^{\frac{1}{2}} e^{-y^2/2\sigma^2}$$

where y is the perpendicular distance of detection and σ is a model parameter. To improve our estimation of parameter σ, we used right-truncated distance data (Buckland et al. 2001), with truncation determined for optimum maximum likelihood estimates using program Distance 6.0, as described in Panjabi et al (2010).

We assumed that the random variable number of detections for the i-th transect (n_i) followed a Poisson distribution with parameter $E(n_i)$. Therefore, the Poisson parameter $E(n_i)$ relates to density, our unobserved variable of interest, by

$$E(n_i) = \frac{2 \cdot L_i \cdot D_i}{E(s) \cdot \hat{f}(0)}$$

where L_i and D_i are the length of and the density at the i-transect. We modeled density as a function of random GPCA-by-year effects nested within the levels of random GPCA effects. Then, bird density at the i-th transect in the j-th GPCA and the k-th year ($D_{j(ik)}$) becomes:

$$D_{j(ik)} = e^{\beta_j GPCA + \beta_{k_j} GPCA \times YEAR}$$
$$\beta_j \sim N(\mu, \zeta)$$
$$\beta_{k_j} \sim N(\eta, \xi)$$

where each β is a regression parameter, and μ, ζ, η, and ξ are hyperparameters for *GPCA* and *GPCA*×*YEAR* random effects. We set prior distributions for all $\beta \sim N(0,1)$.

We used BUGS language (Spiegelhalter et al. 1996) to construct the likelihood function for each of study species and to specify a prior distribution for each parameter in the model. We implemented the BUGS language using WinBUGS 1.4 (Lunn et al. 2000) through program R (R Development Core Team 2009) with package R2WinBUGS (Sturtz et al. 2005). Markov Chain Monte Carlo runs consisted of 3 chains with a burn-in of 50, 000 samples, and a posterior distribution based on 50,000 samples for each chain. It is important to note that this report represents a major shift in the statistical paradigm used to analyze our datasets. Therefore, some discrepancies are expected in densities reported in other reports on the same dataset (Levandoski et al. 2009, Panjabi et al. 2010a, Panjabi et al. 2010b). In general, density estimates from our current Bayesian approach tend to be higher than estimates from maximum likelihood estimates presented in previous reports.

In addition, we conducted a hierarchical cluster analysis (Everitt et al. 2011) to investigate the geographic patterns in species composition throughout Chihuahuan Desert

grasslands at GPCAs and as well as associations among species. We used Euclidean distances on species' standardized log-transformed density data (average 2007-2011) as measure of dissimilarity and implemented the complete linkage clustering method through program *R* (R Development Core Team 2009). We thereby performed both *R*-type classification of GPCAs and *Q*-type classification of bird species. Finally, we calculated the total number of bird species detected on transects and the Shannon-Weaver index (Shannon and Weaver 1949) on counts to assess bird biodiversity at each GPCA and evaluate their relative importance in the conservation of grassland birds. Shannon's diversity index measures both species numbers and the equitability or evenness of allotment of individuals among species (Krebs 2009) and provides a convenient standard of comparisons among GPCAs.

Results and discussion

Survey effort

We have steadily increased our area of coverage since the onset of this study, from 211 transects in 75 blocks in 7 GPCAs in 2007 to 1,159 transects in 193 blocks in 15 GPCAs in 2011 (Table 1). We increased our coverage considerably in 2011 when we added 5 new GPCAs to our monitoring effort: Armendaris, Sonoita (U.S. side), New Mexico Bootheel, Otero Mesa, and Sulphur Springs. We also expanded our sampling efforts in the Janos, Valles Centrales and El Tokio GPCAs in 2011, due to boundary expansions for these GPCAs as described by Pool and Panjabi (2011). We stopped sampling in Cuatro Ciénegas in 2011 due to low bird numbers. In 2011, we also split the Llano Las Amapolas GPCA from the Lagunas del Este GPCA, with which it was previously lumped; both were sampled.

Biogeographic regions

Cluster analysis of GPCAs (*R*-type classification) based on bird species composition shows geographically consistent groups suggesting a regionalization or the existence geographic units of grassland bird species' occurrence within the Chihuahuan Desert (Fig. 2). Six regions can be recognized: 1) *Southern Sierra Madre Occidental Foothills*, with Cuchillas de la Zarca and Malpaís; 2) *Eastern*, with Cuatro Ciénegas and El Tokio; 3) *Central*, with Lagunas del Este, Mapimí and Janos; 4) *Northern*, with Armendaris, Otero Mesa and Llano Las Amapolas; 5) *Sky Island Borderlands*, with Sonoita, Sulphur Springs, New Mexico Bootheel, and Valles Centrales; and 6) *Trans-Rio Grande*, with Marfa and Valle Colombia. The affinity of Janos to the *Central* region and the affinity of Valles Centrales to the *Sky Island Borderlands* region, is intriguing. Given that most bird abundance in winter grassland bird communities is distributed among a few species (Manzano-Fischer et al. 1999, Macias-Duarte et al. 2009, Panjabi et al. 2010b), the grouping of GPCAs in this analysis is mainly driven by similarities in these few species.

Biogeographic guilds

Cluster analysis of species (*Q*-type classification) based on their relative abundances on GPCAs suggests 4 ecological guilds within grassland bird guild that show similar preferential use of GPCAs (Fig. 3). The most obvious guild comprises large-bodied birds

(most of them raptors) including Ferruginous Hawk, Burrowing Owl, Northern Harrier, and Long-billed Curlew. Another apparent guild group comprises strict grassland sparrows, such as Lark Bunting, Grasshopper Sparrow, and Horned Lark, except for the Chipping Sparrow. Two other groups show no evidence of common traits, such as the group formed by Baird's Sparrow, Clay-colored Sparrow, Mourning Dove, and Eastern Meadowlark.

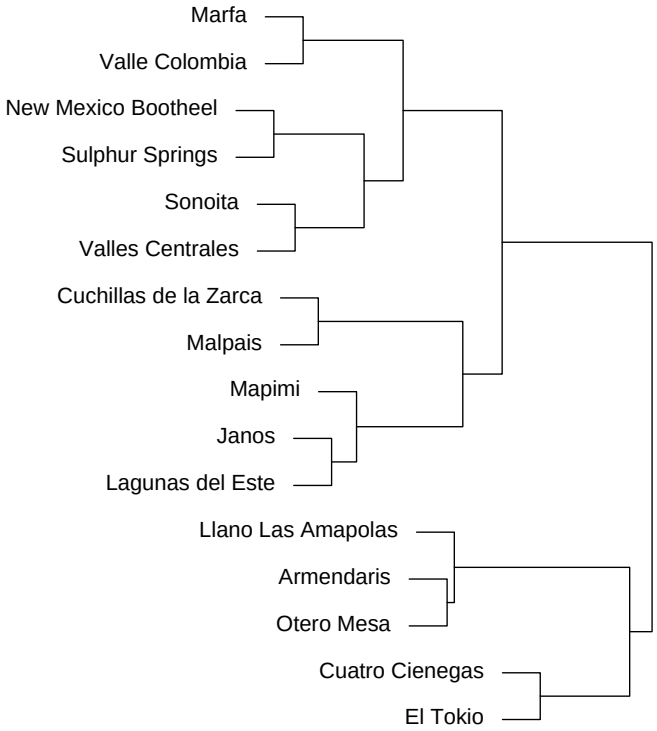


Fig. 2. Hierarchical cluster analysis that groups Grassland Priority Conservation areas based on average species density from 2007-2011.

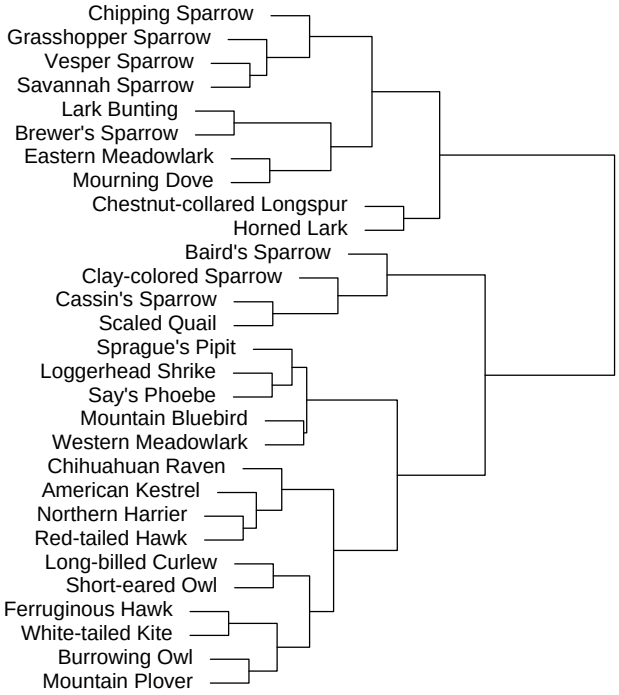


Fig. 3. Hierarchical cluster analysis that groups wintering grassland species based on average species density at Grassland Priority Conservation Areas from 2007-2011.

Overall bird density and distribution

We recorded 69,657 birds of 178 species in 2011, including 50 grassland associated species, and 31 priority species. Average number of species per GPCA is 63.4 ± 7.8 and average Shannon-Weaver index per GPCA is 4.01 ± 0.17. We provide total species counts per GPCA and year in Appendix A. The number of birds detected per transect decreased 10.4% in 2011 (60.1 birds per transect) compared to that of 2010 (67.1 birds per transect) but this annual decrease may be masked by an increase in precision as the number of transects increased by 57%. As in previous years, the most abundant species observed was Chestnut-collared Longspur (*n* = 19,042), with 27.3% of the total bird counts, followed by Brewer's Sparrow (11.8%), Lark Bunting (9.4%), Vesper Sparrow (7.8%), and Horned Lark (7.1%). These 5 species alone constitute >60% of the total counts during 2011. We estimated annual densities from 2007 to 2011 for 29 grassland bird species (including 18 priority species) and 4 species groups (*Ammodramus* spp., *Ammodramus-Passerculus*, *Corvus* spp., and *Sturnella* spp.) in all 16 GPCAs (Appendix B). In this section, we present and discuss average annual species' densities in each GPCA during this 5-year period to provide a long-term view of the relative importance of each GPCA for the conservation of various grassland bird species in winter. We also examine gross changes in grassland bird densities and community structure in each GPCA across years.

Table 1. Annual survey effort in each Chihuahuan Grassland Priority Conservation Area.

Grassland Priority	2007		2008		2009		2010		2011	
Conservation Area	Blocks	Transects	Blocks	Transects	Blocks	Transects	Blocks	Transects	Blocks	Transects
Armendaris									6	36
Cuatro Ciénegas	3	18	3	18	3	18	3	18		
Cuchillas de la Zarca	16	24	16	96	16	96	17	102	17	102
Janos	13	73	13	78	13	78	14	84	22	132
Lagunas del Este					13	76	13	76	12	72
Llano Las Amapolas									1	6
Malpaís							6	36	6	36
Mapimí	12	23	12	71	13	76	14	78	13	75
Marfa					14	78	13	77	13	78
New Mexico Bootheel									25	146
Otero Mesa									6	36
Sonoita			2	12	5	36	5	36	13	78
Sulphur Springs									11	78
El Tokio	9	9	7	60	8	62	8	60	11	62
Valles Centrales	21	58	21	126	21	126	22	132	31	186
Valle Colombia	1	6	6	36	6	36	6	36	6	36
All GPCAs	75	211	80	497	112	682	121	735	193	1159

Total grassland bird density (all 29 species analyzed combined) was similar across years, except with substantially higher densities in 2009 across the Chihuahuan Desert GPCAs (Fig. 4). This temporal pattern is present in Mapimí, Valle Colombia, Valles Centrales, Lagunas del Este, Llano Las Amapolas, and Marfa, although the latter 3 GPCAs have only been surveyed since 2009. The rest of the GPCAs show either different trends or lack of sufficient years to visualize any trend. Densities at Cuchillas de la Zarca have steadily increased since 2007 (except for 2011), and there appear to be decreasing trends in Janos and Sonoita (see GPCA accounts below). Given that summer precipitation has been shown to be strongly correlated with grassland bird densities in the Chihuahuan Desert (Dunning and Brown 1982, Macias-Duarte et al. 2009), changes in grassland bird densities throughout the Chihuahuan Desert may correspond to changes in the distribution of precipitation and therefore, changes in the distribution of food resources. This hypothesis will be further evaluated in future reports and publications.

Average total wintering grassland bird density in the region was roughly 700 birds km^{-2} across all GPCAs and years (Fig. 4). However, the 5-year average wintering grassland bird density in each GPCA differed among GPCAs (Fig. 5). In decreasing order, Cuchillas de la Zarca, Otero Mesa, Lagunas del Este, Malpaís, Mapimí, New Mexico Bootheel and Janos had the highest average grassland bird densities. Combined grassland bird density was significantly lower in Cuatro Ciénegas than in other GPCAs. In most GPCAs, the combined grassland bird density was mostly driven by variation in a few dominant species (see GPCA accounts).

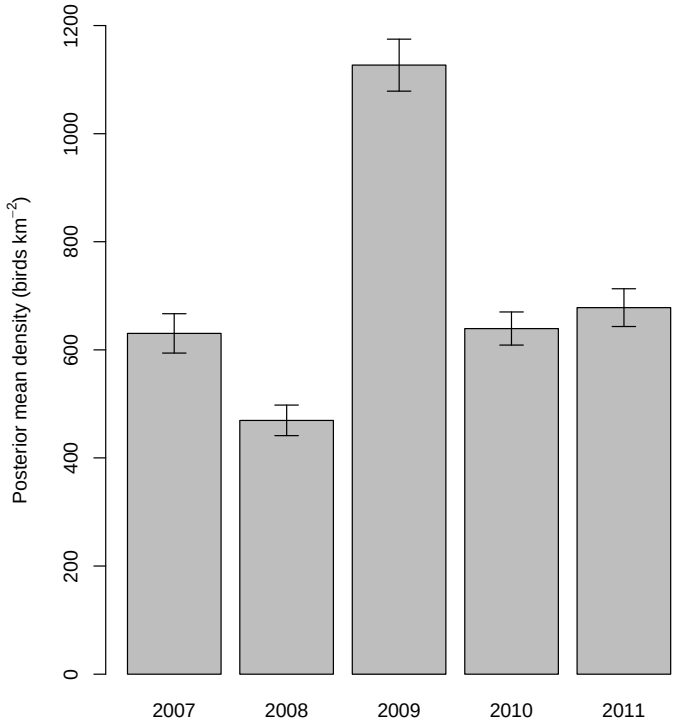


Fig. 4. Mean density of wintering grassland birds (29 species combined) across all Grassland Priority Conservation Areas from 2007-2011.

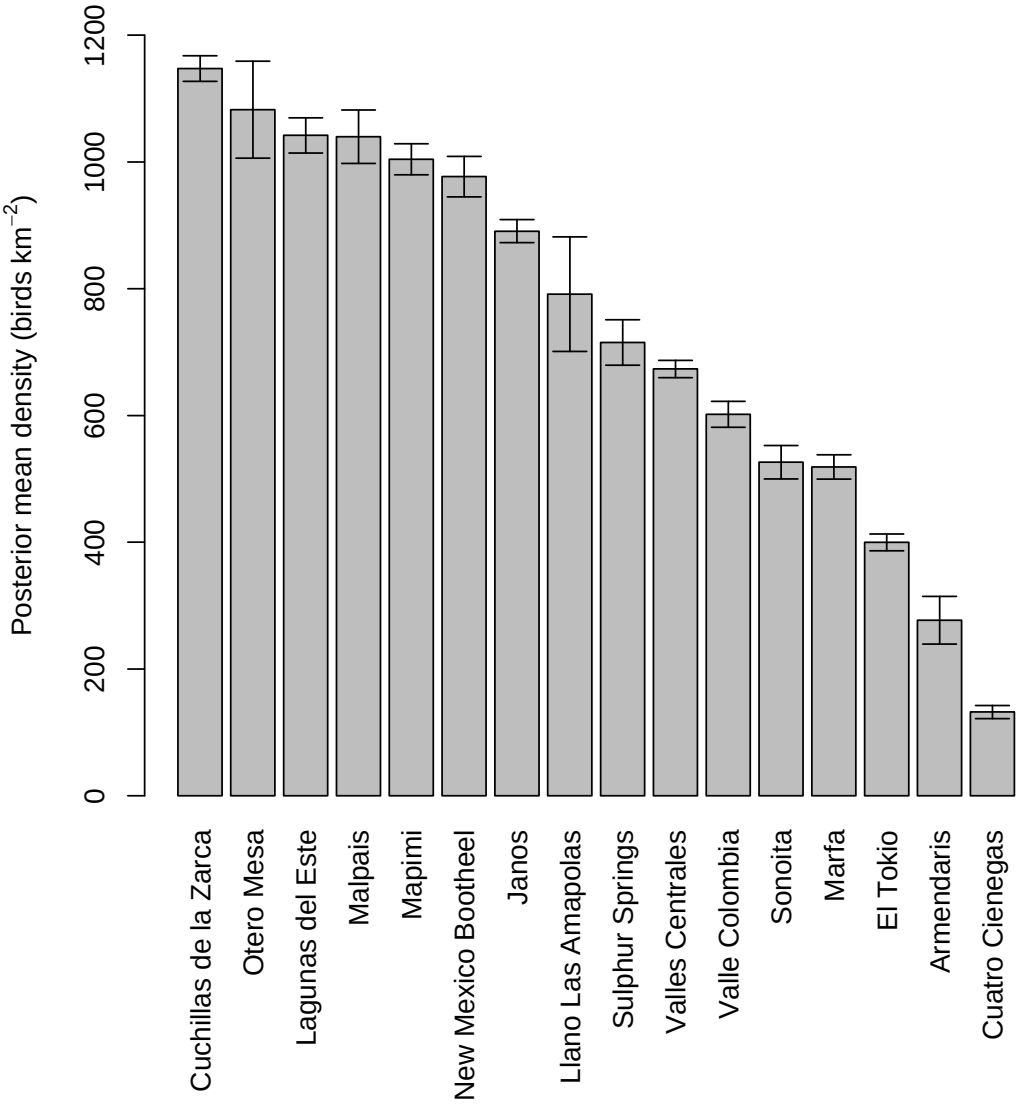


Fig. 5. Five-year average (2007-2011) wintering grassland bird density (29 spp. combined) in each Grassland Priority Conservation Area.

Abundance and species diversity at Grassland Priority Conservation Areas

In this section, we describe total annual grassland bird abundance and composition at each GPCA. These GPCA accounts allow a quick assessment the relative importance of each GPCA in the conservation of each grassland bird species. Total annual densities are calculated as the sum of species' mean posterior density and annual mean densities per species is computed as the average of mean annual posterior density (see Appendix B). Detailed descriptions for habitat characteristics and land ownership for each GPCA are provided in Panjabi et al. (2010a), and Pool and Panjabi (2011). Note that species lacking data in bar graphs indicates no detections.

Armendaris

We surveyed Armendaris only in 2011 and therefore caution should be taken when making comparisons to average statistics with other GPCAs. Average bird density is one of the lowest (276.9 birds km^{-2}) among all GPCA. Species richness (21 species) and species diversity ($H = 3.36$) in Armendaris is low and ranking in the 14th and 13th place among GPCAs, respectively. Chestnut-collared Longspur is the most abundant species with 43.1% of the total average abundance. Together with Lark Bunting, Horned Lark, Brewer's Sparrow, and Clay-colored Sparrow, these 5 species account for 97.7% of the total average density in this GPCA. No grassland species reaches its maximum density in Armendaris. A large portion of wintering grassland species (62%) are absent in this GPCA, including Savannah Sparrow, Vesper Sparrow, and Western Meadowlark among others.

Bird species composition in Armendaris shows affinity with its neighboring GPCA Otero Mesa, and more surprisingly with GPCA Llano Las Amapolas in eastern Chihuahua.

Cuatro Ciénegas

Cuatro Ciénegas has the lowest density of grassland birds among all GPCAs (Fig. 5) with 132.2 birds km^{-2}. Average annual density increased dramatically from 2007 to 2009 followed by a decrease in 2010 (Fig. 8). Low grassland bird abundance and variability in grassland bird presence and abundance over time underscores the need for long-term studies to fully assess grassland bird community structure this GPCA.

Species richness (41 species) and species diversity ($H = 3.84$) in Cuatro Ciénegas are relatively low and ranking in 13th and 10th place among GPCAs, respectively. The most abundant species is Horned Lark, which outnumbers all other bird species, and comprises 76.5% of the total average density, followed by Lark Bunting, Eastern Meadowlark, and Brewer's Sparrow (Fig. 9). Chihuahuan Raven attains its highest density in Cuatro Ciénegas. Sandhill Crane, Long-billed Curlew, Loggerhead Shrike, Mountain Bluebird and Sprague's Pipit can also be found regularly in Cuatro Ciénegas.

Cuatro Ciénegas shows a closer affinity in species composition to its neighboring GPCA El Tokio, mainly driven by the high representation of Horned Larks in both GPCAs. This affinity may be related to proximity and not in similarities in grassland habitat because all bird transects in Cuatro Ciénegas were located in natural grasslands whereas most bird transects in El Tokio were located in gypsophylic grasslands (Panjabi et al. 2010b). This affinity may therefore be driven by regional dispersal of Horned Larks, an abundant species throughout the eastern Chihuahuan Desert grasslands.

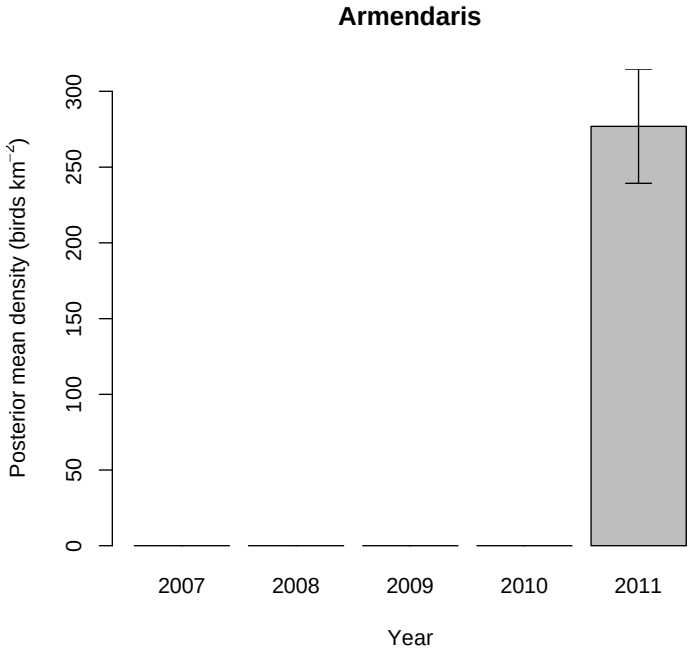


Fig. 6. Annual posterior mean bird density and standard deviation in Armendaris Grassland Priority Conservation Area.

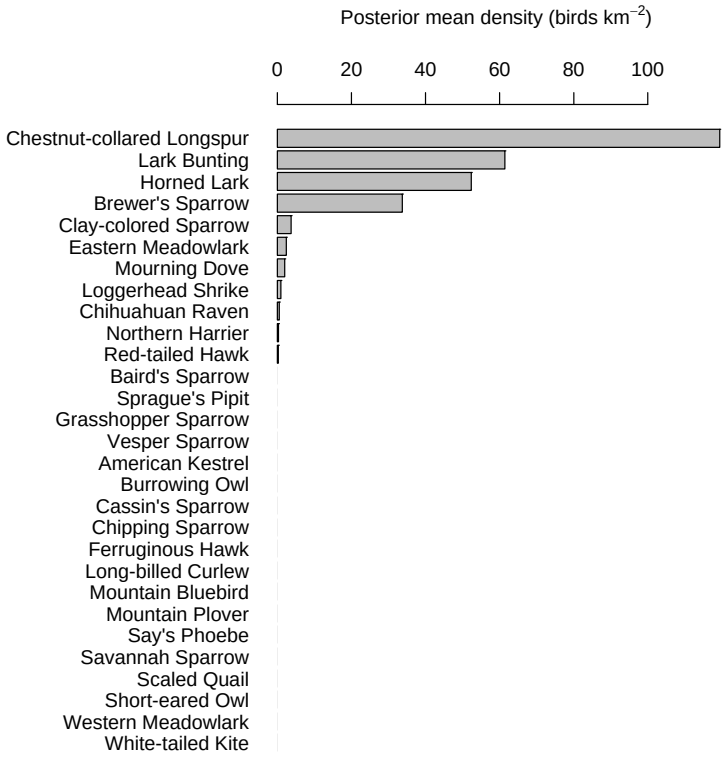


Fig. 7. Average density of wintering grassland bird species in Armendaris GPCA (2011)

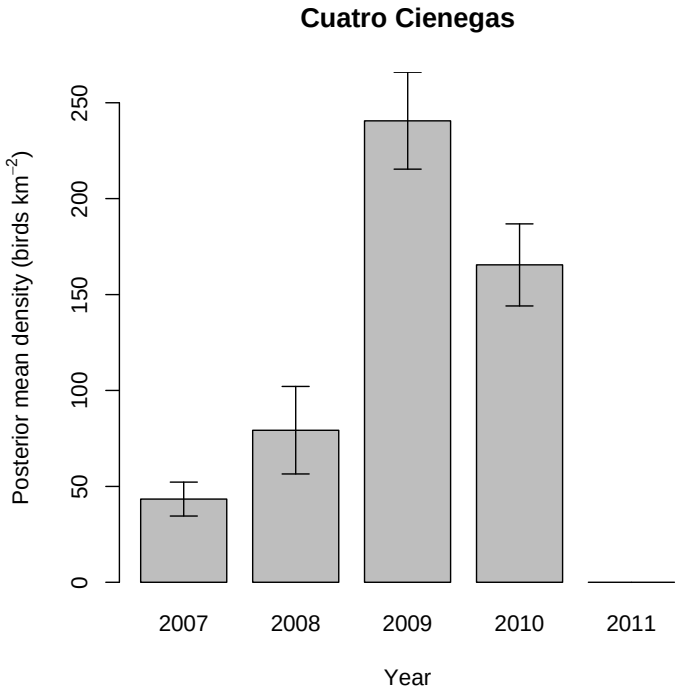


Fig. 8. Annual posterior mean bird density and standard deviation in Cuatro Ciénegas Grassland Priority Conservation Area.

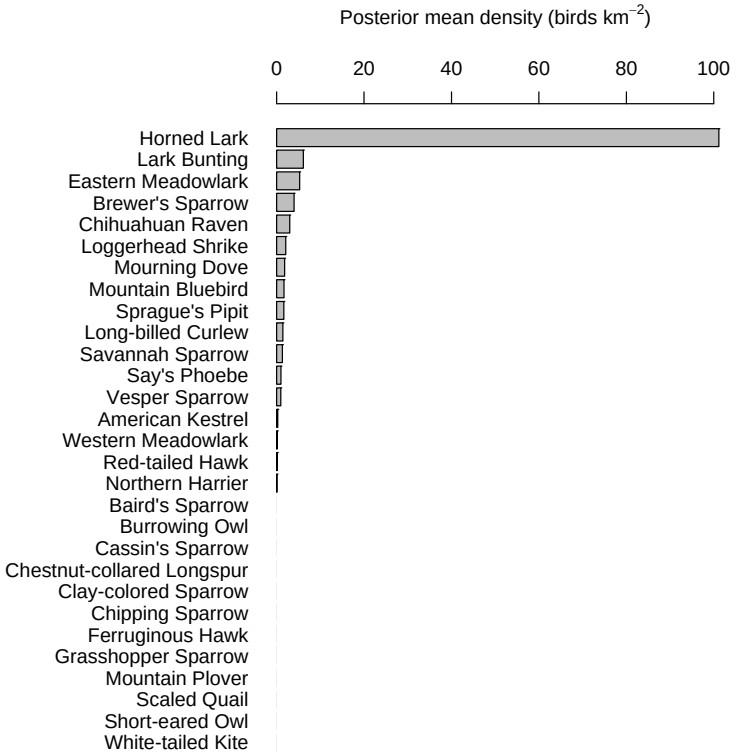


Fig. 9. Four-year average density of wintering grassland bird species in Cuatro Ciénegas GPCA (2007-2010)

Cuchillas de la Zarca

Cuchillas de la Zarca support the highest density of grassland birds among all GPCAs, with an average of 1147.3 birds km^{-2} (Fig. 5). In 2010, the grasslands in Cuchillas de la Zarca supported nearly 1291 birds km^{-2} (Figure 10), more than any other GPCA in Mexico. Grassland bird density increased steadily from 2007 to 2010, but decreased in 2011.

Cuchillas de la Zarca has the most diverse avifauna among GPCAs. Cuchillas de la Zarca harbors 123 bird species, ranking first in species richness, and has a diversity of H = 4.85, ranking third. Chipping Sparrow is the most abundant species with 28.7% of the total density (Fig. 11), followed by Vesper Sparrow, Brewer's Sparrow, Grasshopper Sparrow, and Savannah Sparrow. These species comprise 74.9% percent of the total abundance. Baird's Sparrow, Chipping Sparrow, and Mourning Dove are more abundant in Cuchillas de la Zarca than in any other GPCA, thus making this the most important GPCA for the conservation of these species in winter. Burrowing Owl, Mountain Plover, and Short-eared Owl were absent on our transects in Cuchillas de la Zarca.

Cuchillas de la Zarca shows similar composition to its southern GPCA neighbor Malpaís. Both GPCAs have the same ranking in relative density down to the 4th species (Fig. 11 and Fig. 19). This result suggest that ecological conditions may remain similar throughout the Sierra Madre Occidental foothills in Durango.

Janos

Janos supports the only known population of black-tailed prairie dogs in Mexico, which was once recognized as the largest in the world (55,000 ha) and has been reduced by 73% since 1988 (Ceballos et al. 2010) by conversion of grassland to cropland, shrub encroachment and excessive grazing pressure. Average annual density in Janos ranks 7th (Fig. 5) with 890.69 birds km^{-2}. Total grassland bird density was highest in 2007 and 2009 and lowest in 2010 (Figure 12); the data suggest a decreasing overall trend.

Janos supports one of the highest diversity of birds in the Chihuahuan Desert (H = 4.86). Species richness (102 species) ranks second among GPCAs only after Cuchillas de la Zarca. Chestnut-collared Longspur is the most abundant species in the area (Figure 13) with 29.9% of the total density. Other common grassland bird species in the area include, in decreasing order, Vesper Sparrow, Lark Bunting , Savannah Sparrow, and Brewer's Sparrow. These 5 sparrow species comprise 72% of the total bird abundance in Janos. In addition, Janos supports large winter populations of Eastern Meadowlarks, Long-billed Curlews and Mourning Doves relative to the rest of the GPCAs (Appendix B). Golden and Bald Eagles both occur in Janos in winter, with Golden Eagles also nesting locally. In early 2010, Aplomado Falcons, likely birds dispersed from reintroduction sites in New Mexico, were also present in the area.

The presence of prairie dogs in Janos creates a suite of ecological conditions that promote the abundance of threatened grassland birds. Janos is one of only 2 GPCAs that currently support Mountain Plover populations. The prairie dog complex in Janos also supports significant numbers of Ferruginous Hawk, Long-billed Curlew, Burrowing Owl and McCown's Longspur, among other species.

Janos show affinities in bird species composition to Mapimí and Lagunas del Este. These 3 GPCAs have a large proportion of natural grasslands and are important representations of halophytic grasslands. However, it would be expected that the presence of prairie dogs in both Janos and El Tokio GPCAs would generate similar bird species

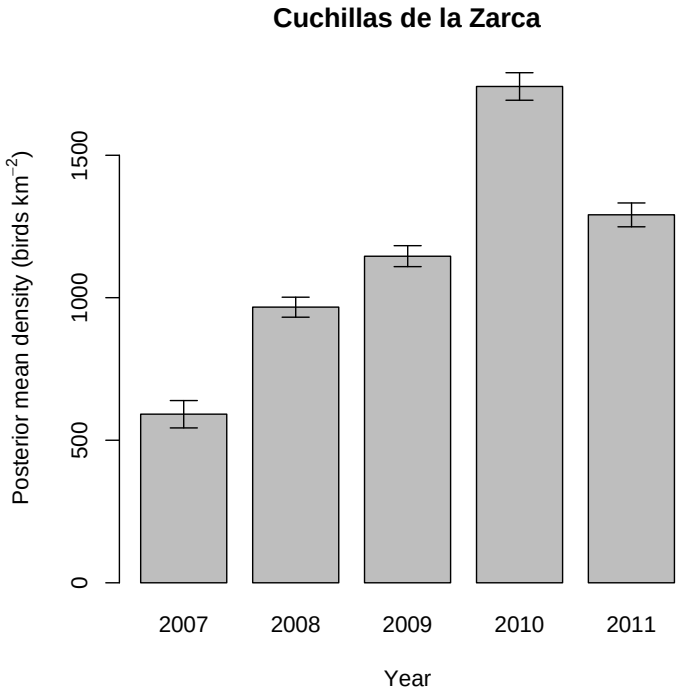


Fig. 10. Annual posterior mean bird density and standard deviation in Cuchillas de la Zarca Grassland Priority Conservation Area.

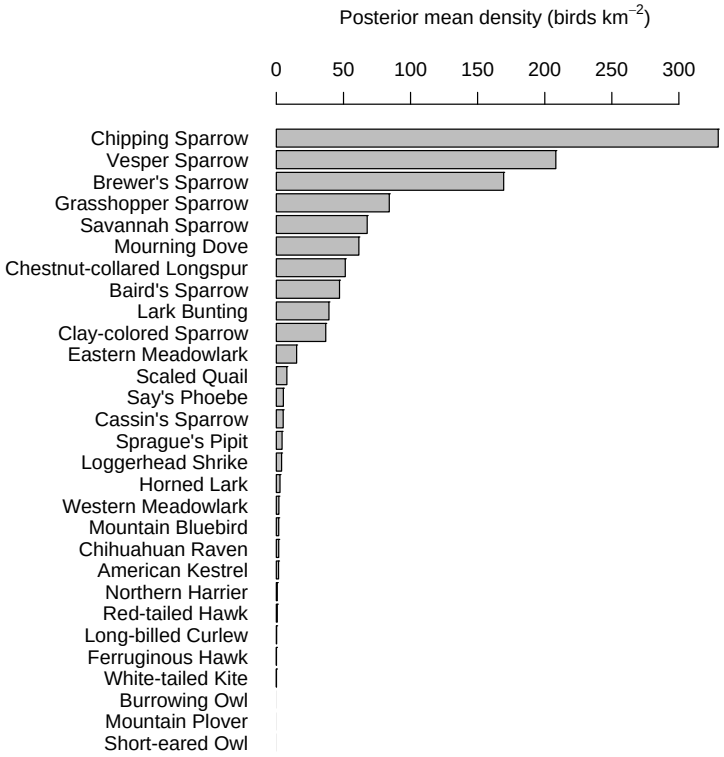


Fig. 11. Five-year average density of wintering grassland bird species in Cuchillas de la Zarca (2007-2011)

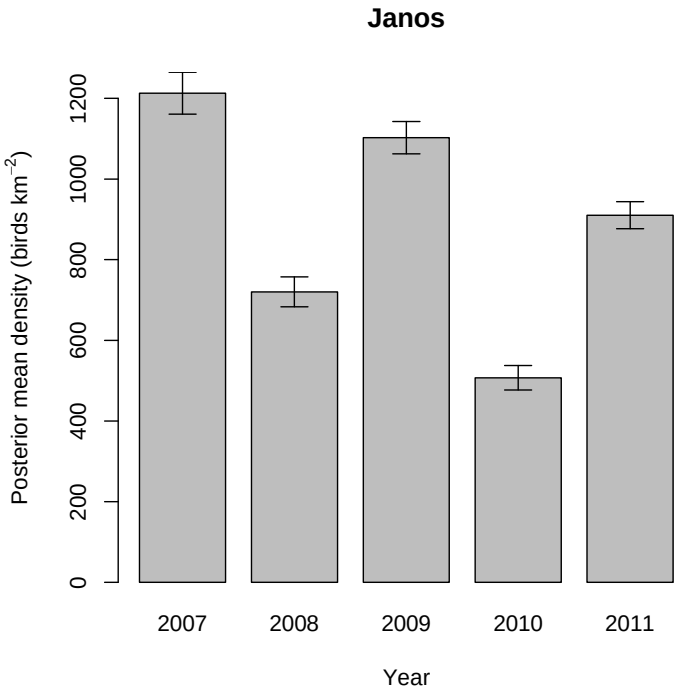


Fig. 12. Annual posterior mean bird density and standard deviation in Janos Grassland Priority Conservation Area.

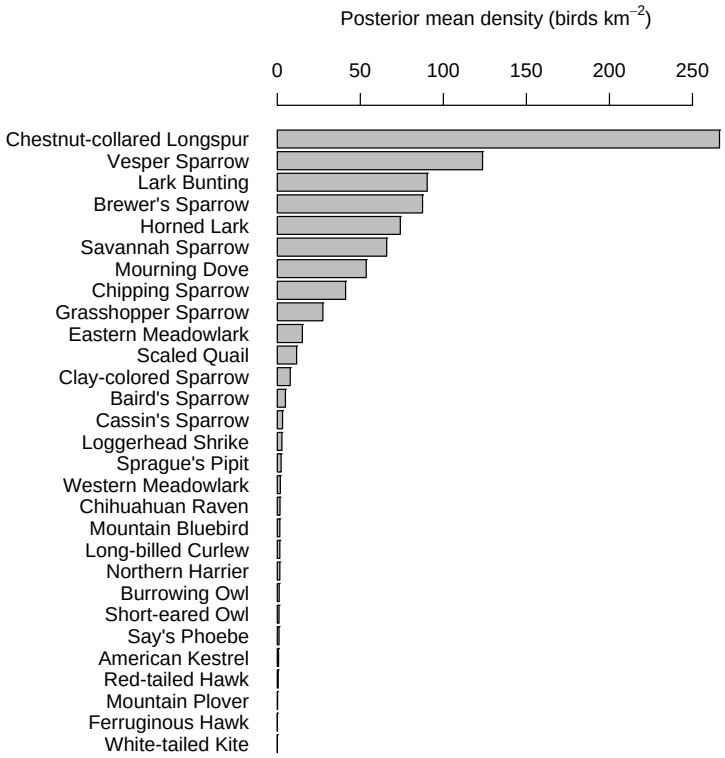


Fig. 13. Five-year average density of wintering grassland bird species in Janos GPCA (2001-2011)

composition in these 2 GPCAs and our cluster analysis would group them together. However, prairie dog habitat is highly localized in Janos GPCA and relative few randomly-set transects fell in this habitat type. In addition, most grasslands in Janos are natural whereas most grasslands in El Tokio are gypsophylic.

Lagunas del Este

Lagunas del Este holds one of the highest densities of wintering grassland birds, with an annual average of 1,041 birds km^{-2}, ranking third after Cuchillas de la Zarca and Otero Mesa (Fig. 5). However, bird density has varied significantly from year to year (Fig. 14). Bird density reached its maximum in 2009 (1910 birds km^{-2}).

Lagunas del Este has intermediate levels of wintering bird diversity relative to other GPCAs. Species richness (63 species) and species diversity (H = 4.28) rank in 7th and 8th place among all GPCAs. Chestnut-collared Longspur is the most abundant grassland bird (average annual density = 306 birds km^{-2}) comprising 29.4% of the total bird abundance, followed by Vesper Sparrow, Clay-colored Sparrow, Lark Bunting, and Grasshopper Sparrow (Fig. 15). These 5 species comprise 75.4% of the total bird abundance. Lagunas del Este is an area of importance for the conservation of Cassin's Sparrow, Clay-colored Sparrow, Vesper Sparrow, and Mourning Dove, which apparently find suitable conditions for winter survival and reach their maximum density in this GPCA (Appendix B). Sprague's Pipit also occurs in moderate relative abundance. Other birds of interest found in Lagunas del Este in low to moderate numbers include Ferruginous Hawk, Long-billed Curlew, Short-eared Owl, Burrowing Owl, Loggerhead Shrike and Mountain Bluebird. Mountain Plover is the only priority species absent from this GPCA.

Lagunas del Este show its closest affinity in species composition to Janos, although no prairie dogs exists in Lagunas del Este. This group identified by our hierarchical clustering analysis is largely the result of sharing the most abundant species: Chestnut-collared Longspur, Vesper Sparrow and Lark Bunting.

Llano Las Amapolas

We only surveyed 6 transects in a single sampling block in Llano Las Amapolas from 2009 and 2011, due to its relatively small size compared to other GPCAs (Fig 1). Therefore, our bird density estimates tend to be less precise (show wider 95% credible intervals, Appendix B) than estimates from other GPCAs with larger sample sizes. Llano Las Amapolas shows an annual mean density of wintering grassland birds (791.3 birds km^{-2}) similar to the annual average across GPCAs (Fig. 5). Like other GPCAs, Llano Las Amapolas shows a maximum annual bird density during 2009 followed by a significant decrease in 2010 (Fig. 16).

Species richness (18 species) and species diversity (H = 3.03) in Llano Las Amapolas is one of the lowest and ranks 15th for both parameters among GPCAs, respectively. However, this relative density may be an artifact of low sample size. Chestnut-collared Longspur is the dominant species accounting for 75.2% of the total bird density. The next 4 most abundant species are Horned Lark, Brewer's Sparrow, Lark Bunting, and Vesper Sparrows, accounting for another 18.5% of the total bird density (Fig. 17). Species that show their maximum annual or relatively high density in Llano Las Amapolas are Horned Lark, Baird's Sparrow and Chestnut-collared Longspur (reaching 1,290 birds km^{-2} in 2009). This GPCA shows affinity in species composition to Armendaris and Otero Mesa.

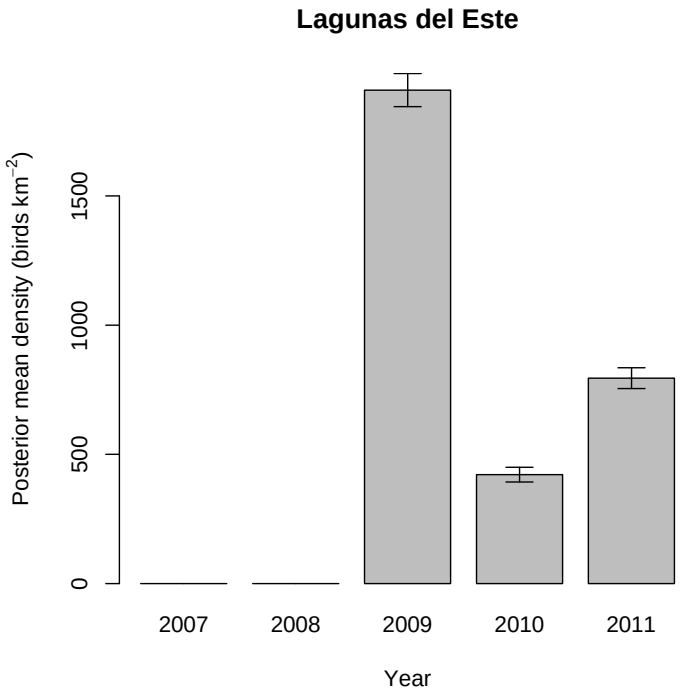


Fig. 14. Annual posterior mean bird density and standard deviation in Lagunas del Este Grassland Priority Conservation Area.

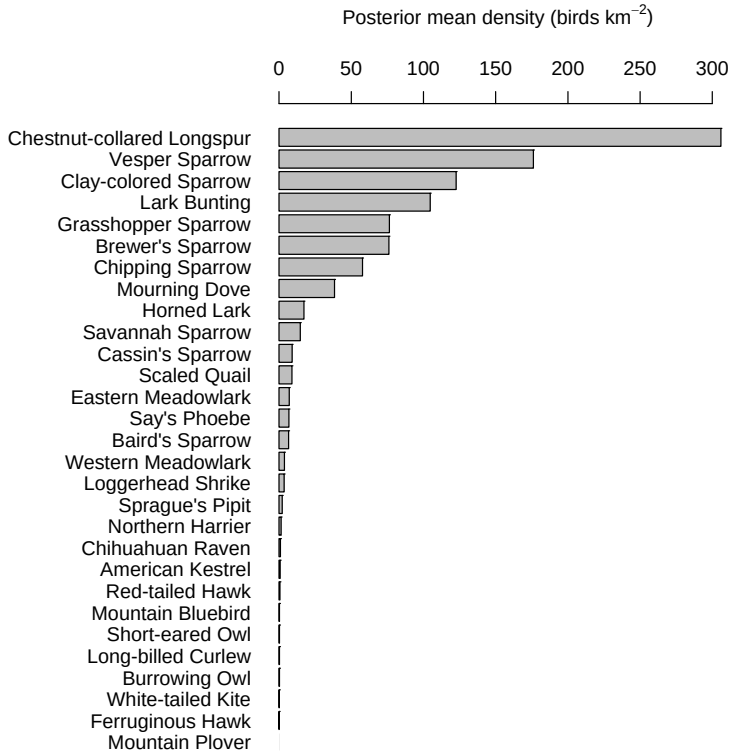


Fig. 15. Three-year average density of wintering grassland bird species in Lagunas del Este GPCA (2009-2011)

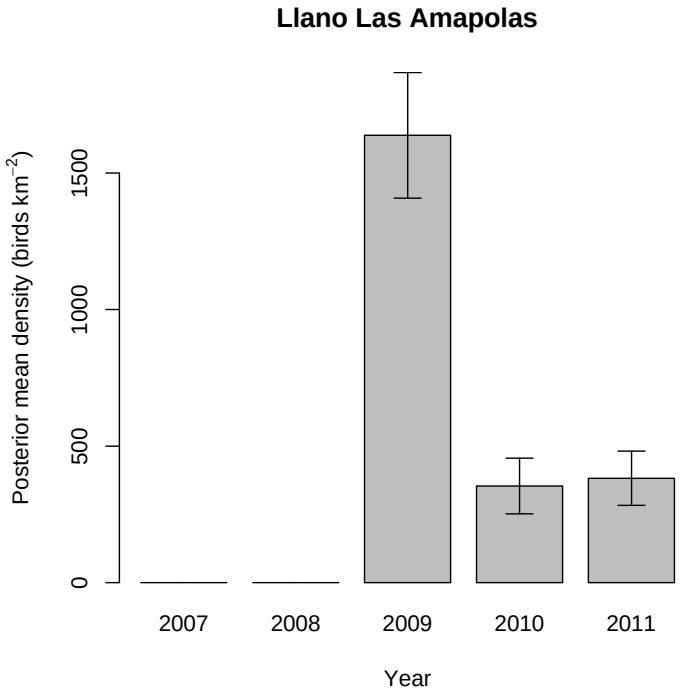


Fig. 16. Annual posterior mean bird density and standard deviation in Llano Las Amapolas Grassland Priority Conservation Area.

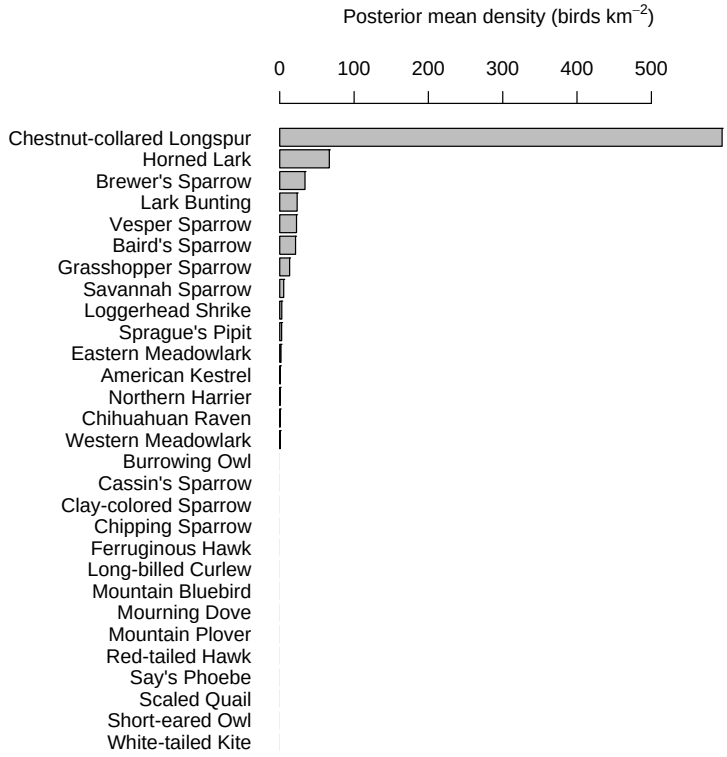


Fig. 17. Three-year average density of wintering grassland bird species in Llano Las Amapolas GPCA (2007-2011).

Malpaís

Malpaís has only been surveyed twice (2010 and 2011) and overall average estimates for this GPCA may not be representative of long-term conditions. Nevertheless, we have documented one of the largest densities of grassland birds in this GPCA, with an average winter density of 1,040 birds km^{-2}, ranking 4th for bird density (Fig 5). Bird density remained high in both years surveyed with 1152 and 927 birds km^{-2}, respectively (Fig. 18).

Malpaís attains a high biodiversity with 99 bird species (36 above the average across GPCAs) and a species diversity of H=5.01, ranking first among GPCAs in the latter. Chipping sparrow is the most abundant species in this GPCA, accounting for 28% of the relative density, followed by Vesper Sparrow, Brewer's Sparrow, Grasshopper Sparrow and Clay-colored Sparrow (Fig. 19). These 5 species account for 83.7% of the relative density. Malpaís harbors maximum or near maximum densities for Chipping Sparrow, Grasshopper Sparrow, Loggerhead Shrike and Red-tailed Hawk and should be considered an area of conservation importance for these species. Chestnut-collared Longspur, Burrowing Owl, Long-billed Curlew, Mountain Plover, and Short-eared Owl have not been recorded in Malpaís during 2 years of winter surveys.

Malpaís shows a close affinity in species composition to Cuchillas de la Zarca, constituting the *Southern Sierra Madre Occidental Foothills* cluster. Both GPCAs share the same species' abundance ranking in the first 4 species.

Mapimí

Grassland bird density at Mapimí in 2009 was the highest ever recorded among all GPCAs with 2,190 birds km^{-2}, 6.6 times higher than the lowest density recorded in 2011 (Fig. 20). Average annual density in Mapimí was 1,004 birds km^{-2}, ranking 5th among all GPCAs (Fig. 5).

Mapimí has an intermediate level of diversity in its wintering bird community among GPCAs. Species richness (75 species) and species diversity (H = 4.32) rank 6th and 7th among all GPCAs. Lark Bunting was the dominant species, accounting for 30.5% of the total relative density, followed by Brewer's Sparrow, Vesper Sparrow, and Grasshopper Sparrow (Fig. 21). These 5 species account for 81.6% of the total relative abundance.

Mapimí is an area of conservation importance for several species that occur at maximum or near maximum densities, such as Brewer's Sparrow, Grasshopper Sparrow, Vesper Sparrow, Lark Bunting, Mountain Bluebird, Scaled Quail, Long-billed Curlew, Short-eared Owl, Loggerhead Shrike and Say's Phoebe. Among the 29 grassland bird species analyzed in this report, Mountain Plover is the only species that has not been sighted on our transects in Mapimí.

Mapimí shows affinity with the avifauna of Janos and Valles Centrales. Grasslands in these 3 GPCAs are mainly natural and halophytic grasslands. After Cuatro Ciénegas, these 3 GPCAs have the largest proportion of halophytic grasslands among all GPCAs. These results suggest a close correspondence between habitat and species guilds and highlight the importance of preserving halophytic grasslands.

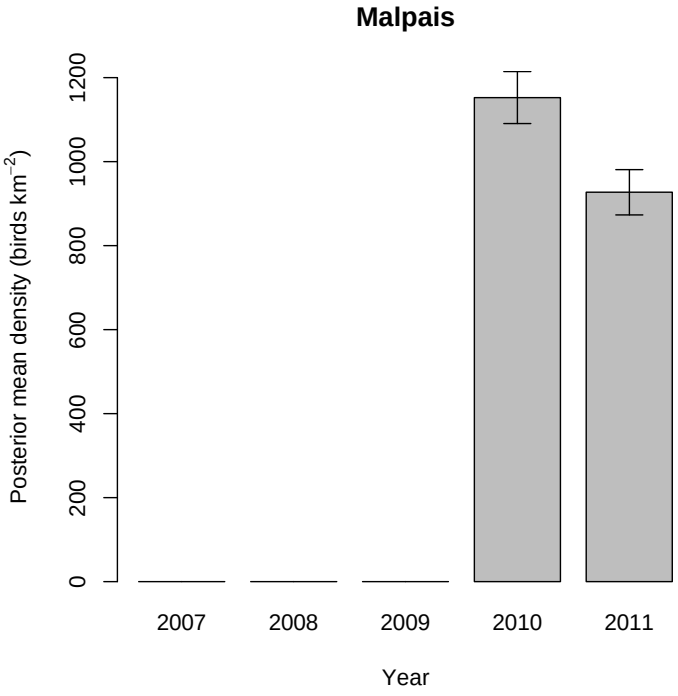


Fig. 18. Annual posterior mean bird density and standard deviation in Malpaís Grassland Priority Conservation Area.

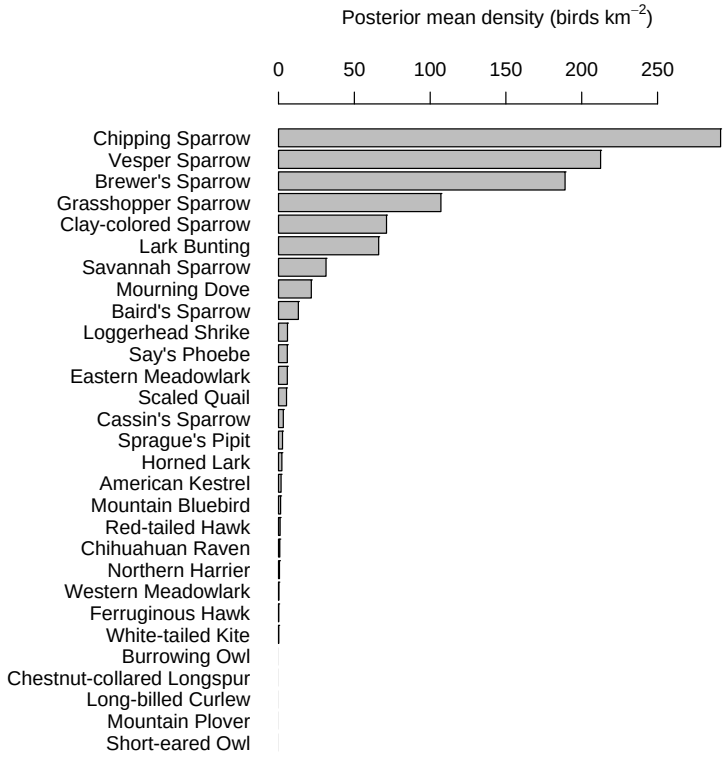


Fig. 19. Five-year average density of wintering grassland bird species in Malpaís GPCA (2007-2011).

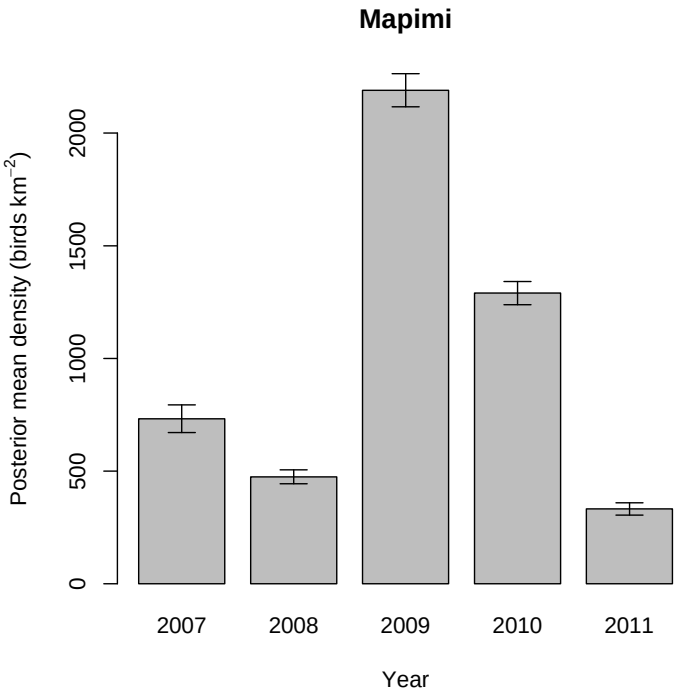


Fig. 20. Annual posterior mean bird density and standard deviation in Mapimí Grassland Priority Conservation Area.

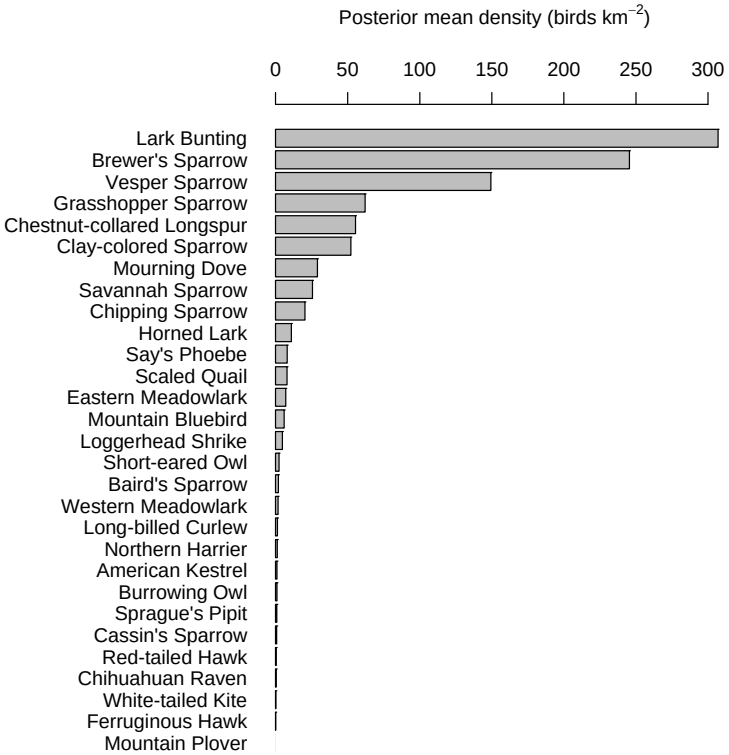


Fig. 21. Five-year average density of wintering grassland bird species in Mapimí GPCA (2007-2011)**.**

Marfa

Marfa showed a maximum bird density in 2009 similar to other GPCAs, with 978.2 birds km^{-2}, followed by a dramatic decrease in 2010 and 2011 (Fig. 22). However, this area shows a relatively low average annual density, with 518.8 birds km^{-2} (Fig. 5). Marfa has intermediate levels of diversity in its wintering bird community among GPCAs. Species richness (60 species) and species diversity (H = 4.49) rank 8th and 7th among all GPCAs. Chestnut-collared Longspur is the most abundant species, accounting for 46.4% of the annual bird abundance, followed by Vesper Sparrow, Horned Lark, Savannah Sparrow and Grasshopper Sparrow. Marfa is an area of conservation importance to Western Meadowlark, which attained its maximum recorded annual density in this GPCA (10.1 birds km^{-2}, Appendix B). Marfa, along with Valle Colombia and Lagunas del Este, is an area of conservation importance for Cassin's Sparrows, whose average annual density is 6.8 birds km^{-2}. Species that have not been observed in this GPCA are Mountain Plover, Short-eared Owl, and White-tailed Kite.

Marfa's avifauna show affinities to Valle Colombia's avifauna and form the *Trans-Rio Grande* region (Fig. 2). Interestingly, Marfa and Valle Colombia have the largest proportion of private ownership, with 95 and 100% of the GPCA's transects being located in private lands, respectively (Panjabi et al. 2010b).

New Mexico Bootheel

New Mexico Bootheel was incorporated in our study in 2011 and therefore we have data for only one year and no temporal trends can be identified for this GPCA. Mean annual density in the New Mexico Bootheel is 976.9 birds km^{-2}, ranking 6^{th} in bird density among GPCAs (Fig. 5).

New Mexico Bootheel attained a relatively low level of diversity in its wintering bird community among GPCAs, with a species richness of 45 species (18 species below the average) and species diversity rank (H = 3.63) of 12th and 11th place among all GPCAs. Again, this low diversity may be an artifact of low sample size from only a single year. Chestnut-collared Longspur is the most abundant grassland bird species, accounting for 35.4% of the relative density, followed by Brewer's Sparrow, Horned Lark, Lark Bunting and Vesper Sparrow (Fig. 25). These 5 species account for 89.8% of the total density. New Mexico Bootheel is an area of conservation importance for Horned Lark and Brewer's Sparrow that attained one of the largest densities among GPCAs. Grassland species that have not been recorded in our transects are Burrowing, Long-billed Curlew, Mountain Bluebird, Mountain Plover, Short-eared Owl and White-tailed Kite.

New Mexico Bootheel avifauna shows affinity with that of its neighboring GPCA Sulphur Springs in southeastern Arizona. This cluster suggest that New Mexico Bootheel and Sulphur Springs, by virtue of their proximity, share ecological conditions that lead to similar avifauna and could be managed as one GPCA.

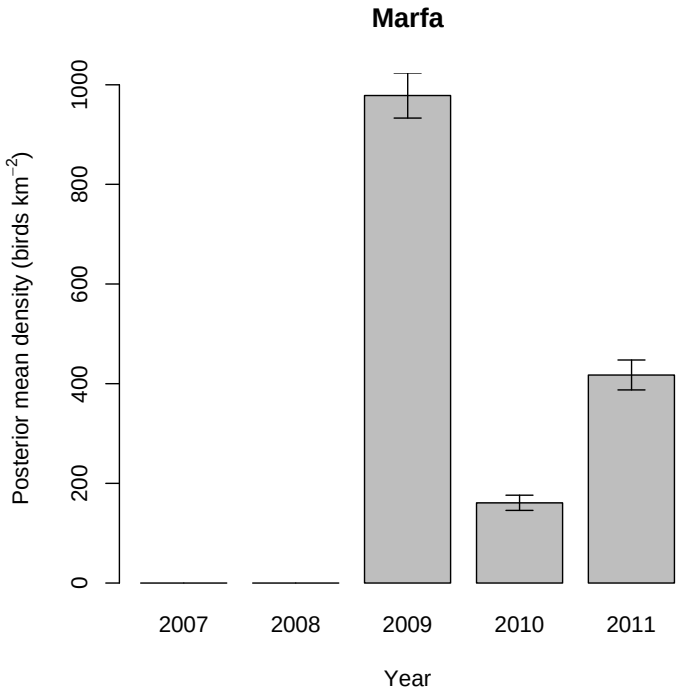


Fig. 22. Annual posterior mean bird density and standard deviation in Marfa Grassland Priority Conservation Area.

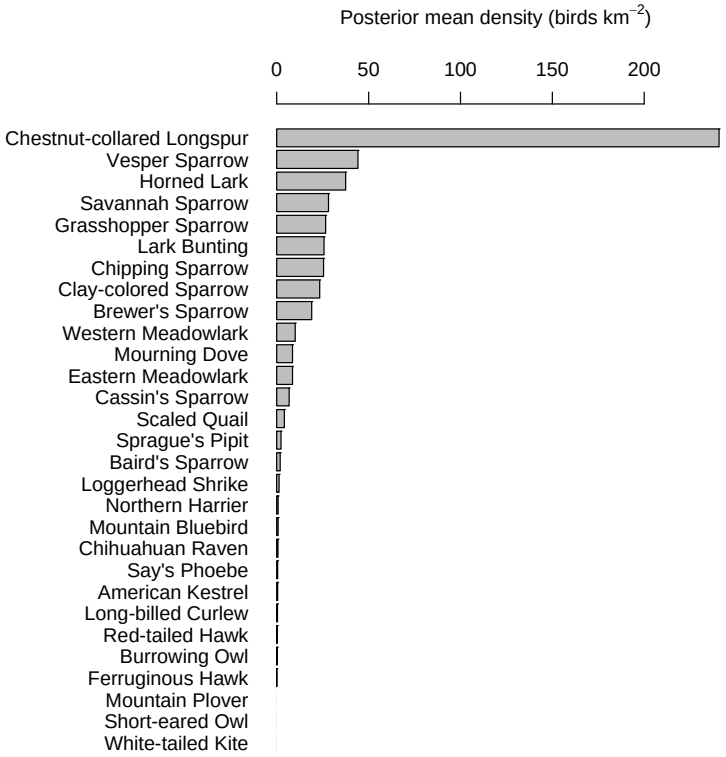


Fig. 23. Three-year average density of wintering grassland bird species in Marfa GPCA (2007-2011).

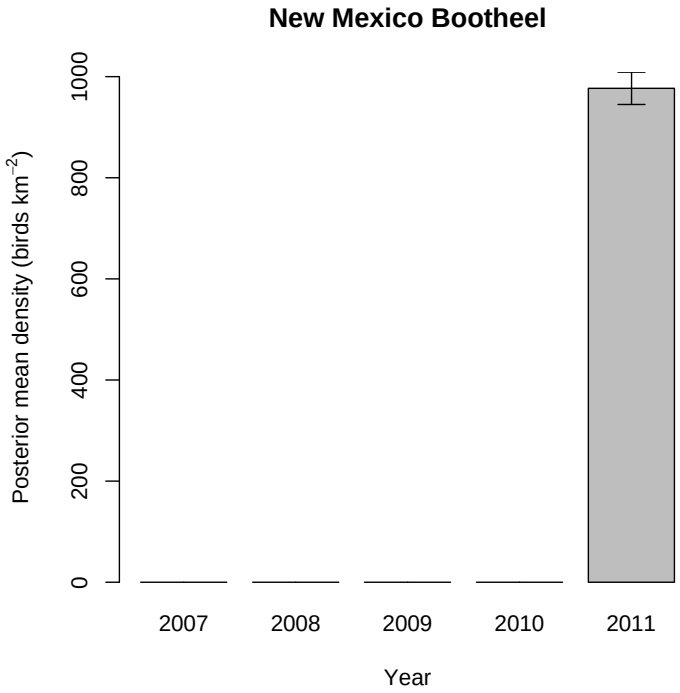


Fig. 24. Annual posterior mean bird density and standard deviation in Malpaís Grassland Priority Conservation Area.

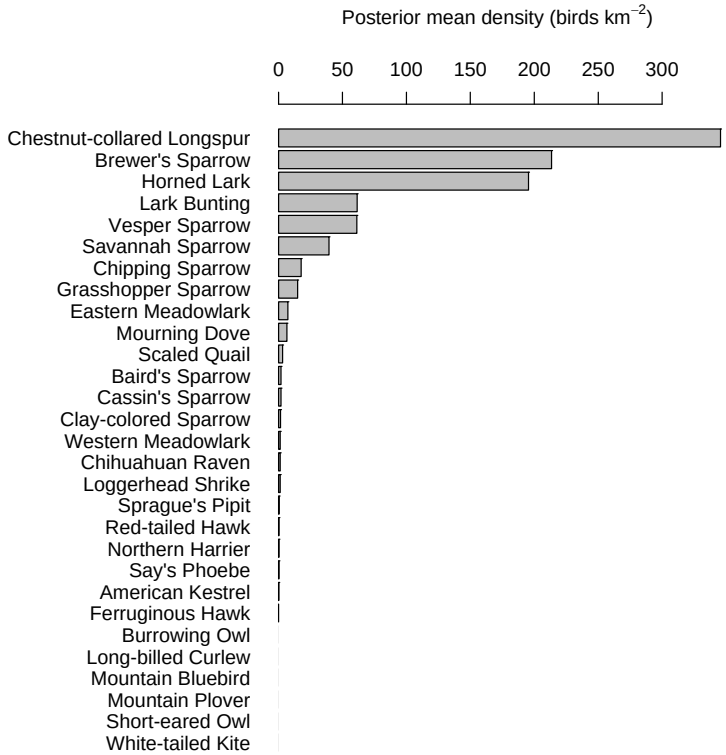


Fig. 25. Average density of wintering grassland bird species in New Mexico Bootheel GPCA (2011).

Otero Mesa

Otero Mesa was incorporated in 2011 into our large-scale monitoring effort throughout the Chihuahuan Desert, and therefore with only one year of abundance data, we cannot fully characterize species presence, abundance and composition. Otero Mesa appears to be an area of conservation importance for grassland birds, ranking second in annual bird abundance after Cuchillas de la Zarca, with 1082.4 birds km^{-2} (Figs. 5 and 26). The large density of grassland birds observed in this area does not correspond to a relatively large diversity. Species richness (21 species) and species diversity ($H = 2.69$) in Otero Mesa is among the lowest, ranking 15th and 16th among GPCAs, respectively. Most of the species abundance reflects Chestnut-collared Longspur, which represents 74.6% of the relative density, followed by Horned Lark (9.8%), Brewer's Sparrow (4.9%), Chipping Sparrow (4.2%) and Lark Bunting (2.2%, Fig. 27). In addition, 13 out of the 29 grassland bird focal species were not observed in our line transects in Otero Mesa, including Sprague's Pipit, Burrowing Owl, Cassin's Sparrow, Say's Phoebe, and Scaled Quail. Nevertheless, Otero Mesa is an area of conservation importance to Chestnut-collared Longspurs, which attained its maximum annual density in this GPCA. Otero Mesa shows affinity in species composition to Armendaris to form the *Northern* region. This affinity is mainly due to the dominance of Chestnut-collared Longspur in both areas.

Sonoita

Sonoita shows a relatively low abundance of grassland birds, with a mean annual density of 526.3 birds km^{-2} ranking only above Armendaris, Cuatro Ciénegas, Marfa and El Tokio (Fig. 5). Sonoita did not show the recurrent pattern of maximum bird abundance in 2009 as other GPCAs (Fig. 4), but rather shows a declining trend since 2008 when monitoring of this GPCA started (Fig. 28). However, sampling on the U.S. side of this binational GPCA began only in 2011, thus estimates for this area should be interpreted with caution.

Sonoita harbors intermediate levels of diversity in its wintering bird community among GPCAs, with a species richness of 87 species (24 species above the average) and species diversity of $H = 4.67$, ranking 5th among all GPCAs in both parameters. Dominance in species abundance is shared by Vesper Sparrow and Chestnut-collared Longspur, both accounting for the 40.1% of the total density, although their densities here are considerably lower than in some other GPCAs (Fig. 29). Other grassland birds wintering in the area in significant numbers include Northern Harrier and Eastern Meadowlark which occur in their highest density here relative to other GPCAs (Appendix B). Other grassland birds of interest include six Aplomado Falcons observed here in early 2010, likely wandering birds from adjacent states, as none are known to nest here. Absent species from our survey transects include Burrowing Owl, Ferruginous Hawk, Mountain Bluebird and Short-eared Owl.

Sonoita has a closer affinity in species composition to Valles Centrales and not to its neighboring GPCAs Sulphur Springs and New Mexico Bootheel. This affinity may be mainly due to the relative importance of both Vesper Sparrow and Chestnut-collared Longspur in their winter avifauna.

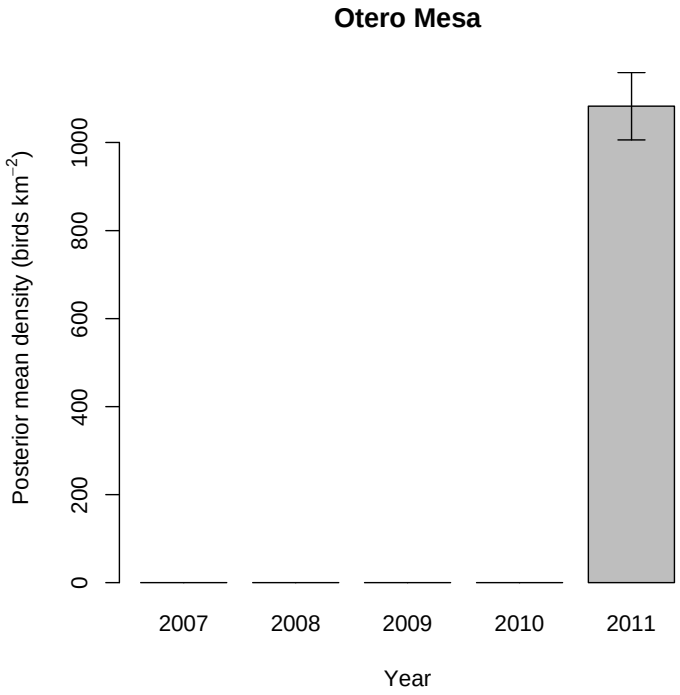


Fig. 26 Annual posterior mean bird density and standard deviation in Malpaís Grassland Priority Conservation Area.

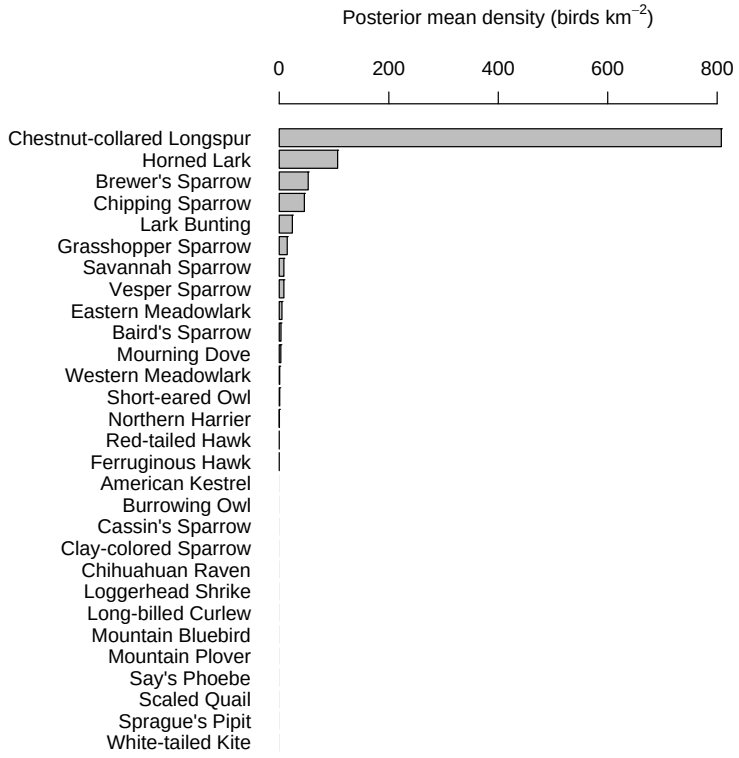


Fig. 27. Average density of wintering grassland bird species in Otero Mesa GPCA (2011).

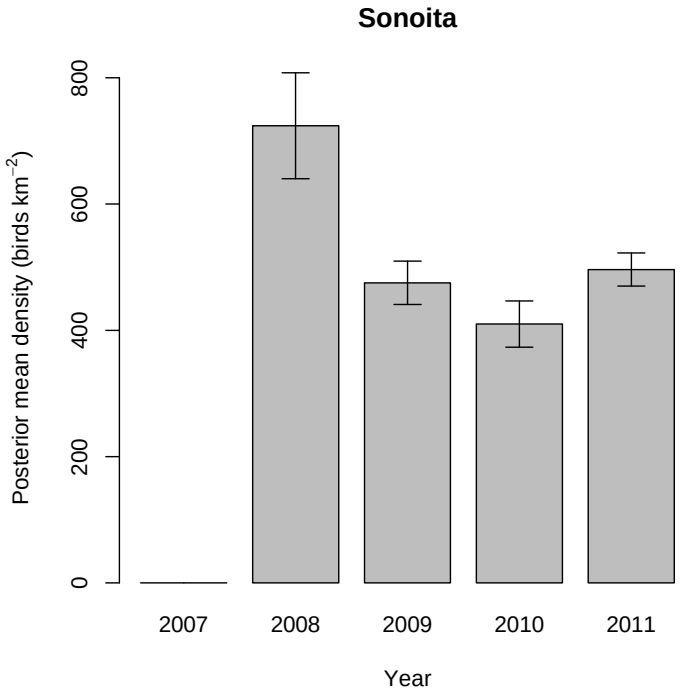


Fig. 28 Annual posterior mean bird density and standard deviation in Sonoita Grassland Priority Conservation Area.

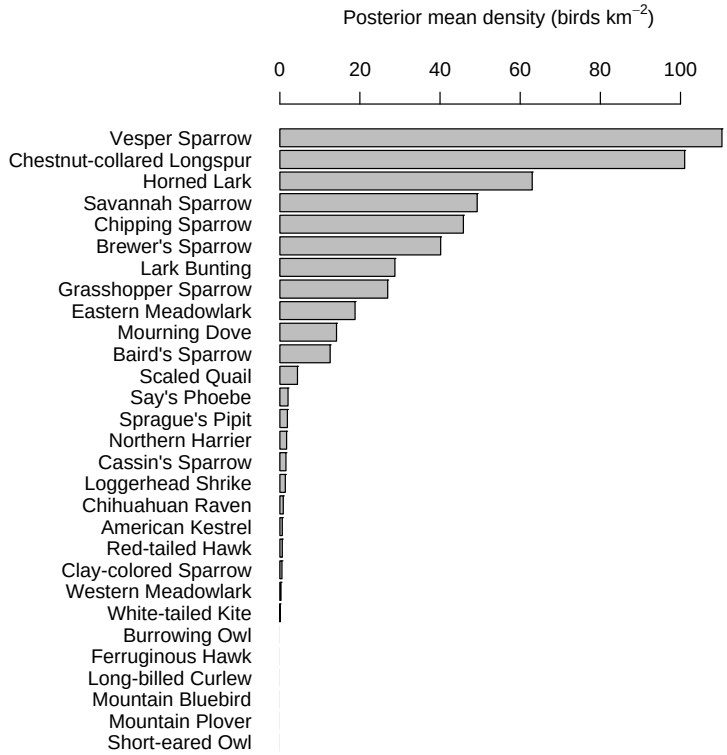


Fig. 29. Four-year average density of wintering grassland bird species in Sonoita GPCA (2008-2011).

Sulphur Springs

Sulphur Springs is among the GPCAs added in 2011. Again, we have not fully characterized species presence, abundance and composition with only one year of sampling. Sulphur Springs harbors winter bird densities near the average density across GPCAs, with 715.1 birds km^{-2} (Figs. 5 and 30).

Sulphur Springs has intermediate levels of diversity in its wintering bird community among GPCAs with a species richness of 55 species (8 species below the average) and species diversity of $H = 4.15$, ranking 10th and 9th among all GPCAs, respectively. Vesper Sparrow and Brewer's Sparrows are co-dominant species in this GPCA, both accounting for 52.3% of the species abundance, followed by Lark Bunting, Savannah Sparrow and Chipping Sparrow (Fig. 31). These five sparrow species account for 77.7% of the total bird density. Sulphur Springs (and its neighboring GPCA New Mexico Bootheel) is apparently an area of conservation importance for Brewer's Sparrow where the species attains a relatively large density. Grassland species undetected in our bird surveys include Baird's Sparrow, Sprague's Pipit, Burrowing Owl, Mountain Bluebird, Short-eared Owl and White-tailed Kite. As mentioned before, Sulphur Springs species composition is more similar to that of New Mexico Bootheel, it's neighboring GPCA.

El Tokio

El Tokio GPCA is one of the largest Chihuahuan Desert GPCAs, encompassing nearly 9,364 km^2 of Chihuahuan Desert shrubland, grasslands, woodlands and croplands in the borderlands region of southern Coahuila, southwestern Nuevo Leon, northeastern Zacatecas and northern San Luis Potosí (Figure 1). El Tokio grasslands are well-known for being the only home of the Mexican prairie dog (*Cynomys mexicanus*), which in turn supports a large assemblage of wintering prairie dog associated species, including Long-billed Curlew, Mountain Plover and Burrowing Owl. Threats to grasslands in El Tokio include conversion to cropland and excessive grazing pressure. El Tokio grasslands are primarily gypsophytic grasslands (80%), which tend to be short-statured and sparsely vegetated. El Tokio shows one of the lowest grassland bird densities among GPCAs, with an average annual density of 399.7 bird km^{-2} (Figs. 5), only higher than that of Armendaris and Cuatro Ciénegas. No trend in grassland bird density is apparent from our annual density estimates, although the minimum density was observed in 2011 (Fig. 32), when the region underwent a severe drought. With an average density of 301.3 birds km^{-2}, Horned Larks comprise 75.8% of all grassland birds in El Tokio. Although species richness is at intermediate level in this GPCA (60 species) ranking 9th, the large dominance of Horned Larks reduces species diversity ($H = 3.31$) and ranks El Tokio 14th in this latter parameter. Savannah Sparrow, Lark Bunting, Vesper Sparrow and Sprague's Pipit are the next most abundant species, accounting for only an additional 10.7% of the relative density (Fig. 33). Despite its low species diversity, El Tokio is an area of particular conservation importance to Sprague's Pipit, Ferruginous Hawk and Mountain Plover, which occur in their maximum densities (Appendix B). In addition, El Tokio harbors the endemic Worthen's Sparrow, with 179 birds observed by field crews as part of this project. Baird's Sparrow, Short-eared Owl, and White-tailed Kite were not recorded in our surveys at this GPCA.

El Tokio and Cuatro Ciénegas show the greatest affinity in bird species composition among all groups of GPCAs, mainly due to the fact that Horned Larks are the dominant species at both GPCAs.

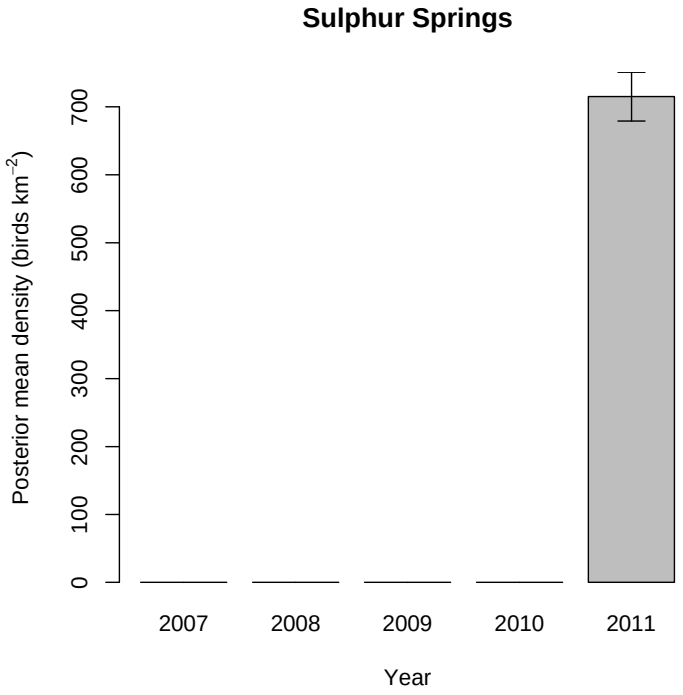


Fig. 30. Annual posterior mean bird density and standard deviation in Sulphur Springs Grassland Priority Conservation Area.

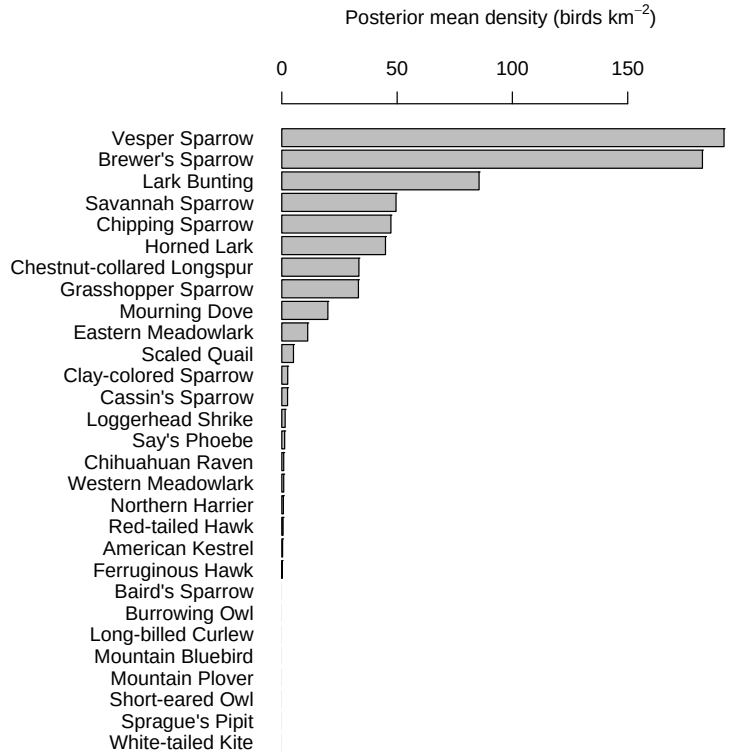


Fig. 31. Average density of wintering grassland bird species in Sulphur Springs GPCA (2011).

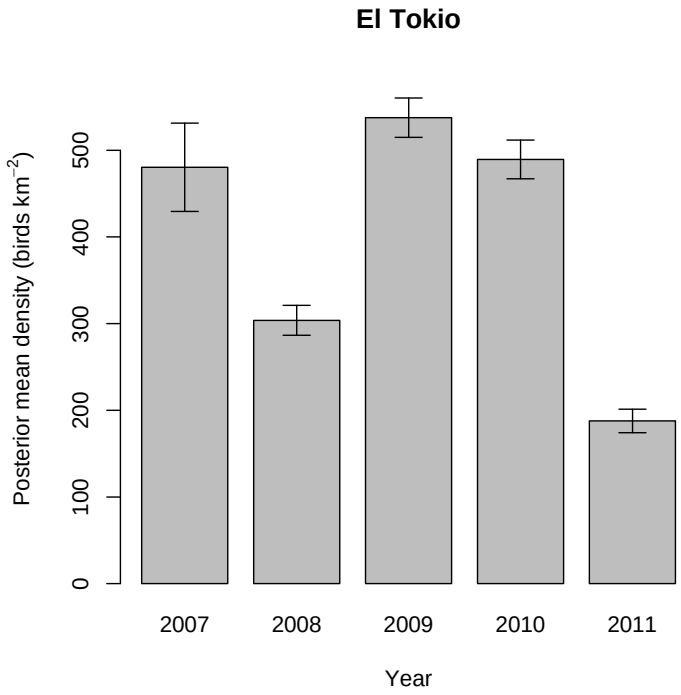


Fig. 32. Annual posterior mean bird density and standard deviation in El Tokio Grassland Priority Conservation Area.

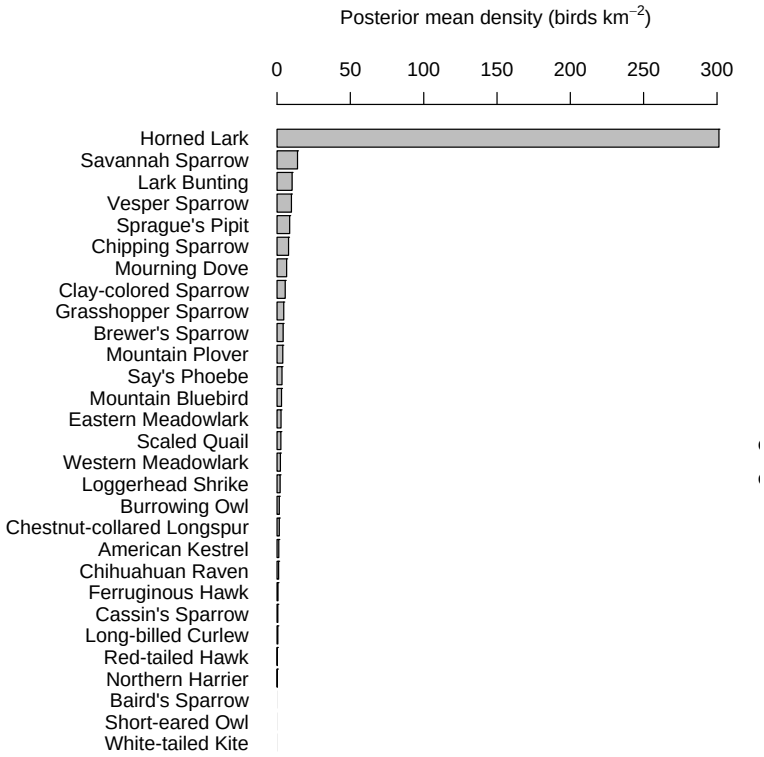


Fig. 33. Five-year average density of wintering grassland bird species in El Tokio GPCA (2007-2011)**.**

Valle Colombia

Valle Colombia harbors a near-average density of wintering grassland bird populations, with an average annual density of 601.8 birds km^{-2} (Fig. 5). Valle Colombia shows the typical annual trend in bird abundance, with a peak for the winter of 2009 (1492.8 birds km^{-2}) and low densities otherwise (Figs. 4 and 34). Valle Colombia has a relatively low species diversity (54 species, 9 species below the average) and low diversity index (H = 3.52). Savannah Sparrow and Vesper Sparrow are co-dominant species, accounting for 67.7% of the relative density, followed by Grasshopper Sparrow, Chestnut-collared Longspur, and Lark Bunting. These 5 species account for 84.7% of the total relative density in Valle Colombia. Valle Colombia has supported the highest average densities of Savannah Sparrows among any GPCA, with 615.1 birds km^{-2} in 2009. Vesper and Grasshopper Sparrow densities have also been exceptionally high in Valle Colombia. Despite its northerly location, Chestnut-collared Longspur densities have been relatively low (Fig. 35). Other grasslands species found in high abundance in this GPCA include American Kestrel, Cassin's Sparrow, Sprague's Pipit, Mountain Bluebird and Eastern Meadowlark. Species absent from our bird surveys in Valle Colombia include Long-billed Curlew, Mountain Plover, Burrowing Owl and White-tailed Kite. Because only 1 sampling block with 6 km of transect was retained from 2007, little weight should be given to results from that year. Valle Colombia winter avifauna show its closest affinity to Marfa GPCA in West Texas (Fig. 2).

Valles Centrales

Valles Centrales is the largest GPCA in Mexico, encompassing 10,316 km^2 of Chihuahuan Desert shrubland, grassland, woodland and cropland in central Chihuahua (Figure 1). Clearing of native grassland for new croplands is expanding rapidly in Valles Centrales and threatens to greatly reduce habitat available to a large number of grassland species (Macias-Duarte et al. 2009, Panjabi et al. 2010b). In addition, Valles Centrales harbors the last known native populations of desert-dwelling Aplomado Falcons in North America (Montoya et al. 1997, Macias-Duarte et al. 2004), which is threatened with imminent extirpation due to the agricultural expansion within the Valles Centrales.

Valles Centrales has a diverse winter avifauna with 91 species recorded in transects (28 species above the GPCA average) ranking 4th among all GPCAs. Valles Centrales harbors wintering grassland birds at densities similar to the average density across GPCAs (Fig. 5) with an average annual density of 673.4 birds km^{-2}. Bird density reached its maximum in 2007 at 1026.1 birds km^{-2}, dropped 75% in 2008, and then continued increasing to reach 824.3 birds km^{-2} in 2011 (Fig. 36). These densities are comparable to those reported by Macias-Duarte et al. (2009) in the area, although density increased to nearly 7 times this level of bird density in the winter of 2005 (not covered in our study), which was preceded by a year of extraordinarily high summer precipitation. This result shows that Valles Centrales, as well as other GPCAs can hold even larger densities of grassland birds than the estimates reported here. Therefore, large inter-annual variation in bird species abundance in Valles Centrales suggest the need for long-term studies to accurately characterize grassland bird use in any given area.

Species diversity (91 species recorded) and Shannon-Weaver diversity index (H = 4.35) are at intermediate levels in Valles Centrales. On average, Chestnut-collared Longspur is the most abundant species in Valles Centrales, accounting for 36.9% of the total density, followed by Vesper Sparrow, Brewer's Sparrow, Savannah Sparrow and

Horned Lark (Fig. 37). Macias-Duarte et al. (2009) reported a larger representation of Lark Bunting and Horned Lark in the area. No grassland bird species reached its maximum density in this GPCA. Other birds of note found here in significant numbers include Northern Harrier, Prairie Falcon, Merlin, Golden Eagle, Short-eared Owl, Burrowing Owl, Sandhill Crane, Loggerhead Shrike, Cassin's Sparrow, Clay-colored Sparrow and McCown's Longspur. Mountain Plover is the only grassland species absent from our transects in Valles Centrales.

Valles Centrales shows a closer affinity in species composition to Sonoita rather than to neighboring GPCAs. The presence of Aplomado Falcons, a strict grassland-obligate species (Macias-Duarte et al. 2004), in both Sonoita and Valles Centrales supports that the grouping identified by our cluster analysis corresponds to convergence in ecological conditions.

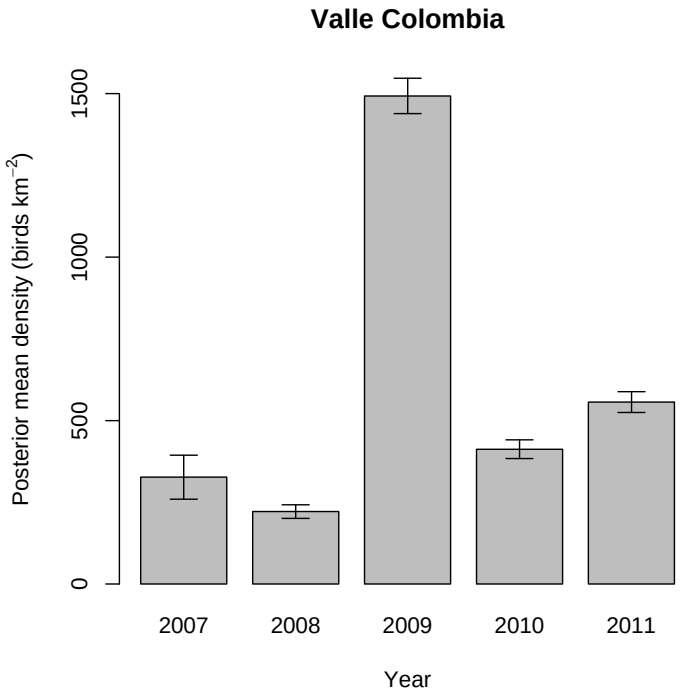


Fig. 34 Annual posterior mean bird density and standard deviation in Sulphur Springs Grassland Priority Conservation Area.

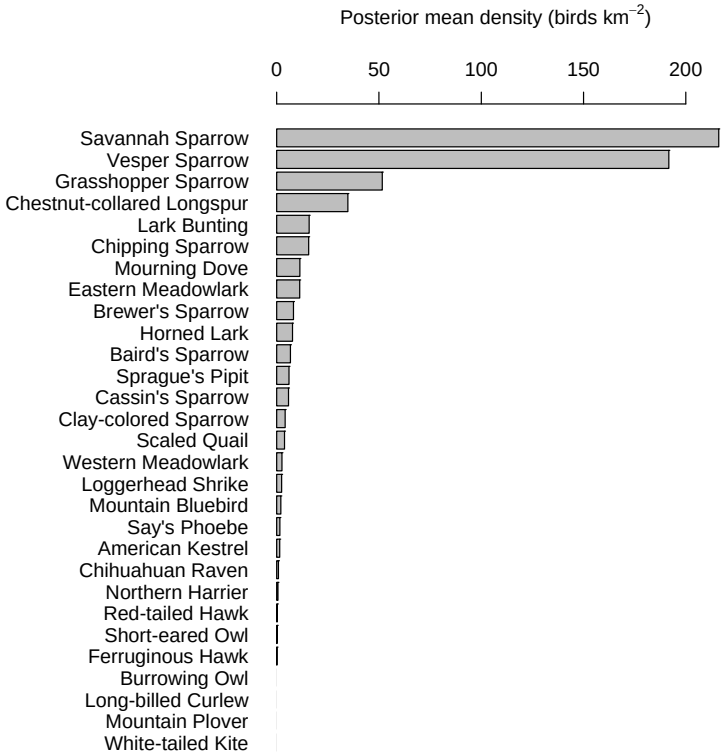


Fig. 35. Five-year average density of wintering grassland bird species in Valle Colombia GPCA (2007-2011)**.**

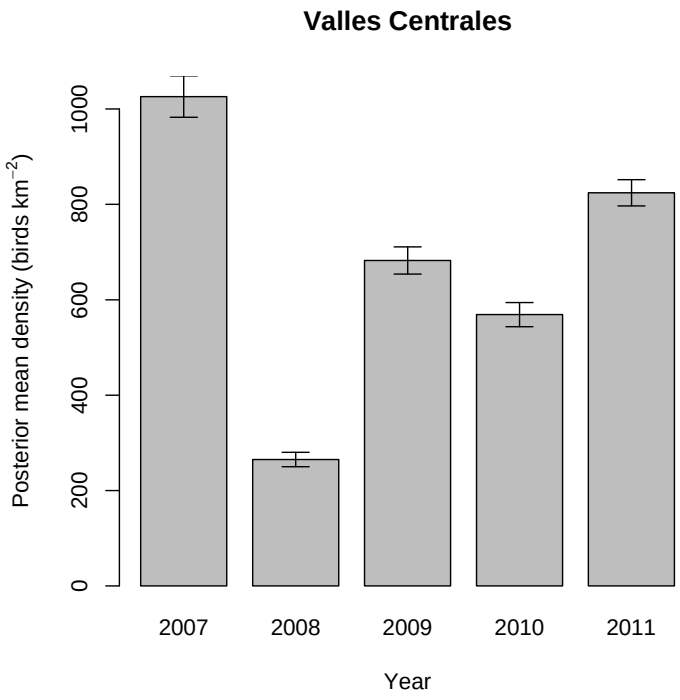


Fig. 36. Annual posterior mean bird density and standard deviation in Valles Centrales Grassland Priority Conservation Area.

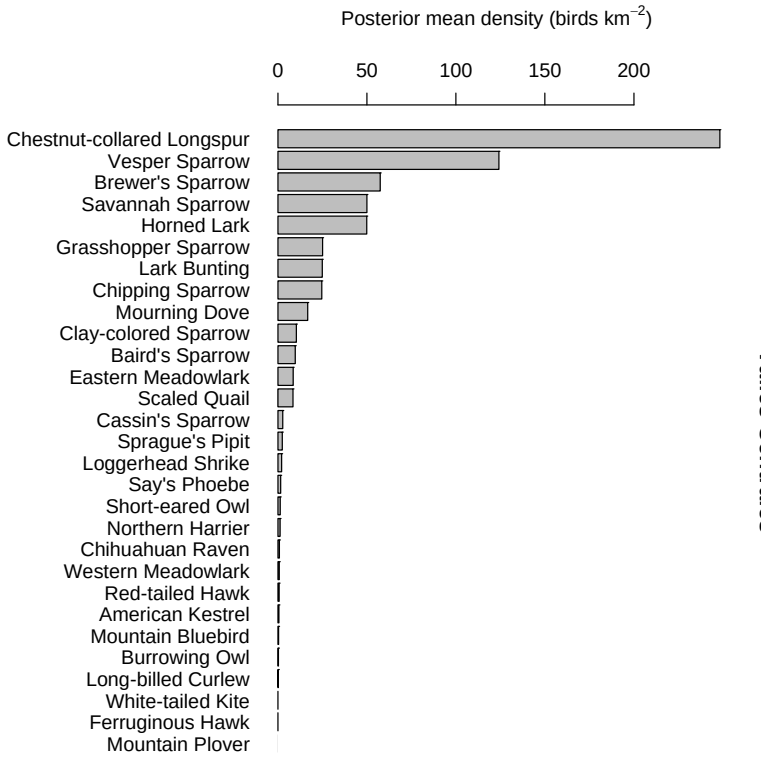


Fig. 37. Five-year average density of wintering grassland bird species in Valles Centrales GPCA (2007-2011)**.**

Concluding remarks

Winter grassland bird communities throughout the Chihuahuan Desert are highly variable in abundance and composition from winter to winter. Bird densities may change in orders of magnitude at the GPCA level and bird species may reach their maxima at different GPCAs in different years. These results suggest that migratory grassland birds have low site fidelity in the wintering grounds and their movement may be largely governed by annual changes in the distribution of resources required for winter survival. Food limitation has been hypothesized to be the primary factor driving bird distribution in Chihuahuan Desert grasslands during the winter (Dunning and Brown 1982, Macias-Duarte et al. 2009), which in turn may be largely governed by summer precipitation. In this regard, this project is providing valuable information that will enable us to further explore, among other topics, the influence of climate, particularly precipitation, in the abundance and distribution of grassland birds in winter and the consequences of climate change for the persistence of grassland birds in North America. However, large annual variability in species distribution throughout the Chihuahuan Desert poses a challenge to the conservation of grassland birds since no subset of GPCAs may suffice to protect all species.

In spite of the large annual variability in grassland bird abundance, some patterns are evident. Most of the species abundance (>50%) resides in less than 5 species for all GPCAs, a recurrent pattern that has been identified in other studies (Manzano-Fischer et al. 1999, Macias-Duarte et al. 2009). Dominant species at GPCAs include Chestnut-collared Longspur, Lark Bunting, Vesper Sparrow, Horned Lark, Brewer Sparrow, and Savannah Sparrow. All these species have significant declining trends in their breeding grounds according to the North American Breeding Bird Survey. Analysis of biodiversity measures, mainly species richness and Shannon's diversity index show that in order to optimize biodiversity conservation, Cuchillas de la Zarca, Janos, and Malpaís should be effectively protected. These 3 GPCAs have the highest species richness and since they belong to different clusters of GPCAs (as identified by our hierarchical cluster analysis, Fig. 2), protection of different grassland bird guilds can be achieved. Furthermore, protection of El Tokio and Valles Centrales must also be sought since these GPCAs harbor important populations of federally-recognized threatened and endangered birds and other wildlife in Mexico, including Aplomado Falcon, Mountain Plover, Mexican prairie dog, Pronghorn and others (SEMARNAT 2010).

This research has also demonstrated that there is a strong relationship between vegetation structure and bird species abundance in Chihuahuan Desert grasslands (Panjabi et al. 2010a). These relationships have allowed us to develop species' habitat models to predict bird abundance in relation to changes in grassland conditions. Information generated by this project on five priority bird species' habitat needs will soon be available to land managers and ranchers interested in improving range conditions for grassland bird conservation through Rocky Mountain Bird Observatory (rmbo.org) and Rio Grande Joint Venture (rgjv.org). Incorporating new data (from 2012 and beyond) and further refining our modeling approaches will enable us to set guidelines for habitat management to achieve target population levels.

Literature cited

Buckland, S. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, USA.

Buckland, S. T., D. R. Anderson, K. P. Burnham, J. L. Laake, D. L. Borchers, and L. Thomas. 2001. Introduction to Distance Sampling: Estimating Abundance of Biological Populations. Oxford University Press.

Ceballos, G., A. Davidson, R. List, J. Pacheco, P. Manzano-Fischer, G. Santos-Barrera, and J. Cruzado. 2010. Rapid Decline of a Grassland System and Its Ecological and Conservation Implications. Plos One 5:e8562. doi:8510.1371/journal.pone.0008562.

Desmond, M. J., K. E. Young, B. C. Thompson, R. Valdez, and A. Lafón-Terrazas. 2005. Habitat associations and conservation of grassland birds in the Chihuahuan Desert Region: Two cases studies in Chihuahua. Pages 439-451 *in* J.-L. E. Cartron, G. Ceballos, andR. S. Felger, editors. Biodiversity, Ecosystems, and Conservation in Northern Mexico. Oxford University Press, New York.

Dunning, J. B., and J. H. Brown. 1982. Summer Rainfall and Winter Sparrow Densities - a Test of the Food Limitation Hypothesis. Auk 99:123-129.

Everitt, B. S., S. Landau, M. Leese, and D. Stahl. 2011. Cluster Analysis. 5th edition. John Wiley & Sons.

INEGI. 2003. Carta de uso actual del suelo y vegetación Serie III. *in* México.

Instituto Nacional de Estadistica Geografia e Informatica. 2005. Carta de Uso del Suelo y Vegetación, 1:250 000. Serie III. Instituto Nacional de Estadística, Geografía e Informática, Aguascalientes, Mexico.

Krebs, C. J. 2009. Ecology: the experimental analysis of distribution and abundance. 6th. ed. edition. Pearson Benjamin Cummings, San Francisco, U.S.A.

Levandoski, G., A. Panjabi, and R. Sparks. 2009. Wintering Bird Inventory and Monitoring in Priority Conservation Areas in Chihuahuan Desert Grasslands in Mexico: 2008 results. Rocky Mountain Bird Observatory.

Lunn, D. J., A. Thomas, N. Best, and D. Spiegelhalter. 2000. WinBUGS - A Bayesian modelling framework: Concepts, structure, and extensibility. Statistics and Computing 10:325-337.

Macias-Duarte, A., A. B. Montoya, W. G. Hunt, A. Lafon-Terrazas, and R. Tafanelli. 2004. Reproduction, prey, and habitat of the Aplomado Falcon (Falco femoralis) in desert grasslands of Chihuahua, Mexico. Auk 121:1081-1093.

Macias-Duarte, A., A. B. Montoya, C. E. Mendez-Gonzalez, J. R. Rodriguez-Salazar, W. G. Hunt, and P. G. Krannitz. 2009. Factors Influencing Habitat Use by Migratory Grassland Birds in the State of Chihuahua, Mexico. Auk 126:896-905.

Manzano-Fischer, P., R. List, and G. Ceballos. 1999. Grassland Birds in Prairie-dog Towns in Northwestern Chihuahua, Mexico. Studies on Avian Biology 19.

Manzano-Fischer, P., R. List, G. Ceballos, and J. L. E. Cartron. 2006. Avian diversity in a priority area for conservation in North America: the Janos-Casas Grandes Prairie Dog Complex and adjacent habitats in northwestern Mexico. Biodiversity and Conservation 15:3801-3825.

Montoya, A. B., P. J. Zwank, and M. Cardenas. 1997. Breeding biology of Aplomado Falcons in desert grasslands of Chihuahua, Mexico. Journal of Field Ornithology 68:135-143.

Panjabi, A., G. Levandoski, and R. Sparks. 2007. Wintering Bird Inventory and Monitoring in Priority Conservation Areas in Chihuahuan Desert Grasslands in Mexico: 2007 pilot results. Rocky Mountain Bird Observatory, Brighton, CO, Final technical report IMXPLAT-TNC-07-01:72.

Panjabi, A., G. Levandoski, and R. Sparks. 2010a. Wintering Bird Density and Habitat Use in Chihuahuan Desert Grasslands. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report I-MXPLAT-08-02. 118 pp.

Panjabi, A., E. Youngberg, and G. Levandoski. 2010b. Wintering Grassland Bird Density in Chihuahuan Desert Grassland Priority Conservation Areas, 2007-2010. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report I-MXPLAT-08-03.

Pool, D., and A. Panjabi. 2011. Assessment and Revisions of North American Grassland Priority Conservation Areas, Background Paper Commission for Environmental Cooperation.

R Development Core Team. 2009. R Foundation for Statistical Computing, Viena, Austria.

Royle, J. A., and R. M. Dorazio. 2008. Hierarchical modeling and inference in ecology. Analysis of data from populations, metapopulations and communities. Elsevier, San Diego, California.

Samson, F., and F. Knopf. 1994. Prairie conservation in North America. BioScience 44:418–421.

SEMARNAT. 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección ambiental -Especies nativas de México de flora y fauna silvestres -Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio -Lista de especies en riesgo. *in* Diario Oficial de la Federación. December 30.

Shannon, C. E., and W. Weaver. 1949. The Mathematical Theory of Communication. University of Illinois Press, Urbana, U.S.A.

Spiegelhalter, D., A. Thomas, N. Best, and W. Gilks. 1996. BUGS 0.5: Bayesian inference Using Gibbs Sampling–Manual (version ii). Medical Research Council Biostatistics Unit, Cambridge, U.K.

Sturtz, S., U. Ligges, and A. Gelman. 2005. R2WinBUGS: A package for running WinBUGS from R. Journal of Statistical Software 12:1-16.

Vickery, P. D., P. L. Tubaro, J. M. C. d. Silva, B. G. Peterjohn, J. R. Herkert, and R. B. Cavalcanti. 1999. Conservation of Grassland Birds in the Western Hemisphere. *in* P. D. Vickery, andJ. R. Herkert, editors. Ecology and Conservation of Grassland Birds of the Western Hemisphere. Studies in Avian Biology No. 19, pp. 2-26. .

Appendix A. Numbers of bird species observed in each GPCA from 2007-2011

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpaís	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Black-bellied Whistling-Duck	*Dendrocygna autumnalis*	**2009**															2		**2**	**0.02**
Greater White-fronted Goose	*Anser albifrons*	**2009**			5192														**5192**	**39.67**
		2011			78														**78**	**0.57**
Snow Goose	*Chen caerulescens*	**2008**			2036	193													**2229**	**39.29**
		2009			2985	1											105		**3091**	**23.62**
		2010			817	6													**823**	**8.62**
		2011			4786														**4786**	**34.94**
Ross's Goose	*Chen rossii*	**2010**			14														**14**	**0.15**
		2011			6														**6**	**0.04**
Gadwall	*Anas strepera*	**2007**			55														**55**	**1.43**
		2008			4														**4**	**0.07**
		2009			17														**17**	**0.13**
		2010			23														**23**	**0.24**
		2011			13				11										**24**	**0.18**
American Wigeon	*Anas americana*	**2008**			7														**7**	**0.12**
		2009				6								1					**7**	**0.05**
		2010				2													**2**	**0.02**
Mallard	*Anas platyrhynchos*	**2007**				4											21		**25**	**0.65**
		2008				1													**1**	**0.02**
		2009				2								3					**5**	**0.04**
		2010				7								10					**17**	**0.18**
		2011				6								13			11		**30**	**0.22**
Blue-winged Teal	*Anas discors*	**2007**			2														**2**	**0.05**
Cinnamon Teal	*Anas cyanoptera*	**2011**							6										**6**	**0.04**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpaís	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2007															130		**130**	**3.39**
		2008			35	3													**38**	**0.67**
Northern Shoveler	*Anas clypeata*	**2009**			41									353					**394**	**3.01**
		2010			2				30					7			2		**41**	**0.43**
		2011			58	55								8					**121**	**0.88**
		2007			3														**3**	**0.08**
		2008			2														**2**	**0.04**
Northern Pintail	*Anas acuta*	**2009**			23														**23**	**0.18**
		2010			9				2										**11**	**0.12**
		2011			19														**19**	**0.14**
		2007								18									**18**	**0.47**
		2008			35														**35**	**0.62**
Green-winged Teal	*Anas crecca*	**2009**			71												17		**88**	**0.67**
		2010			22				31										**53**	**0.56**
		2011			54	2			110								8		**174**	**1.27**
		2007								1							1		**2**	**0.05**
	Anas sp.	**2009**			2						1								**3**	**0.02**
		2010			1				1										**2**	**0.02**
Redhead	*Aythya americana*	**2011**			24														**24**	**0.18**
		2008			1														**1**	**0.02**
Ring-necked Duck	*Aythya collaris*	**2009**			23														**23**	**0.18**
		2011			11														**11**	**0.08**
Lesser Scaup	*Aythya affinis*	**2007**															15		**15**	**0.39**
		2008												1					**1**	**0.02**
		2007			1												20		**21**	**0.55**
		2008			40														**40**	**0.71**
Bufflehead	*Bucephala albeola*	**2009**			15														**15**	**0.11**
		2010			4	3													**7**	**0.07**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2011			14	27													**41**	**0.30**
Common Merganser	*Mergus merganser*	**2009**												5					**5**	**0.04**
		2010			1														**1**	**0.01**
		2011			3														**3**	**0.02**
Ruddy Duck	*Oxyura jamaicensis*	**2009**												2					**2**	**0.02**
		2010			5														**5**	**0.05**
Unidentified Duck	Anatidae	**2007**				2											1		**3**	**0.08**
		2008		1		1													**2**	**0.04**
		2009												1					**1**	**0.01**
Scaled Quail	*Callipepla squamata*	**2007**			22	54				9							25		**110**	**2.87**
		2008			186	95				65				2		5	450		**803**	**14.15**
		2009			126	58	42			44	42			14		1	61	10	**398**	**3.04**
		2010			98	53	45			1						10	27		**234**	**2.45**
		2011			37	79	28		26	10	51	8		18	8		19	25	**309**	**2.26**
Gambel's Quail	*Callipepla gambelii*	**2007**				8													**8**	**0.21**
		2008				26								1					**27**	**0.48**
		2009				25													**25**	**0.19**
		2010				11													**11**	**0.12**
		2011	2			5									2		1		**10**	**0.07**
Montezuma Quail	*Cyrtonyx montezumae*	**2009**				4													**4**	**0.03**
		2010			14				11										**25**	**0.26**
		2011									9								**9**	**0.07**
Western Grebe	*Aechmophorus occidentalis*	**2009**			31									1					**32**	**0.24**
Black Storm-Petrel	*Oceanodroma melania*	**2011**												8		5			**13**	**0.09**
Great Blue Heron	*Ardea herodias*	**2009**												1					**1**	**0.01**
		2010			3				3										**6**	**0.06**
		2011			1				2										**3**	**0.02**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Great Egret	*Ardea alba*	**2009**			1									1					**2**	**0.02**
		2010							1										**1**	**0.01**
		2011							4										**4**	**0.03**
Cattle Egret	*Bubulcus ibis*	**2010**							1										**1**	**0.01**
Black-crowned Night-Heron	*Nycticorax nycticorax*	**2010**							4										**4**	**0.04**
		2011							1										**1**	**0.01**
Black Vulture	*Coragyps atratus*	**2008**			7														**7**	**0.12**
		2010								4									**4**	**0.04**
		2011							1										**1**	**0.01**
Turkey Vulture	*Cathartes aura*	**2007**			57	3				13						1			**74**	**1.93**
		2008			135	11				47						1	14		**208**	**3.67**
		2009			51	5	4			56	4					18	1		**139**	**1.06**
		2010			67	15			21	39	2					2	37		**183**	**1.92**
		2011			55	8			29	15						2	10		**119**	**0.87**
White-tailed Kite	*Elanus leucurus*	**2007**			2	3											3		**8**	**0.21**
		2008				11				6							2		**19**	**0.33**
		2009					5			4							1		**10**	**0.08**
		2010					2		1	3				1					**7**	**0.07**
		2011					1							4					**5**	**0.04**
Bald Eagle	*Haliaeetus leucocephalus*	**2010**				1													**1**	**0.01**
		2011				2								1	1				**4**	**0.03**
Northern Harrier	*Circus cyaneus*	**2007**			3	34				9							34		**80**	**2.08**
		2008		1	12	76				22				13		5	60	1	**190**	**3.35**
		2009			17	44	42			32	30			14		7	39	17	**242**	**1.85**
		2010			26	10	21		11	36	9			13		2	24	4	**156**	**1.63**
		2011	1		26	18	18		2	6	9	9	1	19	15	2	29	6	**161**	**1.18**
Sharp-shinned Hawk	*Accipiter striatus*	**2007**			1														**1**	**0.03**
		2008			1	1													**2**	**0.04**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2009															1		**1**	**0.01**
		2010			1	1				2							1		**5**	**0.05**
		2011				2									1				**3**	**0.02**
		2007			1														**1**	**0.03**
		2008			2	1				1									**4**	**0.07**
Cooper's Hawk	*Accipiter cooperii*	**2009**			3	1	4												**8**	**0.06**
		2010			3		2												**5**	**0.05**
		2011			1	1	1										1		**4**	**0.03**
		2007			5	2											1		**8**	**0.21**
		2008			5	15				1									**21**	**0.37**
Harris's Hawk	*Parabuteo unicinctus*	**2009**			3												2	2	**7**	**0.05**
		2010			2	3				3							1		**9**	**0.09**
		2011				1			3										**4**	**0.03**
		2007				2													**2**	**0.05**
		2008				1								1					**2**	**0.04**
Unidentified Hawk		**2009**				1				3				1					**5**	**0.04**
		2011	1			1													**2**	**0.01**
White-tailed Hawk	*Buteo albicaudatus*	**2010**							2										**2**	**0.02**
		2007		1	6	14				2							23	1	**47**	**1.22**
		2008		1	32	22				13				4		6	34	2	**114**	**2.01**
Red-tailed Hawk	*Buteo jamaicensis*	**2009**			13	10	14			10	9			8		7	18	4	**93**	**0.71**
		2010			15	9	10		17	12	6			9		2	13	1	**94**	**0.98**
		2011	1		8	14	8		9	1	2	10	1	4	9	4	16		**87**	**0.64**
		2007				1										1	1		**3**	**0.08**
		2008			2	7										12			**21**	**0.37**
Ferruginous Hawk	*Buteo regalis*	**2009**			6	3					1					25	2	1	**38**	**0.29**
		2010				6	2		2	1	2					16		2	**31**	**0.32**
		2011				6	1			1	2	1	2		1	9	5	3	**31**	**0.23**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2008			2	1				1						1	1		**6**	**0.11**
	Buteo sp.	**2009**					2				1			1		1			**5**	**0.04**
		2010				1										1		2	**4**	**0.04**
		2008				2								2					**4**	**0.07**
Golden Eagle	*Aquila chrysaetos*	**2009**				1					2					3	3		**9**	**0.07**
		2010				1				1	1			2					**5**	**0.05**
		2011				4				3	1	5				2	2	1	**18**	**0.13**
Crested Caracara	*Caracara cheriway*	**2009**														3			**3**	**0.02**
		2010														4			**4**	**0.04**
		2007			8	16				5						2	15		**46**	**1.20**
		2008		2	37	23				10				3		17	16	10	**118**	**2.08**
American Kestrel	*Falco sparverius*	**2009**		1	46	15	17			33	17			6		18	15	28	**196**	**1.50**
		2010			35	7	8		15	21	1					22	11	13	**133**	**1.39**
		2011			28	11	5	1	12	5	3	2		11	3	13	15	5	**114**	**0.83**
		2007			6	4											2		**12**	**0.31**
		2008			5												1		**6**	**0.11**
Merlin	*Falco columbarius*	**2009**			4					2							1		**7**	**0.05**
		2010			2	1			2	1									**6**	**0.06**
		2011	1		4	1	1					2			1		1		**11**	**0.08**
		2008															3		**3**	**0.05**
Aplomado Falcon	*Falco femoralis*	**2009**															2		**2**	**0.02**
		2010												6			3		**9**	**0.09**
		2011					1										2		**3**	**0.02**
Peregrine Falcon	*Falco peregrinus*	**2009**		1			2							1					**4**	**0.03**
		2011					1												**1**	**0.01**
		2007			1	1											2		**4**	**0.10**
Prairie Falcon	*Falco mexicanus*	**2008**			2	3				3							3		**11**	**0.19**
		2009			1		7				1						1		**10**	**0.08**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpaís	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2010					2			2						1	2		**7**	**0.07**
		2011			1	1	1			3		2	1		1	1	3	1	**15**	**0.11**
American Coot	*Fulica americana*	**2008**			4														**4**	**0.07**
		2009			15														**15**	**0.11**
		2010			86														**86**	**0.90**
		2011			229				1										**230**	**1.68**
Sandhill Crane	*Grus canadensis*	**2007**			163	3				186									**352**	**9.17**
		2008		431		416				1									**848**	**14.95**
		2009		69		306				13									**388**	**2.96**
		2010		81	69	895			280								896		**2221**	**23.26**
		2011			32	4			70	1431		123		7	7		156		**1830**	**13.36**
Killdeer	*Charadrius vociferus*	**2007**				1													**1**	**0.03**
		2008			10	2								2					**14**	**0.25**
		2009		1	18	2					2			1					**24**	**0.18**
		2010		5	5				4					4					**18**	**0.19**
		2011			14	4			46					10			5		**79**	**0.58**
Mountain Plover	*Charadrius montanus*	**2007**														8			**8**	**0.21**
		2008				23										33			**56**	**0.99**
		2009														9			**9**	**0.07**
		2010														41			**41**	**0.43**
		2011														15			**15**	**0.11**
Black-necked Stilt	*Himantopus mexicanus*	**2010**							4										**4**	**0.04**
American Avocet	*Recurvirostra americana*	**2007**															10		**10**	**0.26**
Spotted Sandpiper	*Actitis macularius*	**2008**			12														**12**	**0.21**
Greater Yellowlegs	*Tringa melanoleuca*	**2008**		5	7														**12**	**0.21**
		2009												1					**1**	**0.01**
		2010		4					2										**6**	**0.06**
Long-billed	*Numenius americanus*	**2007**				12				24						2	1		**39**	**1.02**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpaís	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Curlew		**2008**			21	57				13						5			**96**	**1.69**
		2009		7		147	2			1	4								**161**	**1.23**
		2010		14		60				32	12					20			**138**	**1.45**
		2011			5	5				21							17		**48**	**0.35**
Western Sandpiper	*Calidris mauri*	**2009**												17					**17**	**0.13**
Least Sandpiper	*Calidris minutilla*	**2009**			13									33					**46**	**0.35**
		2010			3														**3**	**0.03**
		2011							2										**2**	**0.01**
Stilt Sandpiper	*Calidris himantopus*	**2007**															1		**1**	**0.03**
		2011				6													**6**	**0.04**
Long-billed Dowitcher	*Limnodromus scolopaceus*	**2010**			7				5										**12**	**0.13**
		2011			7				4										**11**	**0.08**
Wilson's Snipe	*Gallinago delicata*	**2010**							1										**1**	**0.01**
		2011			1														**1**	**0.01**
Ring-billed Gull	*Larus delawarensis*	**2010**			1														**1**	**0.01**
		2011			1														**1**	**0.01**
Eurasian Collared-Dove	*Streptopelia decaocto*	**2007**				7													**7**	**0.18**
		2008				9													**9**	**0.16**
		2009			2	8													**10**	**0.08**
		2010				6			1										**7**	**0.07**
		2011				8													**8**	**0.06**
White-winged Dove	*Zenaida asiatica*	**2007**			10												1	1	**12**	**0.31**
		2008			33					1									**34**	**0.60**
		2009			57		2									1	19		**79**	**0.60**
		2010			56	1			15										**72**	**0.75**
		2011			38	1			34								1		**74**	**0.54**
Mourning Dove	*Zenaida macroura*	**2007**		5	68	797				62						7	774	1	**1714**	**44.65**
		2008			561	378				34				1		72	48	10	**1104**	**19.46**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2009			452	294	690			219	61			58		14	279	43	**2110**	**16.12**
		2010			529	279	80		42	62	3			30		34	89	21	**1169**	**12.24**
		2011	2		406	315	33		74	36	6	35	3	44	30		80	9	**1073**	**7.83**
Inca Dove	*Columbina inca*	**2008**			15														**15**	**0.26**
		2010							6					27					**33**	**0.35**
Greater Roadrunner	*Geococcyx californianus*	**2007**				10				1							3		**14**	**0.36**
		2008			4	3				1				3		1	6		**18**	**0.32**
		2009		1	3	9											1	1	**15**	**0.11**
		2010			1		1		3	2							1		**8**	**0.08**
		2011				1				1									**2**	**0.01**
Barn Owl	*Tyto alba*	**2007**								1									**1**	**0.03**
		2008				2													**2**	**0.04**
		2011				1													**1**	**0.01**
Great Horned Owl	*Bubo virginianus*	**2008**				2													**2**	**0.04**
		2009				2													**2**	**0.02**
		2010			1				3					5					**9**	**0.09**
		2011														1	1		**2**	**0.01**
Burrowing Owl	*Athene cunicularia*	**2007**				12				4						6	1		**23**	**0.60**
		2008				31				2						2	9		**44**	**0.78**
		2009				6	2			3	3					5	2		**21**	**0.16**
		2010				5				4						7			**16**	**0.17**
		2011				2				5						1	2		**10**	**0.07**
Long-eared Owl	*Asio otus*	**2007**				1													**1**	**0.03**
		2010					1												**1**	**0.01**
Short-eared Owl	*Asio flammeus*	**2007**				5				2							6		**13**	**0.34**
		2008				5				2							6	1	**14**	**0.25**
		2009				2				6							5		**13**	**0.10**
		2010				1	1			15							1		**18**	**0.19**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2011				2				3			1				1		**7**	**0.05**
White-throated Swift	*Aeronautes saxatalis*	**2010**							1										**1**	**0.01**
Acorn Woodpecker	*Melanerpes formicivorus*	**2007**			1	1													**2**	**0.05**
		2008			1														**1**	**0.02**
		2009			1									2					**3**	**0.02**
		2010			4														**4**	**0.04**
		2011			2	2								3					**7**	**0.05**
Gila Woodpecker	*Melanerpes uropygialis*	**2008**												3					**3**	**0.05**
		2009												2					**2**	**0.02**
		2011													1				**1**	**0.01**
Golden-fronted Woodpecker	*Melanerpes aurifrons*	**2008**			2														**2**	**0.04**
		2010							1							1			**2**	**0.02**
		2011							1							3			**4**	**0.03**
Williamson's Sapsucker	*Sphyrapicus thyroideus*	**2009**			2														**2**	**0.02**
Yellow-bellied Sapsucker	*Sphyrapicus varius*	**2007**			1														**1**	**0.03**
		2010			2														**2**	**0.02**
Ladder-backed Woodpecker	*Picoides scalaris*	**2007**		1		10											1		**12**	**0.31**
		2008			7	7								4			3		**21**	**0.37**
		2009		1	7	14								2		6	2	5	**37**	**0.28**
		2010			11	24	3		9	2	1			5		2	4	4	**65**	**0.68**
		2011			9	23			15	1	1	5		7	9	2	5	1	**78**	**0.57**
Arizona Woodpecker	*Picoides arizonae*	**2010**												1					**1**	**0.01**
Northern Flicker	*Colaptes auratus*	**2007**				17													**17**	**0.44**
		2008			3	25				2				8		3	1		**42**	**0.74**
		2009			2	4								5		4		2	**17**	**0.13**
		2010			5	13	3		1		4			7		3	2	9	**47**	**0.49**
		2011			8	1			10			1		1	3	4	1	11	**40**	**0.29**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2007				13													**13**	**0.34**
		2008			3	19				1				7		3	1		**34**	**0.60**
	Picoides sp.	**2009**			2	4								5		4		2	**17**	**0.13**
		2010			4	14	4		1		3			6		2	1	7	**42**	**0.44**
		2011					1												**1**	**0.01**
		2009			12														**12**	**0.09**
Gray Flycatcher	*Empidonax wrightii*	**2010**			15				20							1			**36**	**0.38**
		2011			40				27										**67**	**0.49**
Dusky Flycatcher	*Empidonax oberholseri*	**2010**							1										**1**	**0.01**
		2011							1										**1**	**0.01**
Cordilleran Flycatcher	*Empidonax occidentalis*	**2010**							1										**1**	**0.01**
		2007			3														**3**	**0.08**
	Empidonax sp.	**2008**			2														**2**	**0.04**
		2009														1			**1**	**0.01**
		2010			1														**1**	**0.01**
		2008			3									2					**5**	**0.09**
Black Phoebe	*Sayornis nigricans*	**2009**												5					**5**	**0.04**
		2010							2										**2**	**0.02**
		2011			2												1		**3**	**0.02**
		2007																1	**1**	**0.03**
		2008			3														**3**	**0.05**
Eastern Phoebe	*Sayornis phoebe*	**2009**															2		**2**	**0.02**
		2010																2	**2**	**0.02**
		2011			1														**1**	**0.01**
		2007		2	3	8				20						3	19	2	**57**	**1.48**
Say's Phoebe	*Sayornis saya*	**2008**		2	59	8				28				6		17	17	4	**141**	**2.49**
		2009		1	68	4	81			109	8			10		25	12	4	**322**	**2.46**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2010		2	64	10	35		23	83	3			6		25	17	4	**272**	**2.85**
		2011			62	18	34		21	38	1	3		10	8	18	31	6	**250**	**1.82**
Vermilion Flycatcher	*Pyrocephalus rubinus*	**2007**				1													**1**	**0.03**
		2008		1	11														**12**	**0.21**
		2009			9	1								3		1	1		**15**	**0.11**
		2010			8				9										**17**	**0.18**
		2011							1							1			**2**	**0.01**
Ash-throated Flycatcher	*Myiarchus cinerascens*	**2010**							1										**1**	**0.01**
Cassin's Kingbird	*Tyrannus vociferans*	**2007**			1														**1**	**0.03**
		2008			2														**2**	**0.04**
		2009			1												1		**2**	**0.02**
		2010							3										**3**	**0.03**
Western Kingbird	*Tyrannus verticalis*	**2007**															1		**1**	**0.03**
	Tyrannus sp.	**2008**														1			**1**	**0.02**
		2009														1			**1**	**0.01**
Loggerhead Shrike	*Lanius ludovicianus*	**2007**		3	8	32				10						3	16		**72**	**1.88**
		2008		7	78	51				63				2		14	23	12	**250**	**4.41**
		2009		9	74	46	47			48	20			12		24	49	37	**366**	**2.80**
		2010		6	58	25	48		34	71	14			6		25	55	16	**358**	**3.75**
		2011	4		65	33	25	5	32	52	11	28		9	14	15	66	10	**369**	**2.69**
Hutton's Vireo	*Vireo huttoni*	**2010**			1														**1**	**0.01**
Western Scrub-Jay	*Aphelocoma californica*	**2011**									1								**1**	**0.01**
Mexican Jay	*Aphelocoma ultramarina*	**2007**			1	13													**14**	**0.36**
		2008			10	7													**17**	**0.30**
		2009			6														**6**	**0.05**
		2010			16									7					**23**	**0.24**
		2011			12									10	12		1		**35**	**0.26**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2007		5	9	38										6	27	1	**86**	**2.24**
		2008		6	55	19				8				3		11	7	15	**124**	**2.19**
Chihuahuan Raven	*Corvus cryptoleucus*	**2009**		37	36	73	25			10	48					18	34	4	**285**	**2.18**
		2010		3	18	39	17		1	10	12					2	18	2	**122**	**1.28**
		2011	1		34	28	47		9			58		45	13	3	14	1	**253**	**1.85**
		2007			2	18				2						1	5		**28**	**0.73**
		2008			16	59				5				29		1	10		**120**	**2.12**
Common Raven	*Corvus corax*	**2009**		2		46	9			5	6			30		8	13		**119**	**0.91**
		2010		14	4	16	2		2	17	6			57		17	3	13	**151**	**1.58**
		2011	2			20	9	1	1	2	1	43	6	28	8	12	15	1	**149**	**1.09**
		2007				9													**9**	**0.23**
	Corvus sp.	**2008**		1		36				1				2		6			**46**	**0.81**
		2009		1		14	1			2				3		5		2	**28**	**0.21**
		2010				7				1									**8**	**0.08**
		2007		7		199										138	126		**470**	**12.24**
		2008		127	146	1068				99				35		922	1194	41	**3632**	**64.02**
Horned Lark	*Eremophila alpestris*	**2009**		91	6	485	165			35	108			131		2187	398	24	**3630**	**27.74**
		2010		107	242	694	615			668	139			317		1717	2120	103	**6722**	**70.40**
		2011	115		35	417	156	5	16	25	314	1568	176	248	92	732	1066	15	**4980**	**36.35**
		2007				1													**1**	**0.03**
		2008			31					1									**32**	**0.56**
Tree Swallow	*Tachycineta bicolor*	**2009**			16	6				14				5			92		**133**	**1.02**
		2010			15	16			2		1						6		**40**	**0.42**
		2011			1	30			3	7							38		**79**	**0.58**
Violet-green Swallow	*Tachycineta thalassina*	**2009**															2		**2**	**0.02**
		2007			4	2													**6**	**0.16**
Bridled Titmouse	*Baeolophus wollweberi*	**2008**			7														**7**	**0.12**
		2009			4	14													**18**	**0.14**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2011				1								4					**5**	**0.04**
Black-crested Titmouse	*Baeolophus atricristatus*	**2010**									5								**5**	**0.05**
		2011									1								**1**	**0.01**
Verdin	*Auriparus flaviceps*	**2007**			3	3													**6**	**0.16**
		2008			2					5						1			**8**	**0.14**
		2009				1	1												**2**	**0.02**
		2010			5	8			2	6	2							1	**24**	**0.25**
		2011			9		3		6		6	3		2	2				**31**	**0.23**
Bushtit	*Psaltriparus minimus*	**2007**			5	5													**10**	**0.26**
		2008			10														**10**	**0.18**
		2009			6	2								6		19			**33**	**0.25**
		2010			30				1										**31**	**0.32**
		2011			29				4	1									**34**	**0.25**
White-breasted Nuthatch	*Sitta carolinensis*	**2011**												1					**1**	**0.01**
Brown Creeper	*Certhia americana*	**2011**													1				**1**	**0.01**
Cactus Wren	*Campylorhynchus brunneicapillus*	**2007**		1	15	45				1						4	4		**70**	**1.82**
		2008		3	77	55				18				3		3	5	5	**169**	**2.98**
		2009		1	66	80	10			4	12			2		13	12	9	**209**	**1.60**
		2010		6	71	58	14		35	5	19			1		17	16	6	**248**	**2.60**
		2011			52	49	7		42	2	14	12		2	15	18	29	5	**247**	**1.80**
Rock Wren	*Salpinctes obsoletus*	**2007**			1	4													**5**	**0.13**
		2008			5	1										1			**7**	**0.12**
		2009			4	3	1												**8**	**0.06**
		2010			1	6	2							1		7			**17**	**0.18**
		2011			4	6	1		6			2		1	1		4		**25**	**0.18**
Canyon Wren	*Catherpes mexicanus*	**2007**			2	2													**4**	**0.10**
		2008			5														**5**	**0.09**
		2009			2														**2**	**0.02**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2010			1		1											1	**3**	**0.03**
		2007				11												2	**13**	**0.34**
		2008				5								1					**6**	**0.11**
Bewick's Wren	*Thryomanes bewickii*	**2009**				6												7	**13**	**0.10**
		2010			6	6	2		7							1	1		**23**	**0.24**
		2011			11	1			17	1				1	1		1	1	**34**	**0.25**
		2007			1														**1**	**0.03**
House Wren	*Troglodytes aedon*	**2010**							2										**2**	**0.02**
		2011							5						1				**6**	**0.04**
Marsh Wren	*Cistothorus palustris*	**2009**		1															**1**	**0.01**
		2010		1															**1**	**0.01**
Unidentified Wren		**2008**				1													**1**	**0.02**
		2007			14	2													**16**	**0.42**
		2008			7	2													**9**	**0.16**
Ruby-crowned Kinglet	*Regulus calendula*	**2009**			2	1								3					**6**	**0.05**
		2010			13	1				2									**16**	**0.17**
		2011			6	1			1	1	1			4			1		**15**	**0.11**
		2007			3												1		**4**	**0.10**
		2008								1									**1**	**0.02**
Blue-gray Gnatcatcher	*Polioptila caerulea*	**2009**			6		3			1						1		2	**13**	**0.10**
		2010		1	10				1		1						3	1	**17**	**0.18**
		2011			2		2		3								2		**9**	**0.07**
		2007			1	2				3									**6**	**0.16**
		2008			1	1				37							4		**43**	**0.76**
Black-tailed Gnatcatcher	*Polioptila melanura*	**2009**					8			12	2						3		**25**	**0.19**
		2010			3	2	2			13	1					1	3		**25**	**0.26**
		2011			15	1	2		3	9	5						11		**46**	**0.34**
Eastern Bluebird	*Sialia sialis*	**2007**			2														**2**	**0.05**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2009				2													**2**	**0.02**
		2010				4	17							9					**30**	**0.31**
		2011														12			**12**	**0.09**
		2007			2														**2**	**0.05**
		2008			9	7										27			**43**	**0.76**
Western Bluebird	*Sialia mexicana*	**2009**			12											11			**23**	**0.18**
		2010			2	6								4		11			**23**	**0.24**
		2011				3										51	6		**60**	**0.44**
		2007		19	21	21				125						1	8	14	**209**	**5.44**
Mountain Bluebird	*Sialia currucoides*	**2009**			42	3	1			10	2					34		6	**98**	**0.75**
		2010			149	43			3	31	1					80			**307**	**3.22**
	Sialis sp.	**2007**				3													**3**	**0.08**
		2010														20			**20**	**0.21**
		2007			1														**1**	**0.03**
		2008			1	1													**2**	**0.04**
American Robin	*Turdus migratorius*	**2010**				2								1					**3**	**0.03**
		2011												2					**2**	**0.01**
		2007		3	3					5						1		1	**13**	**0.34**
		2008		9	22					2						9		1	**43**	**0.76**
Northern Mockingbird	*Mimus polyglottos*	**2009**		5	16		7			14				1		3		3	**49**	**0.37**
		2010		6	3				6	6						3	1		**25**	**0.26**
		2011	1		3	5			14	7	1				1	2		1	**35**	**0.26**
		2007		1		1				4									**6**	**0.16**
		2009				1	3			7	2							1	**14**	**0.11**
Sage Thrasher	*Oreoscoptes montanus*	**2010**			1	8				2							1		**12**	**0.13**
		2011				1					1	2					2		**6**	**0.04**
		2007			8	35				2						3	1		**49**	**1.28**
Curve-billed Thrasher	*Toxostoma curvirostre*	**2008**		1	30	20				21				6		8	5	4	**95**	**1.67**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2009		3	35	47	4			13	6			1		16	3	9	**137**	**1.05**
		2010			38	26	13		32	15	8			1		23	6	3	**165**	**1.73**
		2011	3		30	12	4		27	6	6	2	2		6	12	3	1	**114**	**0.83**
		2007				1											1		**2**	**0.05**
		2008				2													**2**	**0.04**
Crissal Thrasher	*Toxostoma crissale*	**2009**				2								1					**3**	**0.02**
		2010				5													**5**	**0.05**
		2011				11					9			1	7				**28**	**0.20**
	Toxostoma sp.	**2010**				1													**1**	**0.01**
		2007				1													**1**	**0.03**
European Starling	*Sturnus vulgaris*	**2008**				6													**6**	**0.11**
		2009				3													**3**	**0.02**
		2007		2						1						435			**438**	**11.41**
		2008				1										56	1		**58**	**1.02**
American Pipit	*Anthus rubescens*	**2009**		51							5					428			**484**	**3.70**
		2010		21					45							369			**435**	**4.56**
		2011							10							93			**103**	**0.75**
		2007		2		11										7	7		**27**	**0.70**
		2008		1	31	10										17	26	3	**88**	**1.55**
Sprague's Pipit	*Anthus spragueii*	**2009**			36	12	2			5	2			12		28	3	18	**118**	**0.90**
		2010		2	23	5	6		3	6	8			1		20	7	9	**90**	**0.94**
		2011			16	4	10	3	6	1	12	1				18	20	15	**106**	**0.77**
		2007								1						2			**3**	**0.08**
	Anthus sp.	**2008**															2		**2**	**0.04**
		2009			1														**1**	**0.01**
		2010		1															**1**	**0.01**
Cedar Waxwing	*Bombycilla cedrorum*	**2008**								1									**1**	**0.02**
Phainopepla	*Phainopepla nitens*	**2007**		56	3												3		**62**	**1.62**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpaís	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2008			1	6				2									**9**	**0.16**
		2009			5	2													**7**	**0.05**
		2010			3	5													**8**	**0.08**
		2011			10	2			1						1				**14**	**0.10**
Orange-crowned Warbler	*Vermivora celata*	**2008**			1														**1**	**0.02**
		2009		1	1														**2**	**0.02**
		2011															3		**3**	**0.02**
Yellow-rumped Warbler	*Dendroica coronata*	**2007**		14															**14**	**0.36**
		2008		12	5														**17**	**0.30**
		2009		6	2														**8**	**0.06**
		2010		16	1	1													**18**	**0.19**
		2011				1			2					12					**15**	**0.11**
Black-throated Gray Warbler	*Dendroica nigrescens*	**2010**			1				1										**2**	**0.02**
		2011							1										**1**	**0.01**
Townsend's Warbler	*Dendroica townsendi*	**2010**							3										**3**	**0.03**
Hepatic Tanager	*Piranga flava*	**2010**							3										**3**	**0.03**
Summer Tanager	*Piranga rubra*	**2010**			3														**3**	**0.03**
		2011			6				8										**14**	**0.10**
Green-tailed Towhee	*Pipilo chlorurus*	**2007**			4	23													**27**	**0.70**
		2008			1	6				8							1		**16**	**0.28**
		2009			4	10	3			4	1						9		**31**	**0.24**
		2010			16	1	1		6	5	1						1		**31**	**0.32**
		2011			8	19			10	1	4	6			17		3	3	**71**	**0.52**
Spotted Towhee	*Pipilo maculatus*	**2007**				3													**3**	**0.08**
		2008				1				2									**3**	**0.05**
		2010			1													2	**3**	**0.03**
		2011			1														**1**	**0.01**
Canyon Towhee	*Pipilo fuscus*	**2007**			12	8										4		1	**25**	**0.65**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2008			75	8								5		4	12		**104**	**1.83**
		2009			49	13	28			2	12			4		12	4		**124**	**0.95**
		2010			43	32	20		56		5					6	5	2	**169**	**1.77**
		2011			67	4	20		85		9	18		3	12	18	13	2	**251**	**1.83**
		2007			4	8											5		**17**	**0.44**
		2008			2	5										1	1		**9**	**0.16**
Cassin's Sparrow	*Aimophila cassinii*	**2009**			7	3	1			2	25			1			2	20	**61**	**0.47**
		2010			20	2			4	2	1			1			11	3	**44**	**0.46**
		2011			14	7	37				9	5		3	2	1	15		**93**	**0.68**
		2007			8														**8**	**0.21**
		2008														1			**1**	**0.02**
Botteri's Sparrow	*Aimophila botterii*	**2009**			1														**1**	**0.01**
		2010			1				1										**2**	**0.02**
		2011							1										**1**	**0.01**
		2007			4	1												1	**6**	**0.16**
		2008			15	1				4								1	**21**	**0.37**
Rufous-crowned Sparrow	*Aimophila ruficeps*	**2009**			7	13								1				22	**43**	**0.33**
		2010			5	10	9		5										**29**	**0.30**
		2011			4	2	4		3			1		1	1		2		**18**	**0.13**
		2008			1												1	3	**5**	**0.09**
	Aimophila sp.	**2009**														1		1	**2**	**0.02**
		2010								1								2	**3**	**0.03**
		2011				1				3			18	1	1	3		3	**30**	**0.22**
		2007			157	192				17							43		**409**	**10.65**
		2008			1392	22				29				75		59	51		**1628**	**28.70**
Chipping Sparrow	*Spizella passerina*	**2009**			1861	193	386			12	224			32		35	59	67	**2869**	**21.92**
		2010			3203	12	162		524	47	9			101		65	99	1	**4223**	**44.23**
		2011			1512	178	200		415	10	85	103	72	157	185	4	519	30	**3470**	**25.33**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Clay-colored Sparrow	*Spizella pallida*	**2007**			237	127				259						7	55	1	**686**	**17.87**
		2008			212	26				178							34		**450**	**7.93**
		2009			148		1300			230	156						125	3	**1962**	**14.99**
		2010			99		219		186	205	76						24		**809**	**8.47**
		2011	1		51	32	31		84	4	5	4		2	1		113	11	**339**	**2.47**
Brewer's Sparrow	*Spizella breweri*	**2007**			40	184				34						1	130		**389**	**10.13**
		2008			1124	237				636				16			98		**2111**	**37.21**
		2009			692	320	49			1319	54			3			322	31	**2790**	**21.32**
		2010		18	1336	27	230		513	1394	42			1		10	728	4	**4303**	**45.07**
		2011	37		1022	1377	726	52	92	291	110	1872	68	140	541		1978	21	**8327**	**60.79**
Field Sparrow	*Spizella pusilla*	**2010**																1	**1**	**0.01**
Worthen's Sparrow	*Spizella wortheni*	**2008**														7			**7**	**0.12**
		2009														5			**5**	**0.04**
		2010														30			**30**	**0.31**
		2011														137			**137**	**1.00**
Black-chinned Sparrow	*Spizella atrogularis*	**2007**			6														**6**	**0.16**
		2010							3										**3**	**0.03**
		2011							4										**4**	**0.03**
	Spizella sp.	**2007**			1	43				1							1		**46**	**1.20**
		2008			12	12				47				3					**74**	**1.30**
		2009			11	11	13			22	7						3	1	**68**	**0.52**
		2010			1		17		3	10	2					1		3	**37**	**0.39**
		2011	11		4	175	32		9	34	13	45	6	6	39	1	62	3	**440**	**3.21**
Vesper Sparrow	*Pooecetes gramineus*	**2007**		1	28	780				107						7	776	31	**1730**	**45.07**
		2008			908	252				217				246		15	297	148	**2083**	**36.72**
		2009			1607	442	947			916	253			142		8	836	965	**6116**	**46.73**
		2010			1683	94	82		332	494	1			66		4	571	244	**3571**	**37.40**
		2011			1288	727	337		333	55	50	259	6	267	487	17	1032	596	**5454**	**39.81**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Lark Sparrow	*Chondestes grammacus*	**2007**			66	1				1							8		**76**	**1.98**
		2008			17					9						6			**32**	**0.56**
		2009			326	1	5			1	1								**334**	**2.55**
		2010			197		1		31										**229**	**2.40**
		2011			95	1			25										**121**	**0.88**
Black-throated Sparrow	*Amphispiza bilineata*	**2007**			70	143				53						1	30		**297**	**7.74**
		2008		1	213	53				437				22		8	32	20	**786**	**13.85**
		2009		1	119	103	151			229	157			14		9	130	14	**927**	**7.08**
		2010		12	205	178	206		21	150	64			21		9	154	69	**1089**	**11.41**
		2011	15		130	172	173	4	8	80	161	234	23	69	156	7	260	21	**1513**	**11.04**
Sage Sparrow	*Amphispiza belli*	**2008**			10												2		**12**	**0.21**
		2009									27						3		**30**	**0.23**
		2010								13	9						26	10	**58**	**0.61**
		2011	3			4	7				8	39			6		6		**73**	**0.53**
Unidentified Sparrow		**2007**			22	206										1	17		**246**	**6.41**
		2008			43	51				19				7			1		**121**	**2.13**
		2009			33	147	2			47				19			5	3	**256**	**1.96**
		2010				9	2				5							1	**17**	**0.18**
		2011	22			71	6			12	3	380	22	71	64	1	21	9	**682**	**4.98**
Lark Bunting	*Calamospiza melanocorys*	**2007**				2556				230							127		**2913**	**75.88**
		2008		64	245	242				827				53			118	35	**1584**	**27.92**
		2009			3	248	1022			6035	120					271	33	53	**7785**	**59.49**
		2010			329	92	39		48	2279	107					1328	440	6	**4668**	**48.89**
		2011	65		611	2553	438		93	185	92	954	10	70	608	70	800	7	**6556**	**47.86**
Savannah Sparrow	*Passerculus sandwichensis*	**2007**			30	516				91						25	366	4	**1032**	**26.88**
		2008		135		46				4				27		45	32	94	**383**	**6.75**
		2009		1	417	427	48			117	213			137		22	162	1042	**2586**	**19.76**
		2010			652	42			31	58				83		4	96	813	**1779**	**18.63**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2011			298	69	59		58	15	3	120	6	173	95	18	391	402	**1707**	**12.46**
Grasshopper Sparrow	*Ammodramus savannarum*	**2007**			44	86				45							19	2	**196**	**5.11**
		2008			58	5				7				3		2	16	1	**92**	**1.62**
		2009			80	21	202			98	49			13		8	71	117	**659**	**5.04**
		2010			165	19	6		48	50	5			20			50	2	**365**	**3.82**
		2011			104	13	27		49	7	19	25	6	35	27	4	49	2	**367**	**2.68**
Baird's Sparrow	*Ammodramus bairdii*	**2007**			3	1											4	1	**9**	**0.23**
		2008			37	3				4									**44**	**0.78**
		2009			49	6	12				1			5			30	4	**107**	**0.82**
		2010			72	3	3		2	1	1			20			15	2	**119**	**1.25**
		2011			74	12	6	2	8	2	1	2	1	3			17	1	**129**	**0.94**
Savannah +	*Ammodramus sp*	**2008**			23	21				2						1	1	3	**51**	**0.90**
		2009			74	6	3			16				6		1	21	16	**143**	**1.09**
		2010			78	13	1		17	6							2	10	**127**	**1.33**
		2011			20	13			3	3	1			30	18	6	13	6	**113**	**0.82**
	Ammodramus sp.	**2007**			1	29											52	6	**88**	**2.29**
		2008			12	6								1		3	1	4	**27**	**0.48**
		2009			54	46	14			10	1			28		1	53	21	**228**	**1.74**
		2010			25	20	8		9	7	6			3		1	26	11	**116**	**1.21**
		2011	2		72	7	8	1	10	3	4	20		52	20	12	23	6	**240**	**1.75**
Song Sparrow	*Melospiza melodia*	**2007**								4									**4**	**0.10**
		2008								1				1					**2**	**0.04**
Lincoln's Sparrow	*Melospiza lincolnii*	**2007**			5	10											2		**17**	**0.44**
		2009			9	5				5							1	7	**27**	**0.21**
		2010			3				2					1					**6**	**0.06**
		2011				8			5	1				3	13				**30**	**0.22**
	Melospiza sp.	**2008**				1													**1**	**0.02**
White-throated	*Zonotrichia albicollis*	**2008**			10														**10**	**0.18**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Sparrow		**2009**				2													**2**	**0.02**
White-crowned Sparrow	*Zonotrichia leucophrys*	**2007**				42				2							18		**62**	**1.62**
		2008		1	22	83				4				11			71	20	**212**	**3.74**
		2009			2	22	2				8			5			19	77	**135**	**1.03**
		2010			9	119			36		18			54			23	2	**261**	**2.73**
		2011			9	131			4		39	40		4	132		20		**379**	**2.77**
Dark-eyed Junco	*Junco hyemalis*	**2007**			1	24													**25**	**0.65**
		2008				5													**5**	**0.09**
		2009				2													**2**	**0.02**
		2010			4	1													**5**	**0.05**
		2011										1							**1**	**0.01**
McCown's Longspur	*Calcarius mccownii*	**2007**				7											16		**23**	**0.60**
		2008				169				3									**172**	**3.03**
		2009				60					1			2					**63**	**0.48**
		2010					4												**4**	**0.04**
		2011					4				3								**7**	**0.05**
Chestnut-collared Longspur	*Calcarius ornatus*	**2007**				1403				23							1111	12	**2549**	**66.40**
		2008			1514	1661				6				19		3	517		**3720**	**65.57**
		2009			936	1262	5578			564	1707			291			4749	159	**15246**	**116.50**
		2010			2344	660	456			631	63			239			3399	419	**8211**	**86.00**
		2011	151		1144	1684	1726	39		216	688	2037	771	806	110		9665	29	**19066**	**139.18**
	Calcarius sp.	**2007**				3				7									**10**	**0.26**
		2008												1					**1**	**0.02**
		2009									1			1				1	**3**	**0.02**
		2010				1	1										1		**3**	**0.03**
Northern Cardinal	*Cardinalis cardinalis*	**2009**			2														**2**	**0.02**
		2010			1				1					1					**3**	**0.03**
		2011			1		3		2		3				1				**10**	**0.07**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Pyrrhuloxia	*Cardinalis sinuatus*	**2007**			2	3				2									**7**	**0.18**
		2008		1	14	12				1									**28**	**0.49**
		2009			4	1	13			4	7						1		**30**	**0.23**
		2010		2	35	2	2		8	4							5		**58**	**0.61**
		2011			33	10	1		20		4	1			1		4		**74**	**0.54**
Red-winged Blackbird	*Agelaius phoeniceus*	**2011**							1										**1**	**0.01**
Eastern Meadowlark	*Sturnella magna*	**2007**			9	72											21		**102**	**2.66**
		2008			204	115				1				27		2	51	8	**408**	**7.19**
		2009		17	149	184	2			95	9			89		26	79	49	**699**	**5.34**
		2010		3	318	207	47		15	146	3			83		3	144	66	**1035**	**10.84**
		2011	3		190	52	86		40	111	110	60	18	112	60	23	93	29	**987**	**7.20**
Western Meadowlark	*Sturnella neglecta*	**2007**		1	11	12				55							11	2	**92**	**2.40**
		2008			24	18				15						22			**79**	**1.39**
		2009			22	8	173			32	272			1		22	8	42	**580**	**4.43**
		2010			35	39	7		1	11	41			1		35	2	2	**174**	**1.82**
		2011			10	43					11	17		2	5		20	1	**109**	**0.80**
	Sturnella sp.	**2008**															16	26	**42**	**0.74**
		2009			40	33	2			11				12		4	23	7	**132**	**1.01**
		2010		2	10	13	5			10						21	8	18	**87**	**0.91**
		2011	4		12	44				1	11	72		25	40	10	98	13	**330**	**2.41**
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	**2009**												2					**2**	**0.02**
		2011							2					7					**9**	**0.07**
Brewer's Blackbird	*Euphagus cyanocephalus*	**2008**		272										17					**289**	**5.09**
		2009		464		13											8	24	**509**	**3.89**
		2010		1771	52				74					4		20	15	60	**1996**	**20.90**
		2011				87								86	4		81		**258**	**1.88**
Unidentified		**2008**				1													**1**	**0.02**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
Blackbird		**2009**				1													**1**	**0.01**
		2010				1													**1**	**0.01**
		2011													430				**430**	**3.14**
Great-tailed Grackle	*Quiscalus mexicanus*	**2007**														1			**1**	**0.03**
		2009				1				361				1					**363**	**2.77**
		2010		8						65				18			3		**94**	**0.98**
		2011												6			1		**7**	**0.05**
Brown-headed Cowbird	*Molothrus ater*	**2007**			62					20									**82**	**2.14**
		2008			19														**19**	**0.33**
		2009			42	1								39					**82**	**0.63**
		2010			18				20					17					**55**	**0.58**
		2011			12				74										**86**	**0.63**
Unidentified Cowbird		**2008**			1														**1**	**0.02**
House Finch	*Carpodacus mexicanus*	**2007**				45										75			**120**	**3.13**
		2008		6		3				7				1		31			**48**	**0.85**
		2009			11	7								8		2	7	4	**39**	**0.30**
		2010		1	15	6	2		1	10				42		42	30	16	**165**	**1.73**
		2011	2		25	23			18		11	25		8	7	50	106	2	**277**	**2.02**
Pine Siskin	*Carduelis pinus*	**2008**												3					**3**	**0.05**
		2011													1				**1**	**0.01**
Lesser Goldfinch	*Carduelis psaltria*	**2007**			49														**49**	**1.28**
		2008			6														**6**	**0.11**
		2009			3	1													**4**	**0.03**
		2010			1	1					1								**3**	**0.03**
		2011													1		69		**70**	**0.51**
House Sparrow	*Passer domesticus*	**2007**				6													**6**	**0.16**
		2009				3								10					**13**	**0.10**
		2010				4													**4**	**0.04**

Common Name	Scientific Name	Year	Armendaris	Cuatro Ciénegas	Cuchillas de la Zarca	Janos	Lagunas del Este	Llano Amapolas	Malpais	Mapimí	Marfa	NM Bootheel	Otero Mesa	Sonoita	Sulphur Springs	El Tokio	Valles Centrales	Valle Colombia	Total	birds/ 100km
		2011													2				**2**	**0.01**
Unidentified Bird		**2007**				4													**4**	**0.10**
		2008		1		10				38				2			2		**53**	**0.93**
		2009				17								3			1		**21**	**0.16**
		2010		5		4	2							1		1		2	**15**	**0.16**
		2011	40			194				7	3	76	17	14	26	1	21	3	**402**	**2.93**
All Birds (combined)		**2007**		129	1417	9585				1604						775	4217	85	**17812**	**463.99**
		2008		973	10554	6103				3304				739		1570	3371	476	**27090**	**477.51**
		2009		773	16596	5766	11159			10907	3732			1737		3400	8011	3062	**65143**	**497.76**
		2010		2117	13754	4175	2495		2785	6793	726			1343		4158	9321	2045	**49712**	**520.64**
		2011	490		13232	8982	4331	113	2196	2758	1940	8368	1264	2699	3398	1436	17279	1318	**69804**	**509.56**
All Birds	**Total**	**All years**	**490**	**8093**	**97284**	**58063**	**31635**	**113**	**7756**	**47454**	**10815**	**8341**	**1237**	**10151**	**3388**	**21025**	**84048**	**12529**	**402422**	**6.86**

Appendix B – Estimates of density for 29 grassland-associated bird species and 4 species groups in 16 Grassland Priority Conservation Areas from 2007–2011

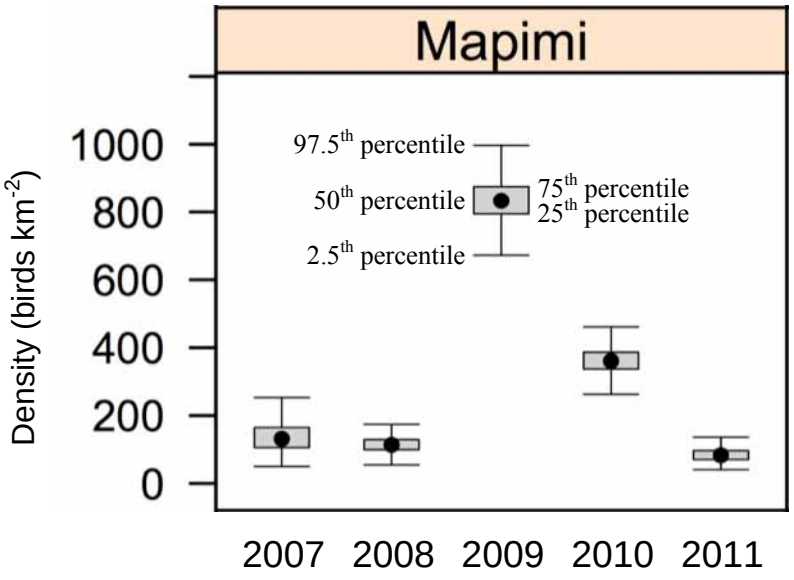
Species tables

Tables in this appendix list 5 statistics (mean, standard deviation, and the 2.5th, 25th, 50th, 75th, and 97.5th percentiles) of the posterior distribution for 29 species' density (in birds km^{-2}) for all GPCAs and years, as estimated by Bayesian hierarchical distance model.

Species panel boxplots

Panel boxplots show the percentiles of each posterior distribution of density contained in the main tables. As an example, we show the panel boxplot for Lark Bunting in GPCA Mapimí. The posterior distribution of density in 2009 is show as a box that comprises the interquantile range and whiskers show the 2.5 and 97.5th percentiles or the 95% credible interval. The median (or 50th percentile) is shown as a dot within the box.

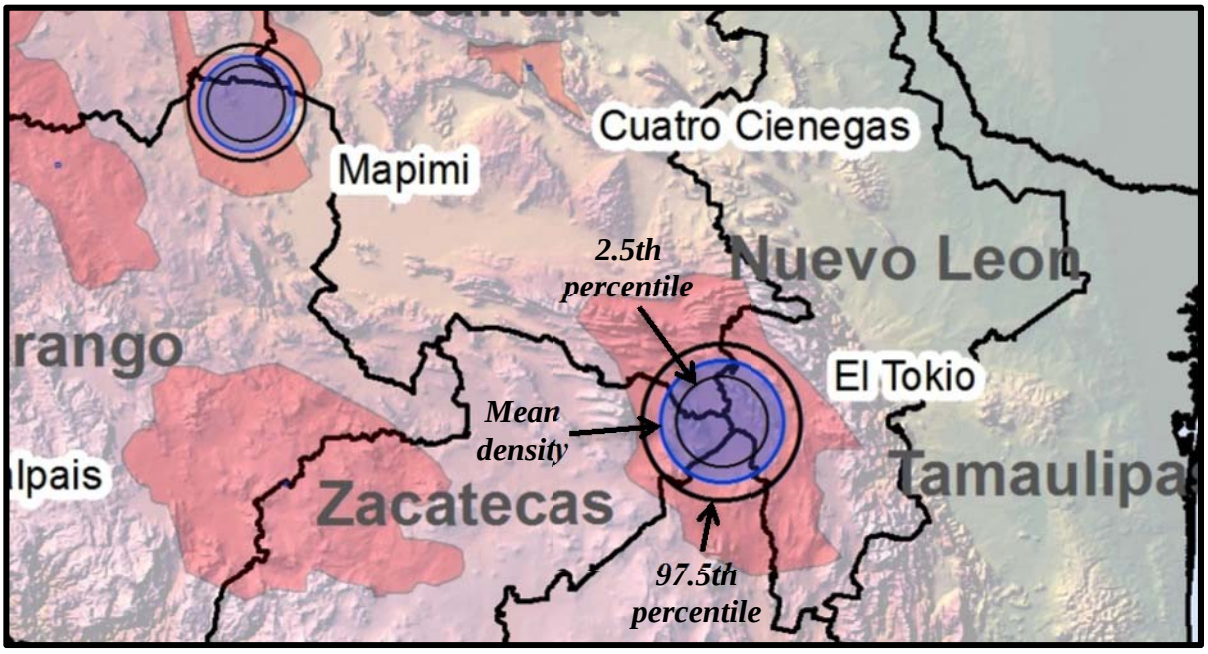
GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	137.62	114.91	835.35	362.69	84.28	306.97
	SD	42.75	22.03	60.20	37.14	18.66	18.68
	2.5%	70.80	76.42	723.20	294.70	51.85	272.24
	25.0%	105.70	99.36	794.00	337.00	70.49	294.22
	50.0%	131.60	113.70	833.20	360.70	82.95	306.44
	75.0%	164.70	129.20	875.30	386.60	96.68	319.10
	97.5%	235.00	160.50	956.20	441.00	123.90	345.06



Species maps

Species maps show posterior mean density (in birds per km^{-2}) across years in all GPCAs as filled blue circles, whose area is proportional to the value of density. Concentric black circles show the 95% credible interval, where the smallest and largest concentric circles correspond to the 2.5th and the 97.5th percentiles, respectively (see gray shading in the corresponding table). As an example, we show the species map for the Burrowing Owl in El Tokio GPCA. This graph shows the relative importance of each GPCA for wintering bird conservation and also shows the precision associated to bird density estimates.

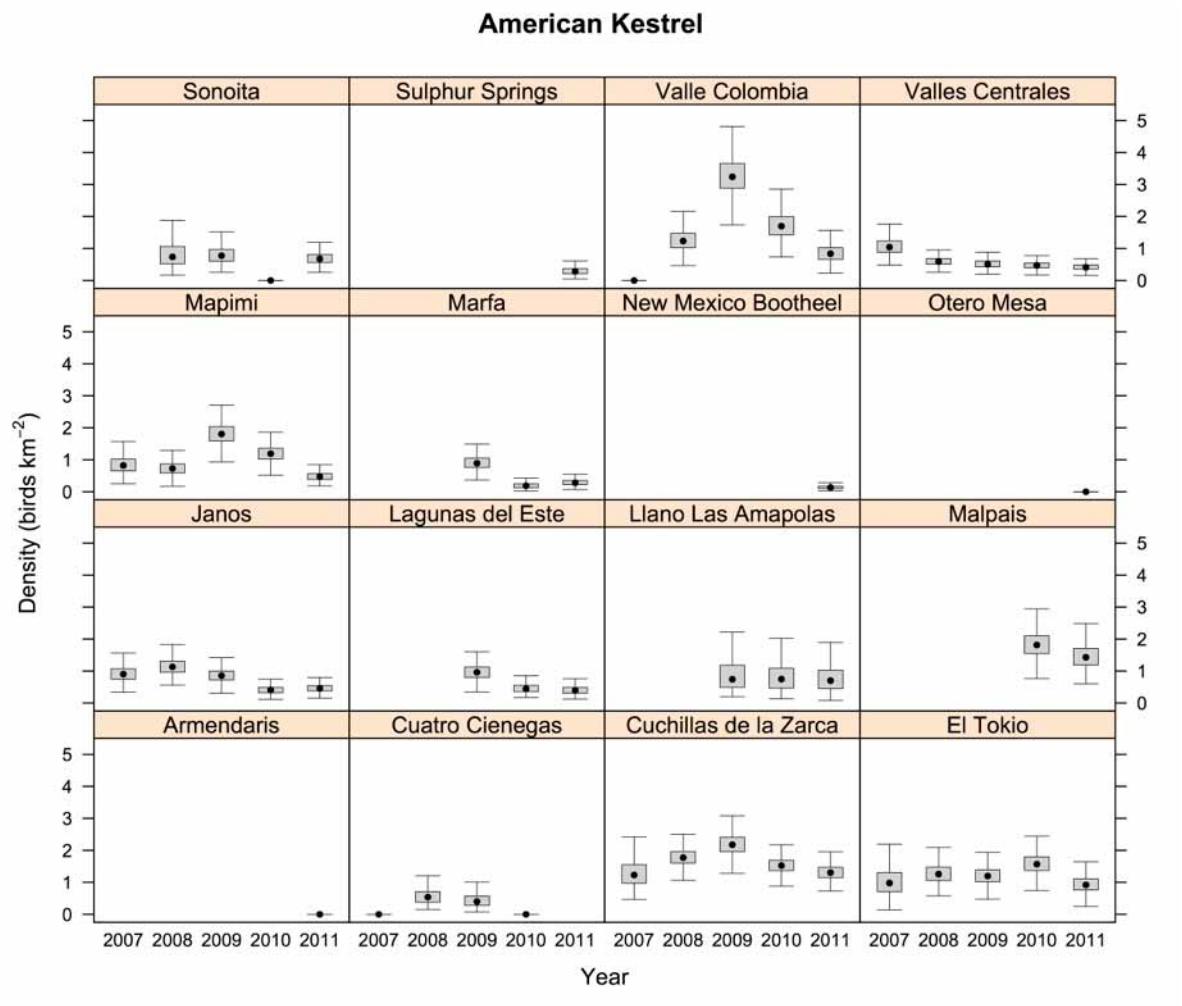
GPCA	Parameter	2007	2008	2009	2010	2011	Average
El Tokio	Mean	3.71	0.70	0.97	1.57	0.64	1.52
	SD	1.88	0.35	0.39	0.51	0.27	0.44
	2.5%	0.96	0.21	0.41	0.81	0.27	0.81
	25.0%	2.31	0.45	0.68	1.18	0.44	1.19
	50.0%	3.44	0.66	0.88	1.50	0.59	1.47
	75.0%	4.85	0.88	1.17	1.89	0.78	1.79
	97.5%	8.00	1.54	1.98	2.72	1.36	2.50

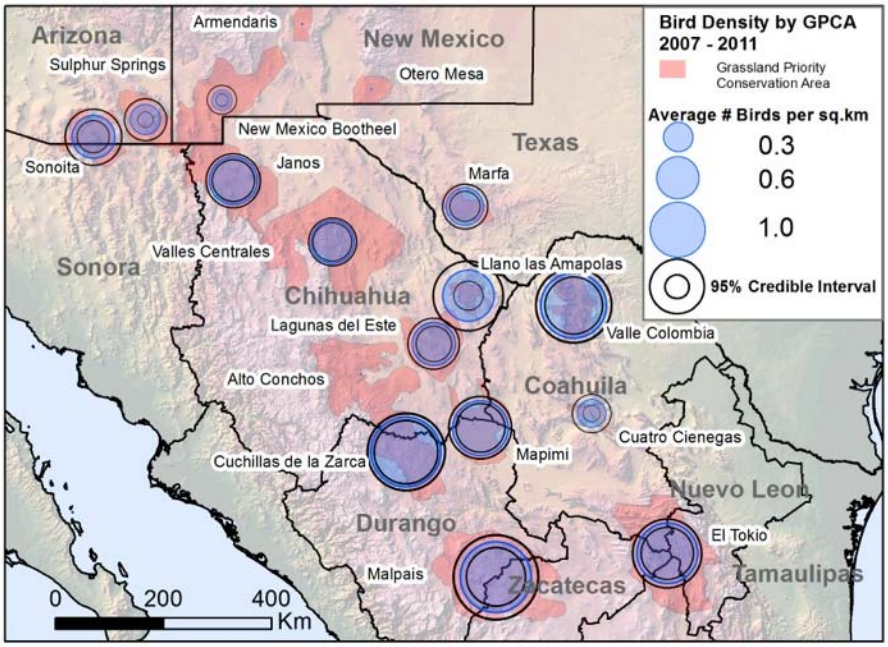


American Kestrel (*n* = 586)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.57	0.46	0.00		0.26
	SD	0.00	0.25	0.25	0.00		0.10
	2.5%	0.00	0.22	0.13	0.00		0.10
	25.0%	0.00	0.38	0.28	0.00		0.17
	50.0%	0.00	0.54	0.40	0.00		0.25
	75.0%	0.00	0.71	0.57	0.00		0.32
	97.5%	0.00	1.14	1.07	0.00		0.48
Cuchillas de la Zarca	Mean	1.29	1.79	2.19	1.54	1.32	1.63
	SD	0.43	0.27	0.33	0.25	0.24	0.16
	2.5%	0.61	1.30	1.58	1.10	0.93	1.35
	25.0%	0.97	1.60	1.96	1.37	1.15	1.52
	50.0%	1.23	1.77	2.17	1.52	1.30	1.62
	75.0%	1.55	1.96	2.41	1.69	1.47	1.73
	97.5%	2.26	2.34	2.90	2.08	1.85	1.95
El Tokio	Mean	1.04	1.28	1.22	1.59	0.94	1.22
	SD	0.43	0.30	0.28	0.32	0.25	0.17
	2.5%	0.38	0.78	0.72	1.02	0.53	0.89
	25.0%	0.71	1.06	1.02	1.37	0.76	1.10
	50.0%	0.98	1.26	1.20	1.57	0.92	1.21
	75.0%	1.31	1.47	1.39	1.80	1.11	1.32
	97.5%	2.01	1.92	1.82	2.27	1.49	1.58
Janos	Mean	0.92	1.15	0.87	0.42	0.47	0.77
	SD	0.23	0.25	0.21	0.14	0.13	0.10
	2.5%	0.50	0.73	0.46	0.21	0.25	0.58
	25.0%	0.74	0.96	0.72	0.32	0.38	0.69
	50.0%	0.90	1.13	0.86	0.41	0.46	0.76
	75.0%	1.07	1.31	1.00	0.49	0.55	0.83
	97.5%	1.40	1.68	1.31	0.77	0.77	0.97
Lagunas del Este	Mean			0.98	0.47	0.41	0.62
	SD			0.23	0.15	0.13	0.12
	2.5%			0.58	0.25	0.19	0.41
	25.0%			0.80	0.36	0.31	0.53
	50.0%			0.96	0.45	0.40	0.61
	75.0%			1.12	0.55	0.49	0.70
	97.5%			1.48	0.85	0.70	0.87
Llano Las Amapolas	Mean			0.92	0.86	0.77	0.85
	SD			0.59	0.51	0.43	0.35
	2.5%			0.28	0.21	0.14	0.29
	25.0%			0.49	0.47	0.45	0.58
	50.0%			0.74	0.75	0.70	0.80
	75.0%			1.18	1.09	1.03	1.07
	97.5%			2.45	2.15	1.80	1.64
Malpaís	Mean				1.85	1.47	1.66
	SD				0.44	0.38	0.32
	2.5%				1.10	0.83	1.14
	25.0%				1.55	1.19	1.44
	50.0%				1.81	1.43	1.63
	75.0%				2.11	1.71	1.85
	97.5%				2.87	2.33	2.38

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.87	0.73	1.83	1.20	0.49	1.02
	SD	0.31	0.21	0.35	0.25	0.14	0.13
	2.5%	0.45	0.35	1.22	0.73	0.26	0.80
	25.0%	0.65	0.59	1.59	1.02	0.38	0.93
	50.0%	0.82	0.73	1.80	1.19	0.47	1.02
	75.0%	1.02	0.87	2.04	1.36	0.57	1.11
	97.5%	1.60	1.17	2.60	1.74	0.84	1.29
Marfa	Mean			0.92	0.19	0.30	0.47
	SD			0.23	0.09	0.10	0.10
	2.5%			0.56	0.06	0.13	0.31
	25.0%			0.76	0.13	0.22	0.40
	50.0%			0.89	0.19	0.28	0.46
	75.0%			1.05	0.25	0.35	0.53
	97.5%			1.45	0.39	0.52	0.68
New Mexico Bootheel	Mean					0.14	0.14
	SD					0.06	0.06
	2.5%					0.05	0.05
	25.0%					0.10	0.10
	50.0%					0.13	0.13
	75.0%					0.18	0.18
	97.5%					0.28	0.28
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.90	0.81	0.00	0.70	0.60
	SD		0.58	0.28	0.00	0.19	0.18
	2.5%		0.26	0.39	0.00	0.38	0.34
	25.0%		0.52	0.61	0.00	0.56	0.47
	50.0%		0.74	0.78	0.00	0.68	0.57
	75.0%		1.06	0.97	0.00	0.81	0.69
	97.5%		2.53	1.49	0.00	1.12	1.05
Sulphur Springs	Mean					0.30	0.30
	SD					0.13	0.13
	2.5%					0.08	0.08
	25.0%					0.21	0.21
	50.0%					0.28	0.28
	75.0%					0.37	0.37
	97.5%					0.59	0.59
Valle Colombia	Mean	0	1.27	3.29	1.73	0.86	1.43
	SD	0	0.33	0.61	0.43	0.28	0.19
	2.5%	0	0.73	2.20	1.01	0.40	1.08
	25.0%	0	1.02	2.89	1.43	0.66	1.30
	50.0%	0	1.24	3.24	1.70	0.84	1.42
	75.0%	0	1.48	3.66	2.00	1.02	1.55
	97.5%	0	2.01	4.59	2.65	1.49	1.86
Valles Centrales	Mean	1.07	0.60	0.53	0.48	0.42	0.62
	SD	0.25	0.13	0.14	0.12	0.10	0.08
	2.5%	0.64	0.38	0.29	0.27	0.24	0.49
	25.0%	0.88	0.51	0.43	0.40	0.35	0.56
	50.0%	1.04	0.59	0.51	0.47	0.41	0.61
	75.0%	1.24	0.69	0.61	0.55	0.48	0.67
	97.5%	1.58	0.92	0.85	0.75	0.62	0.78

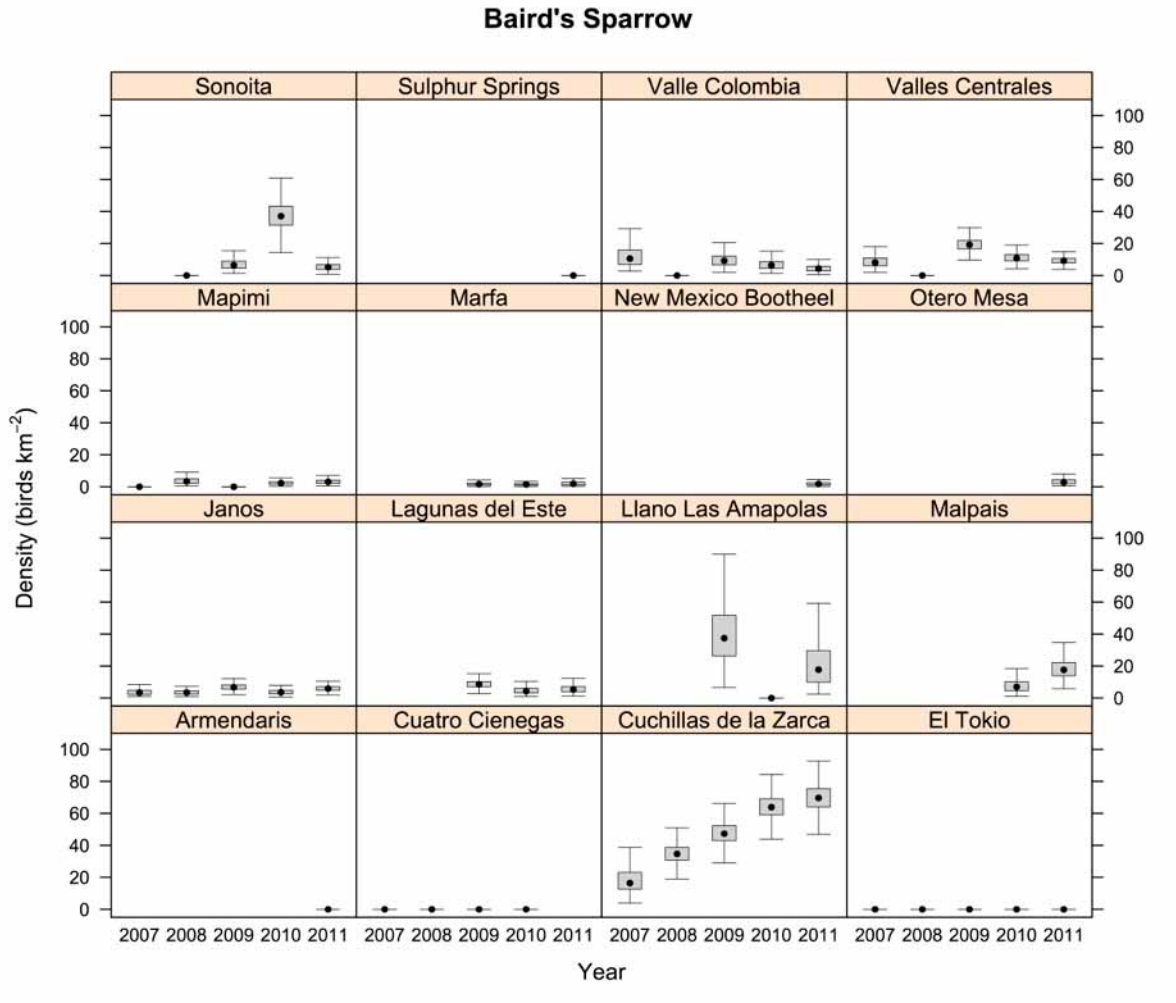

American Kestrel
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0 1 2 3 4 5
2007 2008 2009 2010 2011
Year

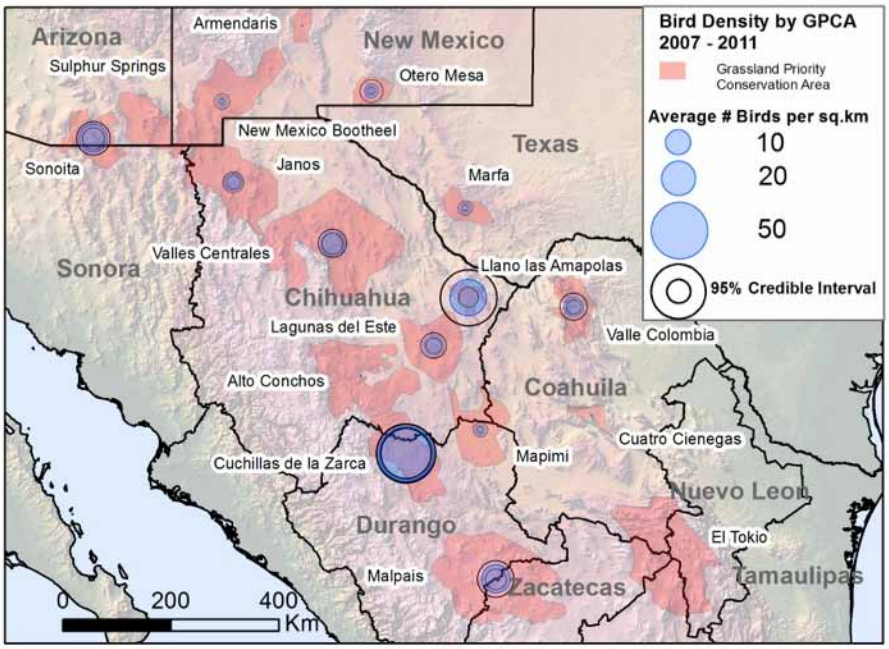

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0 200 400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.3
0.6
1.0
95% Credible Interval

Baird's Sparrow (*n* = 384)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	18.41	34.84	47.80	64.25	69.92	47.04
	SD	8.01	5.84	7.08	7.48	8.55	3.75
	2.5%	6.37	23.88	34.83	50.56	54.15	40.20
	25.0%	12.67	30.74	42.94	59.02	63.99	44.40
	50.0%	16.43	34.65	47.30	63.87	69.66	46.89
	75.0%	23.12	38.81	52.24	69.12	75.44	49.51
	97.5%%	37.53	46.53	62.68	79.85	87.80	54.74
El Tokio	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%%	0.00	0.00	0.00	0.00	0.00	0.00
Janos	Mean	3.88	3.63	6.97	3.87	6.16	4.90
	SD	2.03	1.50	2.24	1.72	1.87	1.06
	2.5%	1.35	1.37	3.12	1.24	3.05	3.01
	25.0%	2.38	2.51	5.54	2.64	4.86	4.13
	50.0%	3.42	3.46	6.71	3.62	5.92	4.85
	75.0%	4.81	4.46	8.20	4.77	7.12	5.58
	97.5%%	9.60	7.23	12.20	8.17	10.71	7.16
Lagunas del Este	Mean			8.86	4.88	5.83	6.52
	SD			2.61	2.29	2.74	1.64
	2.5%			4.30	1.83	1.99	3.91
	25.0%			7.03	3.20	3.79	5.26
	50.0%			8.61	4.29	5.32	6.42
	75.0%			10.29	6.10	7.21	7.51
	97.5%%			14.88	10.43	12.66	10.23
Llano Las Amapolas	Mean			41.66	0.00	22.27	21.31
	SD			21.81	0.00	17.41	10.95
	2.5%			11.78	0.00	4.25	6.47
	25.0%			26.34	0.00	9.92	13.83
	50.0%			37.44	0.00	17.80	18.86
	75.0%			51.76	0.00	29.67	26.11
	97.5%%			96.64	0.00	61.56	51.34
Malpaís	Mean				7.80	18.45	13.12
	SD				4.25	6.14	3.94
	2.5%				2.01	8.62	6.72
	25.0%				4.63	13.90	10.27
	50.0%				7.01	17.64	12.63
	75.0%				10.15	22.21	15.49
	97.5%%				17.78	32.72	22.14

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	3.72	0.00	2.50	3.31	1.91
	SD	0.00	2.15	0.00	1.30	1.54	0.69
	2.5%	0.00	0.77	0.00	0.58	1.07	0.69
	25.0%	0.00	2.12	0.00	1.58	2.17	1.43
	50.0%	0.00	3.31	0.00	2.31	3.05	1.87
	75.0%	0.00	4.91	0.00	3.14	4.13	2.31
	97.5%%	0.00	8.94	0.00	5.77	7.14	3.48
Marfa	Mean			1.90	1.58	2.10	1.86
	SD			1.21	0.86	1.19	0.69
	2.5%			0.48	0.39	0.50	0.73
	25.0%			1.06	0.97	1.22	1.38
	50.0%			1.60	1.46	1.90	1.83
	75.0%			2.34	1.97	2.80	2.26
	97.5%%			5.43	3.87	4.72	3.29
New Mexico Bootheel	Mean					1.94	1.94
	SD					1.04	1.04
	2.5%					0.42	0.42
	25.0%					1.22	1.22
	50.0%					1.81	1.81
	75.0%					2.52	2.52
	97.5%%					4.18	4.18
Otero Mesa	Mean					3.32	3.32
	SD					2.00	2.00
	2.5%					0.79	0.79
	25.0%					1.89	1.89
	50.0%					2.78	2.78
	75.0%					4.36	4.36
	97.5%					8.61	8.61
Sonoita	Mean		0.00	7.17	37.69	5.33	12.55
	SD		0.00	3.62	9.13	2.11	2.71
	2.5%		0.00	2.31	21.18	1.50	7.52
	25.0%		0.00	4.54	31.53	3.77	10.62
	50.0%		0.00	6.40	37.08	5.17	12.48
	75.0%		0.00	8.94	43.27	6.73	14.35
	97.5%		0.00	16.35	56.95	9.73	17.99
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	12.13	0.00	9.79	6.80	4.60	6.66
	SD	6.79	0.00	4.33	3.15	2.39	2.04
	2.5%	4.00	0.00	3.43	2.22	1.23	3.42
	25.0%	6.93	0.00	6.60	4.43	2.87	5.29
	50.0%	10.52	0.00	9.24	6.38	4.32	6.45
	75.0%	15.88	0.00	12.15	8.73	5.74	7.68
	97.5%	29.56	0.00	20.21	13.92	10.89	11.71
Valles Centrales	Mean	8.78	0.00	19.47	11.23	9.32	9.76
	SD	3.61	0.00	3.84	2.91	2.06	1.30
	2.5%	3.01	0.00	12.61	6.43	5.56	7.36
	25.0%	6.08	0.00	16.66	9.14	7.89	8.88
	50.0%	8.13	0.00	19.26	10.87	9.21	9.71
	75.0%	10.86	0.00	21.96	13.11	10.63	10.58
	97.5%	17.14	0.00	27.65	17.83	13.64	12.46

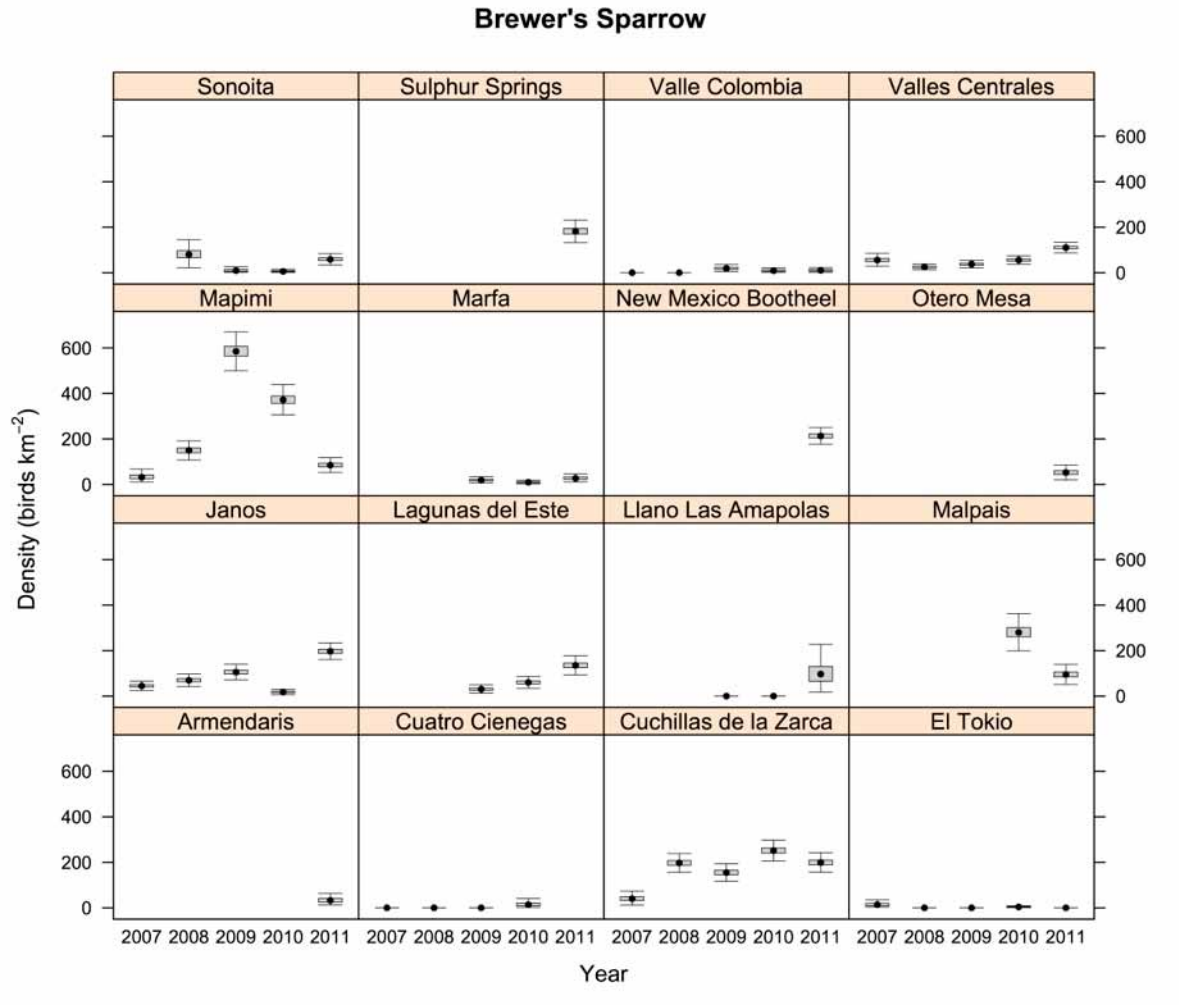

Baird's Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
20
40
60
80
100
2007 2008 2009 2010 2011
Year

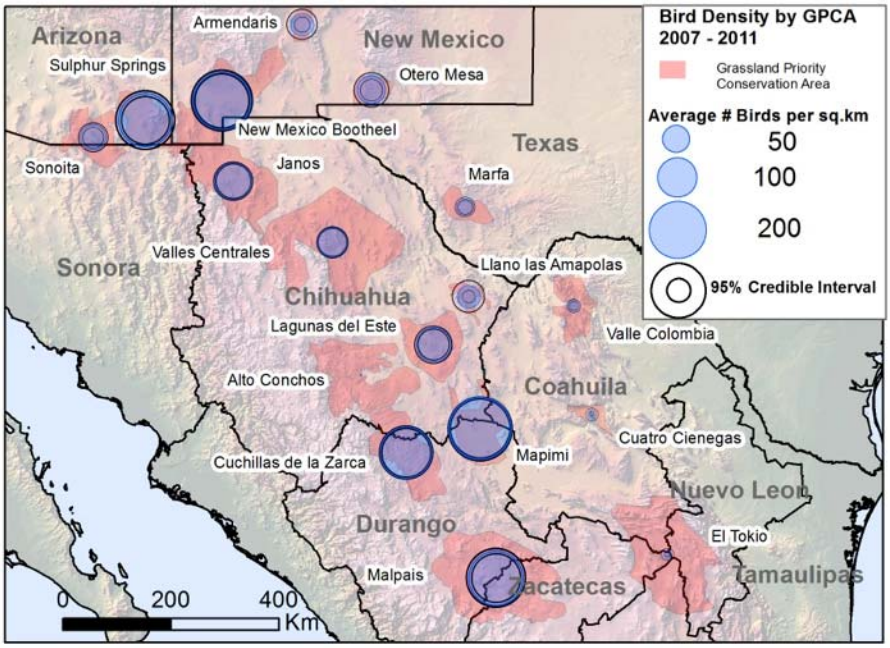

Arizona
Armendaris
New Mexico
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Texas
Sonoita
Janos
Marfa
Valles Centrales
Sonora
Llano las Amapolas
Chihuahua
Lagunas del Este
Valle Colombia
Alto Conchos
Coahuila
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
Nuevo Leon
Durango
El Tokio
Malpais
Zacatecas
Tamaulipas
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
10
20
50
95% Credible Interval

Brewer's Sparrow (*n* = 2,870)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					33.70	33.70
	SD					10.90	10.90
	2.5%					16.77	16.77
	25.0%					25.29	25.29
	50.0%					32.69	32.69
	75.0%					40.59	40.59
	97.5%					58.23	58.23
Cuatro Ciénegas	Mean	0.00	0.00	0.00	16.06		4.02
	SD	0.00	0.00	0.00	9.43		2.36
	2.5%	0.00	0.00	0.00	4.25		1.06
	25.0%	0.00	0.00	0.00	8.64		2.16
	50.0%	0.00	0.00	0.00	13.71		3.43
	75.0%	0.00	0.00	0.00	21.38		5.34
	97.5%	0.00	0.00	0.00	38.45		9.61
Cuchillas de la Zarca	Mean	41.52	198.00	155.49	252.16	199.91	169.42
	SD	12.68	15.83	13.83	17.28	15.69	7.19
	2.5%	20.58	167.30	129.70	219.90	170.30	155.64
	25.0%	32.66	187.40	145.80	240.30	188.90	164.55
	50.0%	39.79	197.60	154.90	251.50	199.50	169.32
	75.0%	48.89	208.20	164.90	263.40	210.50	174.19
	97.5%	71.38	230.80	183.30	287.50	231.30	183.94
El Tokio	Mean	15.98	0.00	0.00	4.31	0.00	4.06
	SD	9.40	0.00	0.00	2.17	0.00	2.05
	2.5%	4.61	0.00	0.00	1.51	0.00	1.55
	25.0%	9.41	0.00	0.00	2.80	0.00	2.61
	50.0%	13.90	0.00	0.00	3.86	0.00	3.61
	75.0%	19.80	0.00	0.00	5.34	0.00	4.95
	97.5%	42.46	0.00	0.00	9.93	0.00	9.69
Janos	Mean	45.54	70.33	105.89	18.05	197.33	87.43
	SD	8.02	10.20	12.89	4.53	13.64	4.88
	2.5%	31.04	52.24	81.48	9.55	171.30	77.98
	25.0%	40.00	63.17	97.04	14.89	188.00	84.13
	50.0%	44.99	69.64	105.60	17.77	196.90	87.33
	75.0%	50.57	76.91	114.30	20.85	206.40	90.69
	97.5%	62.57	92.26	132.30	27.85	225.00	97.16
Lagunas del Este	Mean			31.17	60.88	136.18	76.08
	SD			7.28	10.39	15.39	6.58
	2.5%			18.96	42.30	108.40	63.60
	25.0%			25.98	53.93	125.20	71.53
	50.0%			30.39	59.85	135.70	75.94
	75.0%			35.74	66.98	146.20	80.47
	97.5%			47.16	84.19	168.10	89.35
Llano Las Amapolas	Mean			0.00	0.00	101.60	33.87
	SD			0.00	0.00	46.06	15.35
	2.5%			0.00	0.00	29.46	9.82
	25.0%			0.00	0.00	65.68	21.89
	50.0%			0.00	0.00	96.98	32.33
	75.0%			0.00	0.00	130.50	43.50
	97.5%			0.00	0.00	203.40	67.80
Malpaís	Mean				281.70	96.19	188.94
	SD				30.58	17.44	18.05
	2.5%				225.00	65.09	155.24
	25.0%				260.60	84.41	176.65
	50.0%				280.20	95.12	188.40
	75.0%				301.50	106.50	200.75
	97.5%				345.10	134.40	225.41

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	33.81	149.84	585.75	372.71	85.21	245.46
	SD	12.34	15.95	31.76	24.56	11.92	9.58
	2.5%	15.31	120.20	525.00	326.20	63.14	227.00
	25.0%	24.49	139.00	564.20	356.00	76.80	238.92
	50.0%	31.63	149.30	584.90	371.90	84.76	245.31
	75.0%	41.78	160.10	606.70	389.00	93.09	251.88
	97.5%	61.50	182.90	650.30	421.90	109.80	264.42
Marfa	Mean			19.59	9.80	27.72	19.03
	SD			5.49	3.48	6.73	3.18
	2.5%			10.44	4.57	16.50	13.33
	25.0%			15.81	7.25	22.67	16.78
	50.0%			18.82	9.35	27.11	18.87
	75.0%			22.78	11.79	32.27	21.13
	97.5%			32.06	18.06	41.84	25.74
New Mexico Bootheel	Mean					213.46	213.46
	SD					13.72	13.72
	2.5%					187.70	187.70
	25.0%					204.00	204.00
	50.0%					213.00	213.00
	75.0%					222.50	222.50
	97.5%					241.70	241.70
Otero Mesa	Mean					52.76	52.76
	SD					12.20	12.20
	2.5%					30.48	30.48
	25.0%					44.03	44.03
	50.0%					52.30	52.30
	75.0%					60.46	60.46
	97.5%					78.19	78.19
Sonoita	Mean		83.48	10.45	6.95	59.59	40.12
	SD		26.90	5.67	4.01	9.15	7.57
	2.5%		40.02	2.72	2.25	43.17	27.93
	25.0%		65.48	6.13	4.12	53.14	34.66
	50.0%		80.38	9.25	5.80	58.99	39.40
	75.0%		97.27	13.77	8.58	65.44	44.50
	97.5%		145.80	23.92	17.10	78.95	56.65
Sulphur Springs	Mean					182.32	182.32
	SD					18.16	18.16
	2.5%					148.70	148.70
	25.0%					169.70	169.70
	50.0%					181.60	181.60
	75.0%					194.50	194.50
	97.5%					219.50	219.50
Valle Colombia	Mean	0.00	0.00	19.92	9.88	10.74	8.11
	SD	0.00	0.00	6.82	4.75	4.58	2.10
	2.5%	0.00	0.00	9.72	2.89	3.61	4.03
	25.0%	0.00	0.00	15.06	6.58	7.34	6.71
	50.0%	0.00	0.00	18.88	8.91	10.25	8.07
	75.0%	0.00	0.00	23.49	12.51	13.54	9.46
	97.5%	0.00	0.00	36.08	21.10	21.18	12.33
Valles Centrales	Mean	56.15	25.75	38.05	56.03	111.12	57.42
	SD	10.47	4.80	6.01	7.05	8.69	3.50
	2.5%	37.73	17.03	27.59	43.06	95.17	50.78
	25.0%	48.49	22.41	33.67	51.08	105.00	55.01
	50.0%	55.85	25.46	37.71	55.72	110.70	57.33
	75.0%	63.02	28.88	41.93	60.59	116.80	59.70
	97.5%	77.40	35.82	50.99	70.77	129.00	64.58

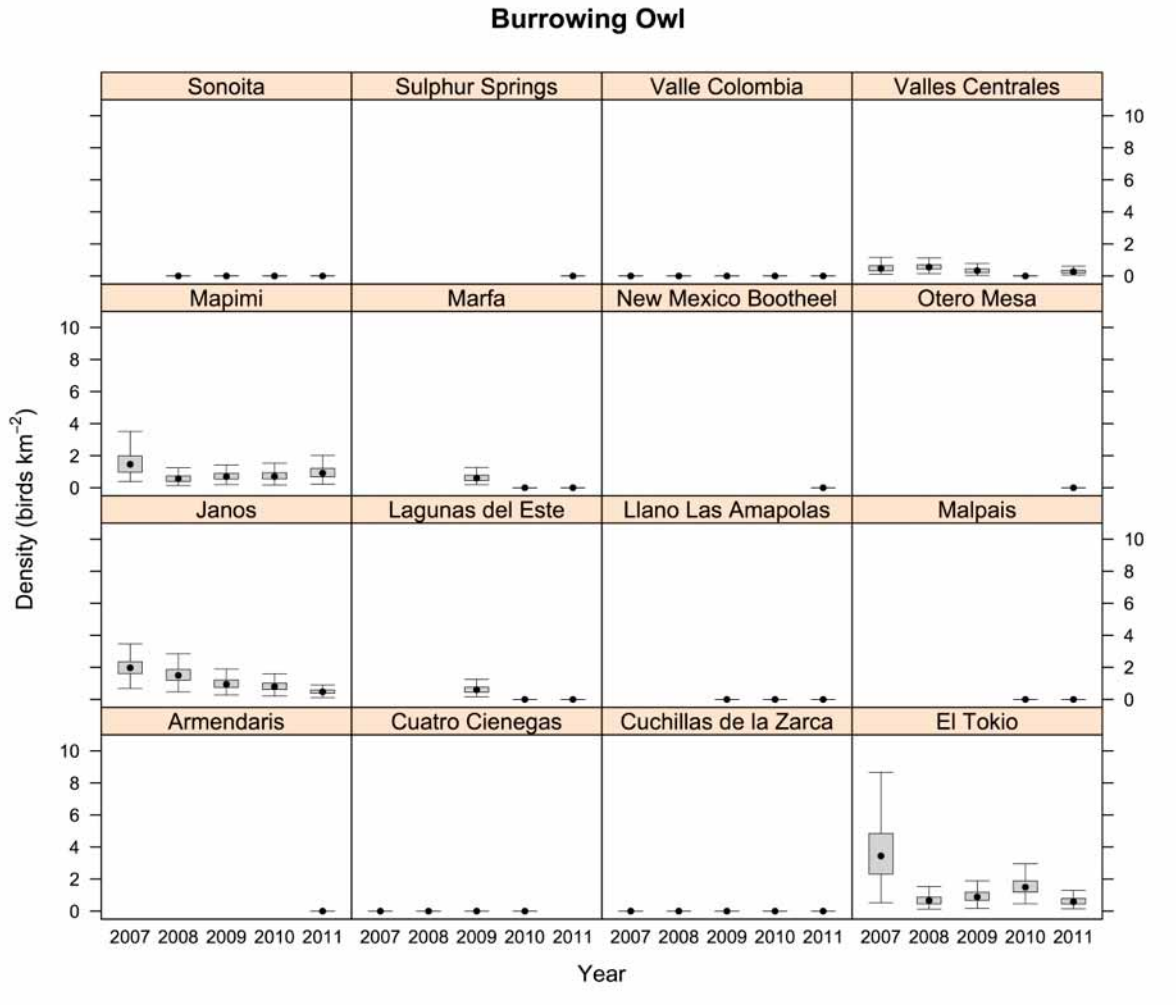

Brewer's Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
200
400
600
2007 2008 2009 2010 2011
Year

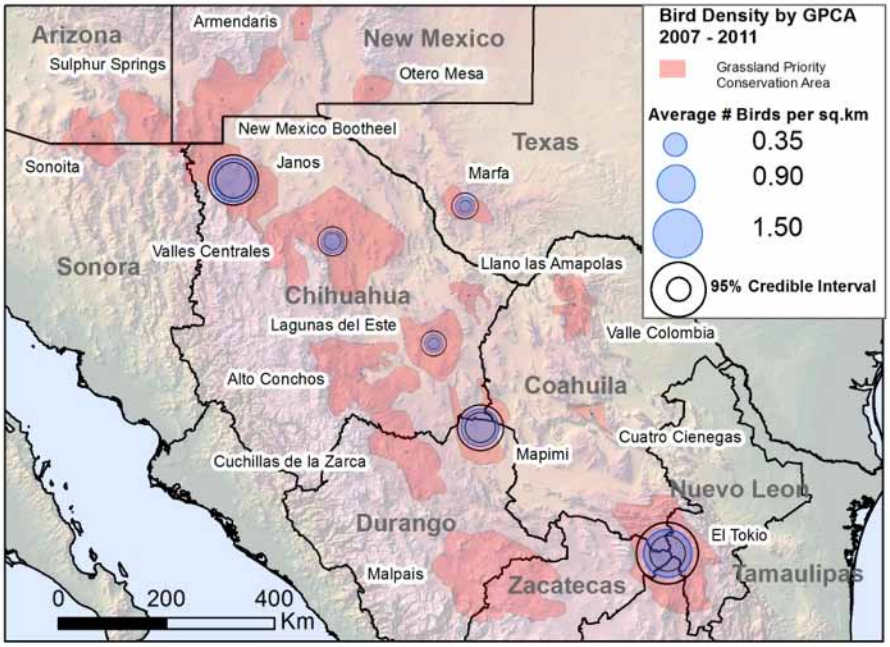

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
50
100
200
95% Credible Interval

Burrowing Owl (*n* = 86)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
El Tokio	Mean	3.71	0.70	0.97	1.57	0.64	1.52
	SD	1.88	0.35	0.39	0.51	0.27	0.44
	2.5%	0.96	0.21	0.41	0.81	0.27	0.81
	25.0%	2.31	0.45	0.68	1.18	0.44	1.19
	50.0%	3.44	0.66	0.88	1.50	0.59	1.47
	75.0%	4.85	0.88	1.17	1.89	0.78	1.79
	97.5%	8.00	1.54	1.98	2.72	1.36	2.50
Janos	Mean	2.02	1.56	1.01	0.83	0.49	1.18
	SD	0.56	0.49	0.35	0.29	0.16	0.21
	2.5%	1.09	0.76	0.47	0.35	0.21	0.82
	25.0%	1.61	1.20	0.76	0.62	0.38	1.03
	50.0%	1.97	1.50	0.95	0.80	0.48	1.17
	75.0%	2.35	1.86	1.21	1.01	0.59	1.32
	97.5%	3.21	2.66	1.82	1.46	0.86	1.61
Lagunas del Este	Mean			0.64	0.00	0.00	0.21
	SD			0.25	0.00	0.00	0.08
	2.5%			0.27	0.00	0.00	0.09
	25.0%			0.45	0.00	0.00	0.15
	50.0%			0.60	0.00	0.00	0.20
	75.0%			0.77	0.00	0.00	0.26
	97.5%			1.22	0.00	0.00	0.41
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.00	0.00	0.00
	SD				0.00	0.00	0.00
	2.5%				0.00	0.00	0.00
	25.0%				0.00	0.00	0.00
	50.0%				0.00	0.00	0.00
	75.0%				0.00	0.00	0.00
	97.5%				0.00	0.00	0.00

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	1.57	0.60	0.75	0.77	0.96	0.93
	SD	0.74	0.26	0.30	0.32	0.37	0.21
	2.5%	0.54	0.23	0.34	0.31	0.36	0.58
	25.0%	0.97	0.40	0.54	0.55	0.68	0.78
	50.0%	1.46	0.57	0.69	0.70	0.91	0.91
	75.0%	1.98	0.74	0.89	0.94	1.22	1.05
	97.5%	3.30	1.27	1.48	1.54	1.71	1.38
Marfa	Mean			0.65	0.00	0.00	0.22
	SD			0.28	0.00	0.00	0.09
	2.5%			0.27	0.00	0.00	0.09
	25.0%			0.46	0.00	0.00	0.15
	50.0%			0.60	0.00	0.00	0.20
	75.0%			0.78	0.00	0.00	0.26
	97.5%			1.37	0.00	0.00	0.46
New Mexico Bootheel	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	0.00	0.00	0.00	0.00
	SD		0.00	0.00	0.00	0.00	0.00
	2.5%		0.00	0.00	0.00	0.00	0.00
	25.0%		0.00	0.00	0.00	0.00	0.00
	50.0%		0.00	0.00	0.00	0.00	0.00
	75.0%		0.00	0.00	0.00	0.00	0.00
	97.5%		0.00	0.00	0.00	0.00	0.00
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Valles Centrales	Mean	0.50	0.59	0.34	0.00	0.29	0.34
	SD	0.23	0.23	0.16	0.00	0.12	0.10
	2.5%	0.16	0.22	0.06	0.00	0.11	0.18
	25.0%	0.32	0.43	0.21	0.00	0.19	0.27
	50.0%	0.47	0.55	0.33	0.00	0.27	0.34
	75.0%	0.66	0.71	0.44	0.00	0.36	0.40
	97.5%	1.00	1.17	0.68	0.00	0.56	0.56

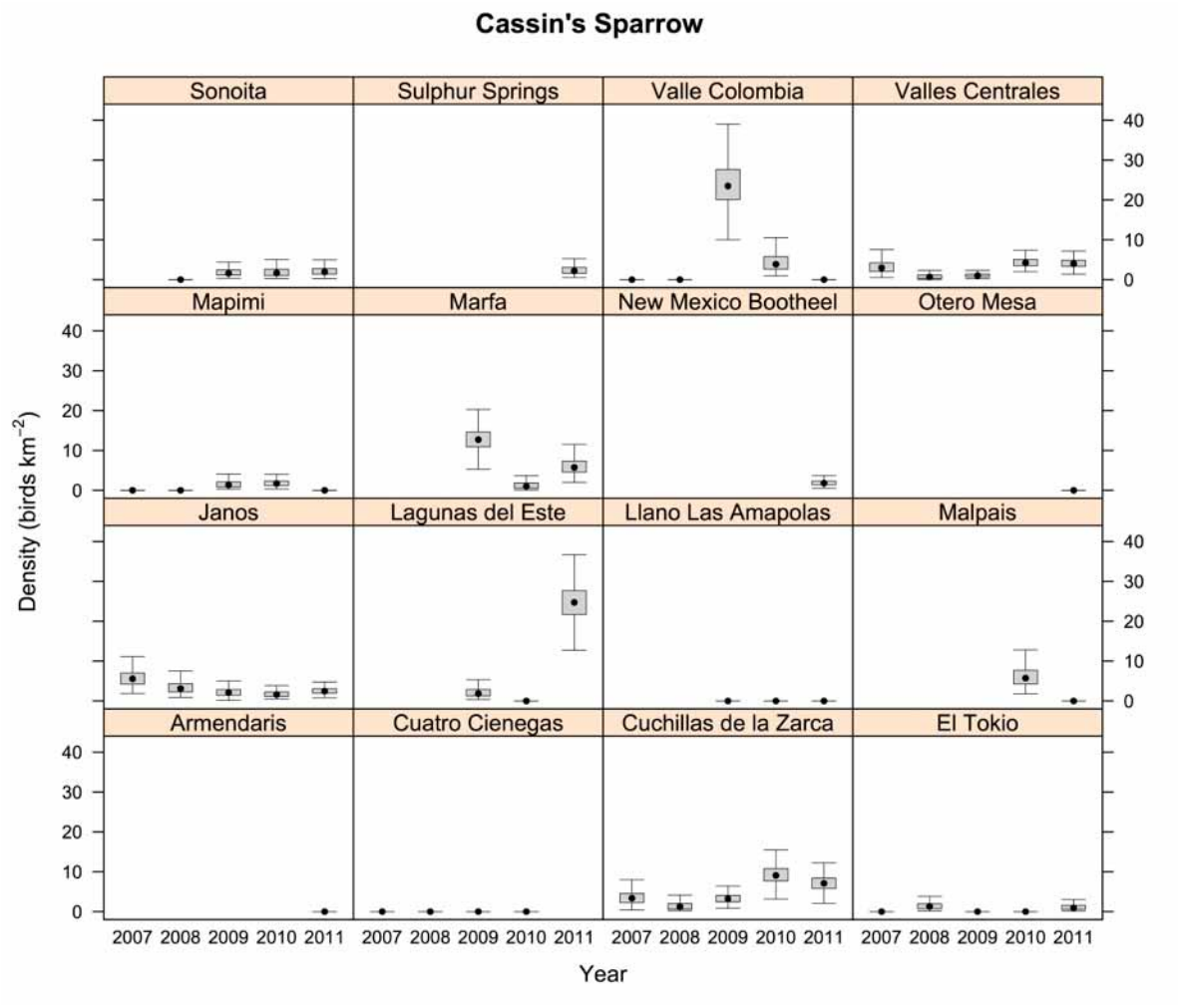

Burrowing Owl
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
2
4
6
8
10
2007 2008 2009 2010 2011
Year

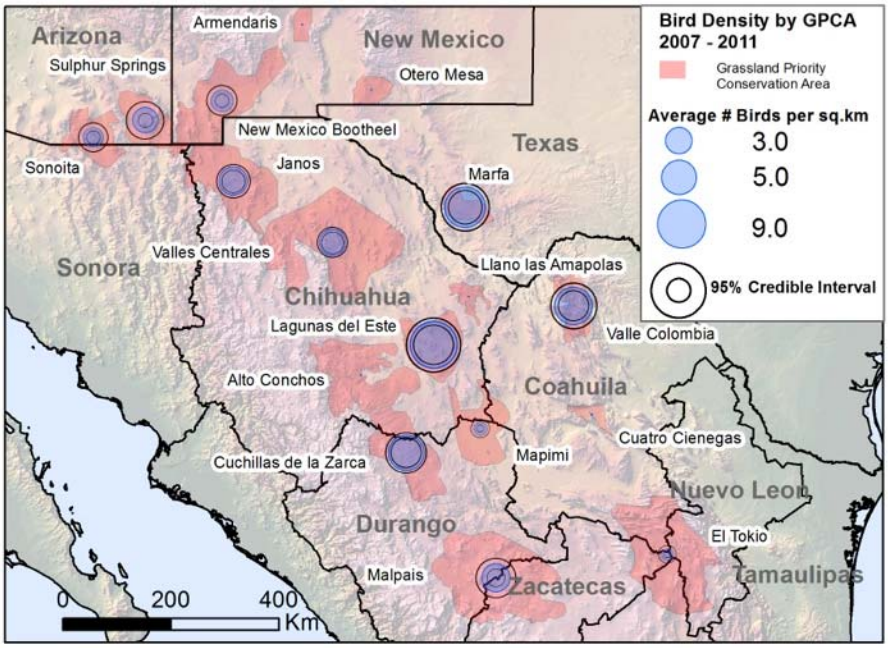

Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.35
0.90
1.50
95% Credible Interval
Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km

Cassin's Sparrow (*n* = 214)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	3.60	1.46	3.41	9.33	7.19	5.00
	SD	1.85	0.95	1.30	2.26	1.97	0.80
	2.5%	0.77	0.36	1.39	5.56	3.72	3.60
	25.0%	2.26	0.62	2.48	7.67	5.82	4.40
	50.0%	3.37	1.25	3.22	9.07	7.07	4.95
	75.0%	4.57	2.03	4.06	10.79	8.38	5.53
	97.5%	7.90	3.71	6.54	14.26	11.54	6.64
El Tokio	Mean	0.00	1.47	0.00	0.00	1.15	0.52
	SD	0.00	0.97	0.00	0.00	0.75	0.27
	2.5%	0.00	0.30	0.00	0.00	0.22	0.19
	25.0%	0.00	0.73	0.00	0.00	0.58	0.34
	50.0%	0.00	1.30	0.00	0.00	0.93	0.47
	75.0%	0.00	1.96	0.00	0.00	1.56	0.64
	97.5%	0.00	4.09	0.00	0.00	2.98	1.26
Janos	Mean	5.78	3.37	2.20	1.79	2.61	3.15
	SD	2.00	1.44	1.13	0.83	0.91	0.59
	2.5%	2.69	1.35	0.30	0.64	1.27	2.11
	25.0%	4.23	2.26	1.42	1.17	1.94	2.73
	50.0%	5.58	3.10	2.09	1.62	2.46	3.11
	75.0%	6.99	4.36	2.87	2.25	3.08	3.53
	97.5%	10.34	6.45	4.83	3.81	4.81	4.39
Lagunas del Este	Mean			2.16	0.00	24.88	9.01
	SD			1.24	0.00	4.31	1.45
	2.5%			0.53	0.00	17.25	6.49
	25.0%			1.25	0.00	21.70	7.97
	50.0%			1.86	0.00	24.71	8.92
	75.0%			2.88	0.00	27.68	9.95
	97.5%			5.08	0.00	34.03	12.10
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				6.29	0.00	3.14
	SD				2.69	0.00	1.34
	2.5%				2.70	0.00	1.35
	25.0%				4.25	0.00	2.12
	50.0%				5.73	0.00	2.86
	75.0%				7.68	0.00	3.84
	97.5%				13.04	0.00	6.52

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	0.00	1.67	1.88	0.00	0.71
	SD	0.00	0.00	1.18	1.02	0.00	0.32
	2.5%	0.00	0.00	0.44	0.51	0.00	0.21
	25.0%	0.00	0.00	0.83	1.20	0.00	0.49
	50.0%	0.00	0.00	1.33	1.70	0.00	0.66
	75.0%	0.00	0.00	2.12	2.33	0.00	0.88
	97.5%	0.00	0.00	4.83	4.67	0.00	1.44
Marfa	Mean			12.81	1.34	6.14	6.77
	SD			2.87	1.11	2.25	1.28
	2.5%			7.50	0.15	2.84	4.40
	25.0%			10.89	0.55	4.55	5.89
	50.0%			12.71	1.03	5.73	6.70
	75.0%			14.64	1.80	7.34	7.59
	97.5%			18.76	4.29	11.70	9.50
New Mexico Bootheel	Mean					1.92	1.92
	SD					0.76	0.76
	2.5%					0.76	0.76
	25.0%					1.40	1.40
	50.0%					1.78	1.78
	75.0%					2.32	2.32
	97.5%					3.77	3.77
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	1.89	2.08	2.14	1.53
	SD		0.00	1.08	1.58	1.17	0.64
	2.5%		0.00	0.56	0.44	0.34	0.72
	25.0%		0.00	1.12	1.02	1.36	1.09
	50.0%		0.00	1.61	1.67	1.94	1.41
	75.0%		0.00	2.44	2.61	2.80	1.75
	97.5%		0.00	4.88	6.12	4.96	3.42
Sulphur Springs	Mean					2.49	2.49
	SD					1.23	1.23
	2.5%					0.88	0.88
	25.0%					1.62	1.62
	50.0%					2.18	2.18
	75.0%					3.08	3.08
	97.5%					5.75	5.75
Valle Colombia	Mean	0.00	0.00	24.11	4.56	0.00	5.73
	SD	0.00	0.00	5.63	2.62	0.00	1.24
	2.5%	0.00	0.00	14.61	1.46	0.00	3.64
	25.0%	0.00	0.00	20.07	2.62	0.00	4.84
	50.0%	0.00	0.00	23.49	3.86	0.00	5.62
	75.0%	0.00	0.00	27.65	5.78	0.00	6.51
	97.5%	0.00	0.00	36.52	11.41	0.00	8.49
Valles Centrales	Mean	3.23	0.79	1.13	4.38	4.14	2.73
	SD	1.56	0.58	0.56	1.22	1.14	0.45
	2.5%	0.88	0.11	0.39	2.51	2.22	1.90
	25.0%	2.04	0.31	0.74	3.50	3.33	2.42
	50.0%	2.98	0.67	1.02	4.21	4.02	2.71
	75.0%	4.22	1.12	1.39	5.05	4.87	3.03
	97.5%	6.66	2.23	2.65	7.20	6.62	3.65

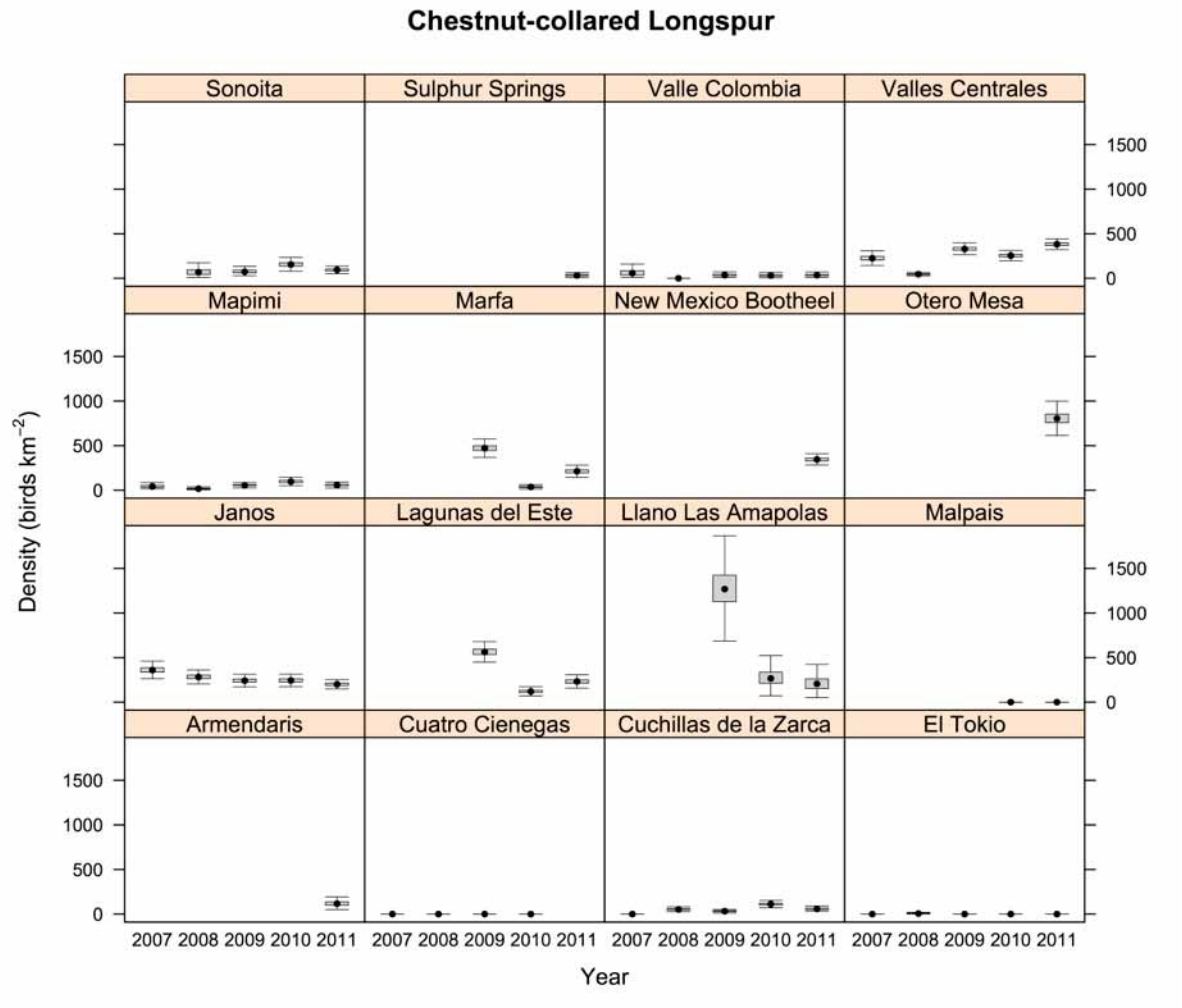

Cassin's Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
10
20
30
40
2007 2008 2009 2010 2011
Year

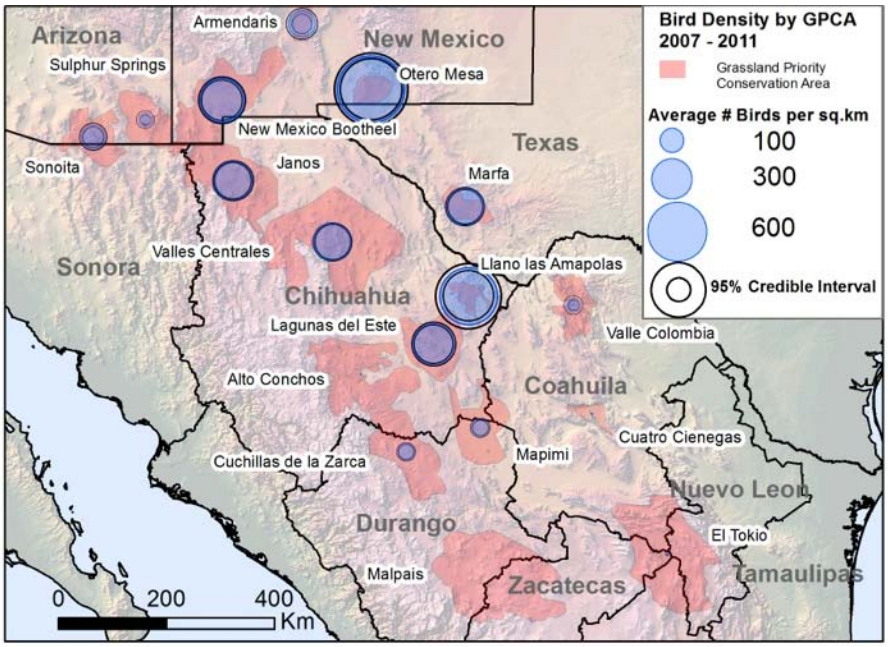

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
3.0
5.0
9.0
95% Credible Interval

Chestnut-collared Longspur (*n* = 2,481)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					119.42	119.42
	SD					28.47	28.47
	2.5%					73.01	73.01
	25.0%					98.76	98.76
	50.0%					116.20	116.20
	75.0%					136.50	136.50
	97.5%					181.90	181.90
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	0.00	53.17	32.62	112.16	59.16	51.42
	SD	0.00	10.46	8.09	15.72	11.59	4.98
	2.5%	0.00	35.15	18.00	83.03	39.59	42.25
	25.0%	0.00	45.85	27.04	101.10	50.71	47.99
	50.0%	0.00	52.30	32.04	111.80	58.29	51.20
	75.0%	0.00	59.55	37.50	122.40	66.44	54.72
	97.5%	0.00	76.11	50.24	144.80	83.77	61.66
El Tokio	Mean	0.00	7.40	0.00	0.00	0.00	1.48
	SD	0.00	4.99	0.00	0.00	0.00	1.00
	2.5%	0.00	1.94	0.00	0.00	0.00	0.39
	25.0%	0.00	3.53	0.00	0.00	0.00	0.71
	50.0%	0.00	5.97	0.00	0.00	0.00	1.19
	75.0%	0.00	10.14	0.00	0.00	0.00	2.03
	97.5%	0.00	20.55	0.00	0.00	0.00	4.11
Janos	Mean	361.53	283.71	241.51	243.80	200.63	266.23
	SD	35.98	29.39	26.72	26.33	19.10	12.68
	2.5%	295.70	230.60	190.40	194.10	164.40	241.74
	25.0%	336.20	263.20	223.40	226.00	187.50	257.54
	50.0%	359.90	282.00	241.10	243.00	200.10	266.02
	75.0%	385.20	302.80	258.90	260.80	213.30	274.70
	97.5%	436.40	346.00	296.30	2.98	239.70	291.42
Lagunas del Este	Mean			563.68	121.65	232.71	306.01
	SD			43.12	19.20	27.56	18.85
	2.5%			481.30	87.91	181.20	270.13
	25.0%			534.40	108.30	213.50	293.03
	50.0%			562.10	120.10	231.80	305.43
	75.0%			592.60	133.90	251.10	318.69
	97.5%			650.60	163.70	288.60	344.13
Llano Las Amapolas	Mean			1289.88	280.52	215.13	595.18
	SD			220.68	99.97	84.38	85.39
	2.5%			929.70	119.60	85.92	443.27
	25.0%			1127.00	211.00	152.00	534.90
	50.0%			1268.00	265.70	205.00	589.13
	75.0%			1423.00	335.50	261.00	649.87
	97.5%			1800.00	518.10	414.80	780.93
Malpaís	Mean				0.00	0.00	0.00
	SD				0.00	0.00	0.00
	2.5%				0.00	0.00	0.00
	25.0%				0.00	0.00	0.00
	50.0%				0.00	0.00	0.00
	75.0%				0.00	0.00	0.00
	97.5%				0.00	0.00	0.00

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	45.86	18.30	56.80	98.07	58.42	55.49
	SD	17.39	6.79	12.00	17.75	12.81	6.62
	2.5%	22.68	7.62	36.86	67.56	36.19	43.78
	25.0%	33.18	13.37	48.52	85.26	49.28	50.71
	50.0%	41.71	17.27	55.85	97.01	57.43	55.15
	75.0%	54.64	22.55	63.51	109.50	66.72	59.75
	97.5%	89.31	33.57	84.50	134.50	85.13	69.41
Marfa	Mean			472.41	37.17	212.78	240.79
	SD			38.62	9.82	25.39	15.94
	2.5%			399.60	19.58	165.20	210.23
	25.0%			445.70	30.11	195.20	229.95
	50.0%			471.70	36.29	212.10	240.45
	75.0%			498.00	43.75	229.70	251.44
	97.5%			550.60	57.66	264.40	272.57
New Mexico Bootheel	Mean					345.67	345.67
	SD					23.59	23.59
	2.5%					301.10	301.10
	25.0%					329.60	329.60
	50.0%					345.20	345.20
	75.0%					361.20	361.20
	97.5%					393.20	393.20
Otero Mesa	Mean					807.49	807.49
	SD					71.25	71.25
	2.5%					675.00	675.00
	25.0%					757.80	757.80
	50.0%					805.20	805.20
	75.0%					854.20	854.20
	97.5%					953.20	953.20
Sonoita	Mean		74.11	77.09	157.32	95.53	101.01
	SD		36.66	22.91	29.89	16.62	14.35
	2.5%		22.82	40.68	105.30	65.40	75.25
	25.0%		44.07	60.64	136.90	84.16	90.98
	50.0%		68.30	74.24	155.10	94.81	100.30
	75.0%		96.41	90.23	175.50	105.70	110.44
	97.5%		157.60	128.20	221.20	130.40	130.83
Sulphur Springs	Mean					33.39	33.39
	SD					11.04	11.04
	2.5%					15.32	15.32
	25.0%					25.10	25.10
	50.0%					32.47	32.47
	75.0%					40.17	40.17
	97.5%					57.83	57.83
Valle Colombia	Mean	66.82	0.00	38.00	32.11	36.80	34.75
	SD	43.80	0.00	14.01	13.10	12.45	10.24
	2.5%	15.25	0.00	16.41	10.82	17.09	20.46
	25.0%	36.15	0.00	27.71	22.70	27.55	27.77
	50.0%	58.13	0.00	36.29	30.63	35.19	33.19
	75.0%	85.39	0.00	46.10	40.12	44.48	39.46
	97.5%	197.10	0.00	70.64	61.94	65.89	61.98
Valles Centrales	Mean	226.42	46.40	330.60	255.20	383.06	248.33
	SD	30.23	8.45	24.67	20.93	22.36	10.47
	2.5%	171.60	31.76	285.70	217.30	340.50	228.41
	25.0%	205.50	40.63	313.40	240.30	367.80	241.11
	50.0%	224.70	45.95	329.40	254.40	382.70	248.20
	75.0%	246.10	51.23	346.90	269.10	397.90	255.30
	97.5%	290.80	64.96	381.50	298.10	427.90	269.32

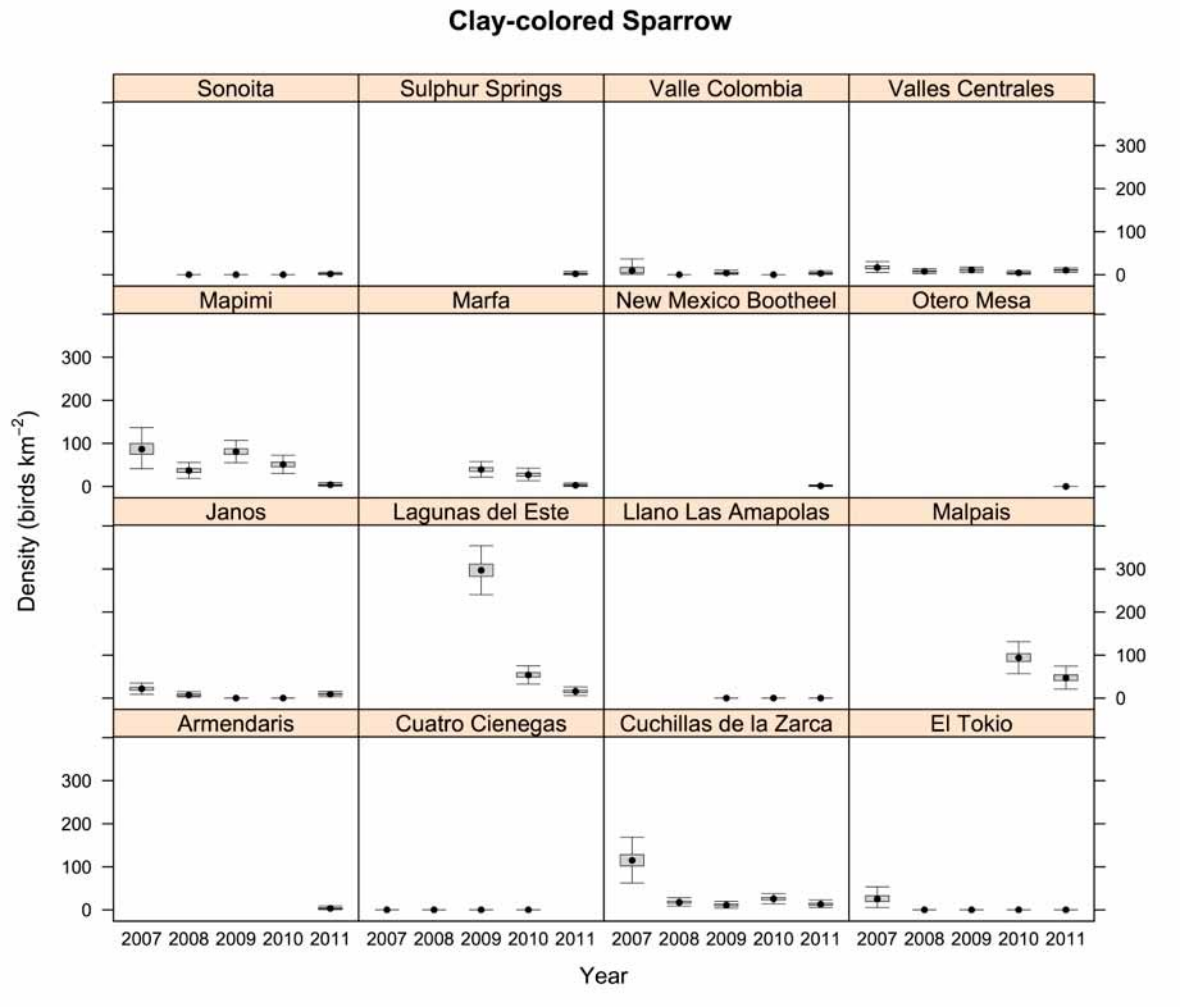

Chestnut-collared Longspur
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
500
1000
1500
2007 2008 2009 2010 2011
Year

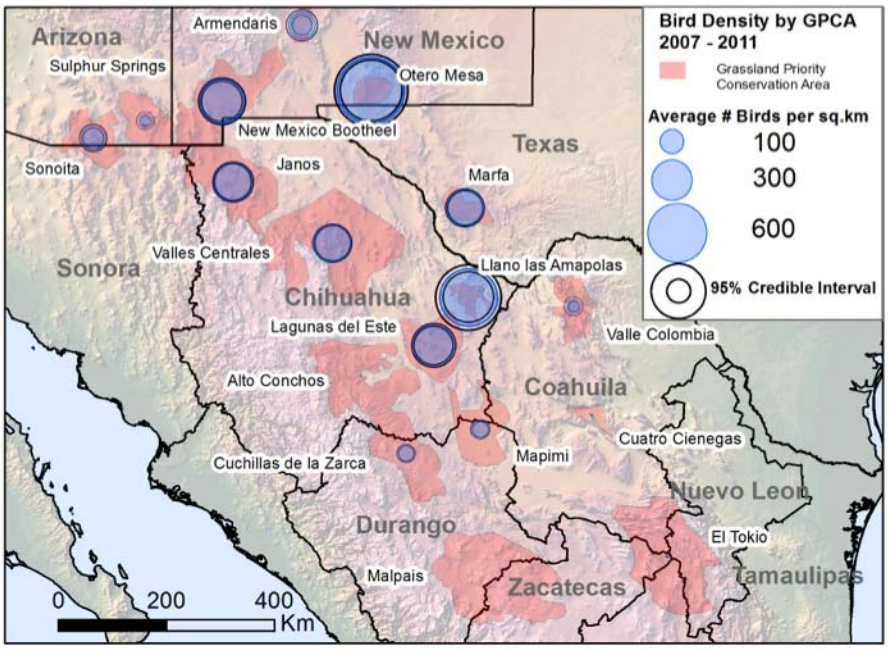

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
100
300
600
95% Credible Interval

Clay-colored Sparrow (*n* = 839)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					3.69	3.69
	SD					2.17	2.17
	2.5%					0.68	0.68
	25.0%					2.12	2.12
	50.0%					3.33	3.33
	75.0%					4.82	4.82
	97.5%					9.24	9.24
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	115.91	17.99	11.19	25.94	13.20	36.84
	SD	20.09	3.78	3.17	4.37	3.53	4.37
	2.5%	78.87	11.86	5.47	18.31	7.50	28.91
	25.0%	101.70	15.27	9.02	22.81	10.53	33.85
	50.0%	114.90	17.58	10.98	25.64	12.80	36.65
	75.0%	128.50	20.28	13.26	28.73	15.46	39.58
	97.5%	157.90	26.74	17.75	34.97	20.80	46.14
El Tokio	Mean	27.60	0.00	0.00	0.00	0.00	5.52
	SD	12.73	0.00	0.00	0.00	0.00	2.55
	2.5%	10.12	0.00	0.00	0.00	0.00	2.02
	25.0%	19.16	0.00	0.00	0.00	0.00	3.83
	50.0%	25.03	0.00	0.00	0.00	0.00	5.01
	75.0%	33.03	0.00	0.00	0.00	0.00	6.61
	97.5%	60.62	0.00	0.00	0.00	0.00	12.12
Janos	Mean	22.05	7.52	0.00	0.00	9.46	7.81
	SD	5.04	2.54	0.00	0.00	2.38	1.29
	2.5%	13.14	3.45	0.00	0.00	5.48	5.46
	25.0%	18.53	5.59	0.00	0.00	7.87	6.89
	50.0%	21.74	7.19	0.00	0.00	9.18	7.75
	75.0%	25.23	9.24	0.00	0.00	10.87	8.62
	97.5%	32.85	13.13	0.00	0.00	14.87	10.55
Lagunas del Este	Mean			297.33	54.04	16.31	122.56
	SD			20.63	7.85	4.26	7.74
	2.5%			258.40	39.63	9.25	107.71
	25.0%			283.00	48.67	13.53	117.26
	50.0%			296.90	53.67	15.91	122.43
	75.0%			311.40	59.21	18.55	127.77
	97.5%			338.20	70.08	26.39	138.03
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				94.60	47.82	71.21
	SD				14.02	10.52	8.89
	2.5%				69.11	29.96	55.11
	25.0%				84.81	40.52	65.15
	50.0%				93.80	46.70	70.60
	75.0%				103.40	54.00	76.64
	97.5%				124.90	71.56	90.50

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	87.87	37.13	81.13	51.20	4.15	52.29
	SD	17.76	6.76	9.52	7.48	1.94	4.71
	2.5%	57.10	24.50	63.68	37.31	1.19	43.76
	25.0%	74.85	32.42	74.44	45.83	2.69	49.07
	50.0%	86.63	36.98	80.69	51.00	3.77	52.05
	75.0%	99.57	41.59	87.47	56.36	5.36	55.24
	97.5%	125.70	50.92	100.70	65.87	8.51	62.37
Marfa	Mean			39.69	27.46	3.16	23.44
	SD			6.64	5.57	1.84	3.02
	2.5%			27.79	17.49	0.85	17.84
	25.0%			35.00	23.54	1.75	21.33
	50.0%			39.24	27.08	2.65	23.31
	75.0%			44.02	31.04	4.26	25.43
	97.5%			53.58	39.52	7.58	29.55
New Mexico Bootheel	Mean					1.54	1.54
	SD					0.80	0.80
	2.5%					0.56	0.56
	25.0%					0.96	0.96
	50.0%					1.31	1.31
	75.0%					1.89	1.89
	97.5%					3.56	3.56
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	0.00	0.00	2.03	0.51
	SD		0.00	0.00	0.00	1.63	0.41
	2.5%		0.00	0.00	0.00	0.26	0.06
	25.0%		0.00	0.00	0.00	0.73	0.18
	50.0%		0.00	0.00	0.00	1.67	0.42
	75.0%		0.00	0.00	0.00	2.76	0.69
	97.5%		0.00	0.00	0.00	6.17	1.54
Sulphur Springs	Mean					2.53	2.53
	SD					1.78	1.78
	2.5%					0.29	0.29
	25.0%					1.18	1.18
	50.0%					2.09	2.09
	75.0%					3.54	3.54
	97.5%					6.78	6.78
Valle Colombia	Mean	11.75	0.00	4.70	0.00	3.92	4.07
	SD	8.54	0.00	3.09	0.00	2.47	2.02
	2.5%	1.76	0.00	1.24	0.00	1.12	1.36
	25.0%	4.35	0.00	2.48	0.00	2.28	2.45
	50.0%	9.77	0.00	3.96	0.00	3.24	3.72
	75.0%	17.22	0.00	5.80	0.00	4.89	5.29
	97.5%	32.39	0.00	13.86	0.00	10.27	8.80
Valles Centrales	Mean	17.15	8.05	11.27	4.64	10.55	10.33
	SD	5.01	2.25	2.61	1.75	2.17	1.36
	2.5%	8.54	4.30	6.54	1.90	6.59	7.86
	25.0%	13.53	6.50	9.45	3.31	9.07	9.42
	50.0%	16.68	7.81	11.12	4.48	10.47	10.27
	75.0%	20.38	9.37	12.92	5.70	11.85	11.14
	97.5%	27.74	13.09	16.89	8.65	15.22	13.26

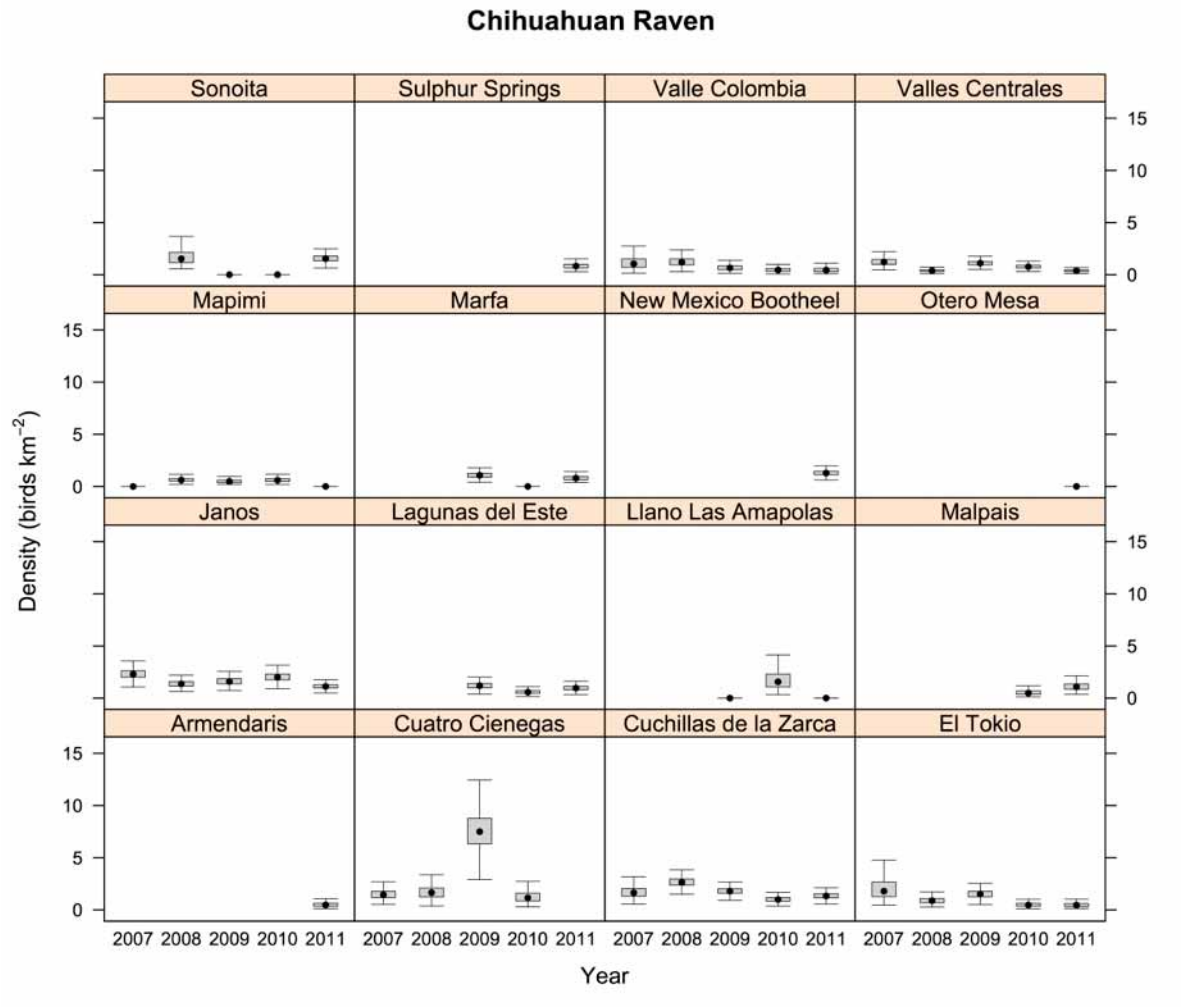

Clay-colored Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
100
200
300
2007 2008 2009 2010 2011
Year

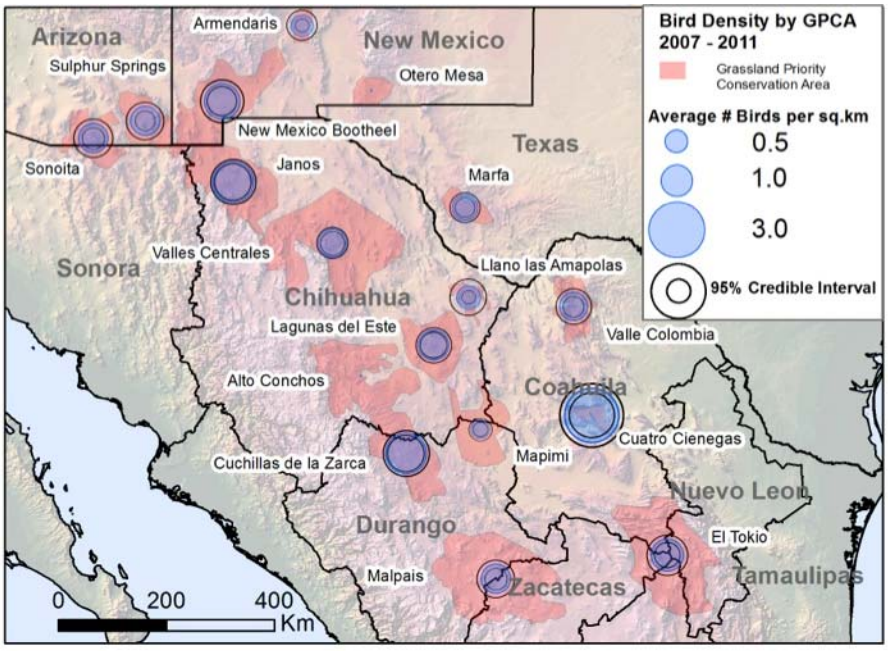

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
100
300
600
95% Credible Interval

Chihuahuan Raven (*n* = 473)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.50	0.50
	SD					0.20	0.20
	2.5%					0.19	0.19
	25.0%					0.34	0.34
	50.0%					0.47	0.47
	75.0%					0.63	0.63
	97.5%					0.96	0.96
Cuatro Ciénegas	Mean	1.52	1.73	7.61	1.25		3.03
	SD	0.49	0.72	1.75	0.54		0.53
	2.5%	0.80	0.65	4.55	0.45		2.01
	25.0%	1.17	1.23	6.32	0.84		2.66
	50.0%	1.44	1.66	7.50	1.16		3.01
	75.0%	1.78	2.09	8.77	1.60		3.38
	97.5%	2.76	3.48	11.28	2.39		4.09
Cuchillas de la Zarca	Mean	1.71	2.69	1.80	1.01	1.34	1.71
	SD	0.56	0.45	0.34	0.26	0.28	0.19
	2.5%	0.78	1.92	1.15	0.53	0.81	1.37
	25.0%	1.30	2.37	1.57	0.83	1.14	1.58
	50.0%	1.64	2.64	1.79	0.99	1.33	1.70
	75.0%	2.05	2.95	2.01	1.17	1.54	1.83
	97.5%	3.00	3.70	2.53	1.55	1.91	2.11
El Tokio	Mean	2.04	0.91	1.53	0.50	0.47	1.09
	SD	0.99	0.30	0.38	0.20	0.20	0.25
	2.5%	0.75	0.45	0.86	0.21	0.18	0.65
	25.0%	1.27	0.68	1.26	0.35	0.32	0.91
	50.0%	1.79	0.87	1.51	0.46	0.45	1.06
	75.0%	2.67	1.09	1.77	0.62	0.60	1.25
	97.5%	4.33	1.57	2.34	0.96	0.90	1.66
Janos	Mean	2.32	1.37	1.64	2.04	1.14	1.70
	SD	0.46	0.30	0.38	0.42	0.24	0.18
	2.5%	1.50	0.84	0.98	1.31	0.70	1.35
	25.0%	2.00	1.16	1.37	1.74	0.97	1.59
	50.0%	2.30	1.36	1.59	2.00	1.12	1.70
	75.0%	2.63	1.57	1.86	2.31	1.29	1.82
	97.5%	3.29	1.99	2.50	2.94	1.66	2.07
Lagunas del Este	Mean			1.21	0.61	0.99	0.94
	SD			0.32	0.21	0.25	0.15
	2.5%			0.65	0.25	0.57	0.67
	25.0%			0.99	0.46	0.81	0.83
	50.0%			1.20	0.57	0.96	0.93
	75.0%			1.40	0.72	1.14	1.03
	97.5%			1.96	1.13	1.55	1.27
Llano Las Amapolas	Mean			0.00	1.80	0.00	0.60
	SD			0.00	0.96	0.00	0.32
	2.5%			0.00	0.57	0.00	0.19
	25.0%			0.00	1.07	0.00	0.36
	50.0%			0.00	1.56	0.00	0.52
	75.0%			0.00	2.31	0.00	0.77
	97.5%			0.00	4.11	0.00	1.37
Malpaís	Mean				0.56	1.15	0.85
	SD				0.28	0.39	0.25
	2.5%				0.19	0.55	0.47
	25.0%				0.36	0.86	0.67
	50.0%				0.49	1.09	0.81
	75.0%				0.69	1.37	0.99
	97.5%				1.31	2.08	1.43

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	0.64	0.50	0.63	0.00	0.35
	SD	0.00	0.20	0.18	0.22	0.00	0.07
	2.5%	0.00	0.31	0.24	0.29	0.00	0.22
	25.0%	0.00	0.50	0.37	0.47	0.00	0.30
	50.0%	0.00	0.61	0.48	0.59	0.00	0.35
	75.0%	0.00	0.76	0.61	0.75	0.00	0.40
	97.5%	0.00	1.10	0.91	1.15	0.00	0.52
Marfa	Mean			1.10	0.00	0.82	0.64
	SD			0.28	0.00	0.22	0.13
	2.5%			0.63	0.00	0.47	0.41
	25.0%			0.90	0.00	0.65	0.55
	50.0%			1.06	0.00	0.79	0.63
	75.0%			1.26	0.00	0.96	0.72
	97.5%			1.73	0.00	1.31	0.92
New Mexico Bootheel	Mean					1.30	1.30
	SD					0.25	0.25
	2.5%					0.85	0.85
	25.0%					1.12	1.12
	50.0%					1.28	1.28
	75.0%					1.47	1.47
	97.5%					1.82	1.82
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		1.79	0.00	0.00	1.58	0.84
	SD		0.90	0.00	0.00	0.36	0.25
	2.5%		0.75	0.00	0.00	0.98	0.49
	25.0%		1.15	0.00	0.00	1.33	0.67
	50.0%		1.53	0.00	0.00	1.54	0.79
	75.0%		2.16	0.00	0.00	1.80	0.97
	97.5%		4.19	0.00	0.00	2.40	1.48
Sulphur Springs	Mean					0.84	0.84
	SD					0.26	0.26
	2.5%					0.40	0.40
	25.0%					0.66	0.66
	50.0%					0.83	0.83
	75.0%					1.00	1.00
	97.5%					1.41	1.41
Valle Colombia	Mean	1.21	1.25	0.70	0.50	0.47	0.83
	SD	0.70	0.43	0.29	0.26	0.23	0.21
	2.5%	0.32	0.53	0.24	0.14	0.16	0.45
	25.0%	0.70	0.94	0.50	0.33	0.28	0.68
	50.0%	1.05	1.20	0.65	0.45	0.43	0.82
	75.0%	1.52	1.51	0.85	0.60	0.62	0.95
	97.5%	2.90	2.19	1.33	1.21	1.02	1.30
Valles Centrales	Mean	1.27	0.40	1.12	0.79	0.39	0.79
	SD	0.37	0.13	0.24	0.20	0.11	0.11
	2.5%	0.70	0.18	0.69	0.44	0.20	0.58
	25.0%	0.99	0.31	0.94	0.65	0.31	0.72
	50.0%	1.22	0.38	1.11	0.77	0.38	0.79
	75.0%	1.48	0.48	1.27	0.91	0.46	0.86
	97.5%	2.16	0.70	1.61	1.21	0.63	1.03

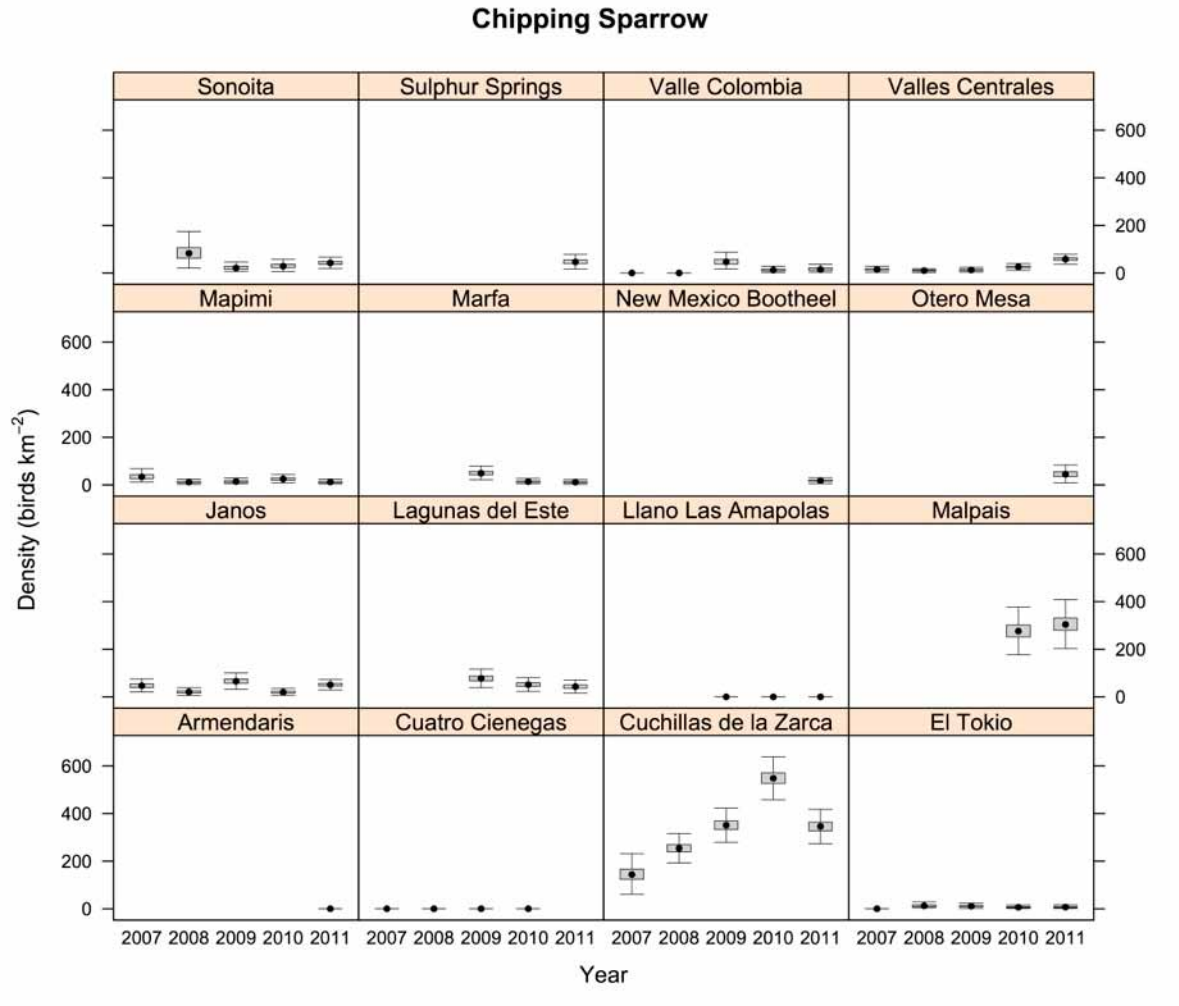

Chihuahuan Raven
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
5
10
15
2007 2008 2009 2010 2011
Year

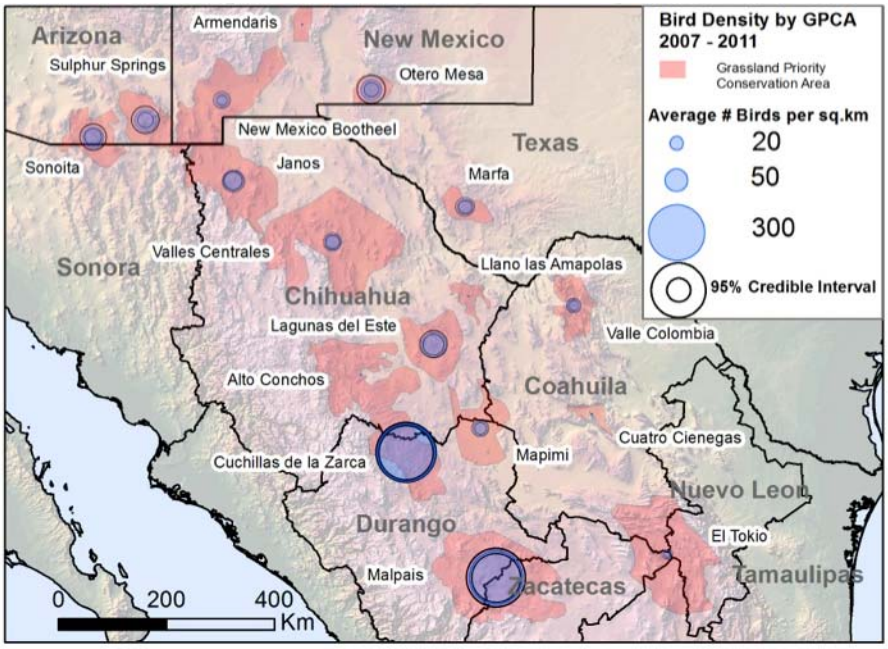

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.5
1.0
3.0
95% Credible Interval

Chipping Sparrow (*n* = 1,357)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	145.79	254.93	351.36	548.74	345.90	329.34
	SD	32.07	22.76	26.78	33.37	26.37	13.80
	2.5%	89.66	212.50	300.20	484.00	295.10	303.04
	25.0%	123.30	238.90	332.90	525.90	327.80	319.92
	50.0%	143.70	254.00	350.80	548.10	345.80	329.20
	75.0%	166.60	269.90	368.90	571.00	363.70	338.50
	97.5%	213.60	301.70	405.10	615.40	397.80	356.88
El Tokio	Mean	0.00	12.96	11.42	6.93	7.58	7.78
	SD	0.00	5.63	4.82	3.19	3.81	1.98
	2.5%	0.00	4.68	3.21	2.20	2.28	4.21
	25.0%	0.00	8.45	7.97	4.57	4.87	6.37
	50.0%	0.00	12.11	10.95	6.30	6.95	7.71
	75.0%	0.00	16.79	14.07	8.80	9.37	9.05
	97.5%	0.00	24.94	23.56	14.56	17.67	11.99
Janos	Mean	47.45	21.56	65.76	19.94	51.13	41.17
	SD	10.37	6.81	12.19	5.90	8.02	4.27
	2.5%	29.66	11.56	42.44	10.11	36.75	33.10
	25.0%	40.03	16.55	57.07	15.72	45.54	38.26
	50.0%	46.57	20.59	65.58	19.28	50.77	40.95
	75.0%	54.22	25.20	74.26	23.55	56.37	43.94
	97.5%	69.43	37.84	88.98	33.50	67.92	50.01
Lagunas del Este	Mean			77.90	51.98	43.52	57.80
	SD			14.53	11.09	10.30	7.38
	2.5%			51.97	32.17	25.41	44.26
	25.0%			67.62	44.30	36.10	52.77
	50.0%			77.31	51.42	42.71	57.45
	75.0%			87.19	58.81	49.85	62.31
	97.5%			107.70	75.86	66.03	73.73
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				277.24	306.10	291.67
	SD				37.68	37.70	27.83
	2.5%				206.30	237.50	239.85
	25.0%				251.90	279.70	272.60
	50.0%				275.90	303.60	290.65
	75.0%				302.00	330.90	309.70
	97.5%				353.40	384.30	349.05

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	35.94	12.57	14.70	25.63	13.00	20.37
	SD	13.75	4.80	5.33	6.99	5.33	3.99
	2.5%	16.19	4.11	6.19	13.62	5.03	13.51
	25.0%	25.98	9.33	10.75	20.47	9.41	17.69
	50.0%	33.90	11.89	14.10	25.17	12.18	19.96
	75.0%	42.91	15.18	17.93	30.08	15.44	22.70
	97.5%	68.08	23.81	26.89	40.74	26.75	28.97
Marfa	Mean			49.83	14.62	12.14	25.53
	SD			10.99	5.32	4.56	4.42
	2.5%			30.32	7.01	4.99	17.94
	25.0%			42.09	10.86	9.02	22.34
	50.0%			48.92	13.74	11.58	25.15
	75.0%			56.85	17.26	14.56	28.33
	97.5%			73.43	27.20	23.80	35.29
New Mexico Bootheel	Mean					17.62	17.62
	SD					4.63	4.63
	2.5%					9.05	9.05
	25.0%					14.51	14.51
	50.0%					17.45	17.45
	75.0%					20.69	20.69
	97.5%					27.09	27.09
Otero Mesa	Mean					45.97	45.97
	SD					14.77	14.77
	2.5%					21.94	21.94
	25.0%					35.09	35.09
	50.0%					44.83	44.83
	75.0%					54.54	54.54
	97.5%					80.64	80.64
Sonoita	Mean		87.28	22.94	30.16	42.84	45.80
	SD		35.04	9.58	11.08	8.90	10.42
	2.5%		32.71	9.97	12.82	26.62	27.98
	25.0%		61.63	16.05	22.17	36.55	38.13
	50.0%		82.56	20.89	28.64	42.24	44.56
	75.0%		106.90	28.03	36.33	48.50	52.79
	97.5%		168.90	45.98	55.65	61.71	67.99
Sulphur Springs	Mean					47.29	47.29
	SD					11.86	11.86
	2.5%					26.33	26.33
	25.0%					39.04	39.04
	50.0%					46.37	46.37
	75.0%					54.67	54.67
	97.5%					72.49	72.49
Valle Colombia	Mean	0.00	0.00	48.06	12.89	17.04	15.60
	SD	0.00	0.00	13.80	5.73	8.51	3.61
	2.5%	0.00	0.00	25.13	4.13	6.12	9.00
	25.0%	0.00	0.00	37.44	8.61	11.17	12.89
	50.0%	0.00	0.00	46.71	12.19	14.87	15.54
	75.0%	0.00	0.00	57.38	16.50	21.31	18.07
	97.5%	0.00	0.00	77.41	26.32	37.32	22.88
Valles Centrales	Mean	15.38	10.29	13.31	25.92	58.41	24.66
	SD	5.65	3.15	4.20	5.60	7.84	2.74
	2.5%	6.39	4.99	6.29	15.22	43.80	19.58
	25.0%	11.63	8.12	10.47	22.20	53.03	22.82
	50.0%	14.58	10.06	12.89	25.71	58.19	24.58
	75.0%	18.12	12.13	15.67	29.39	63.51	26.33
	97.5%	28.86	17.14	23.36	37.77	74.77	30.44

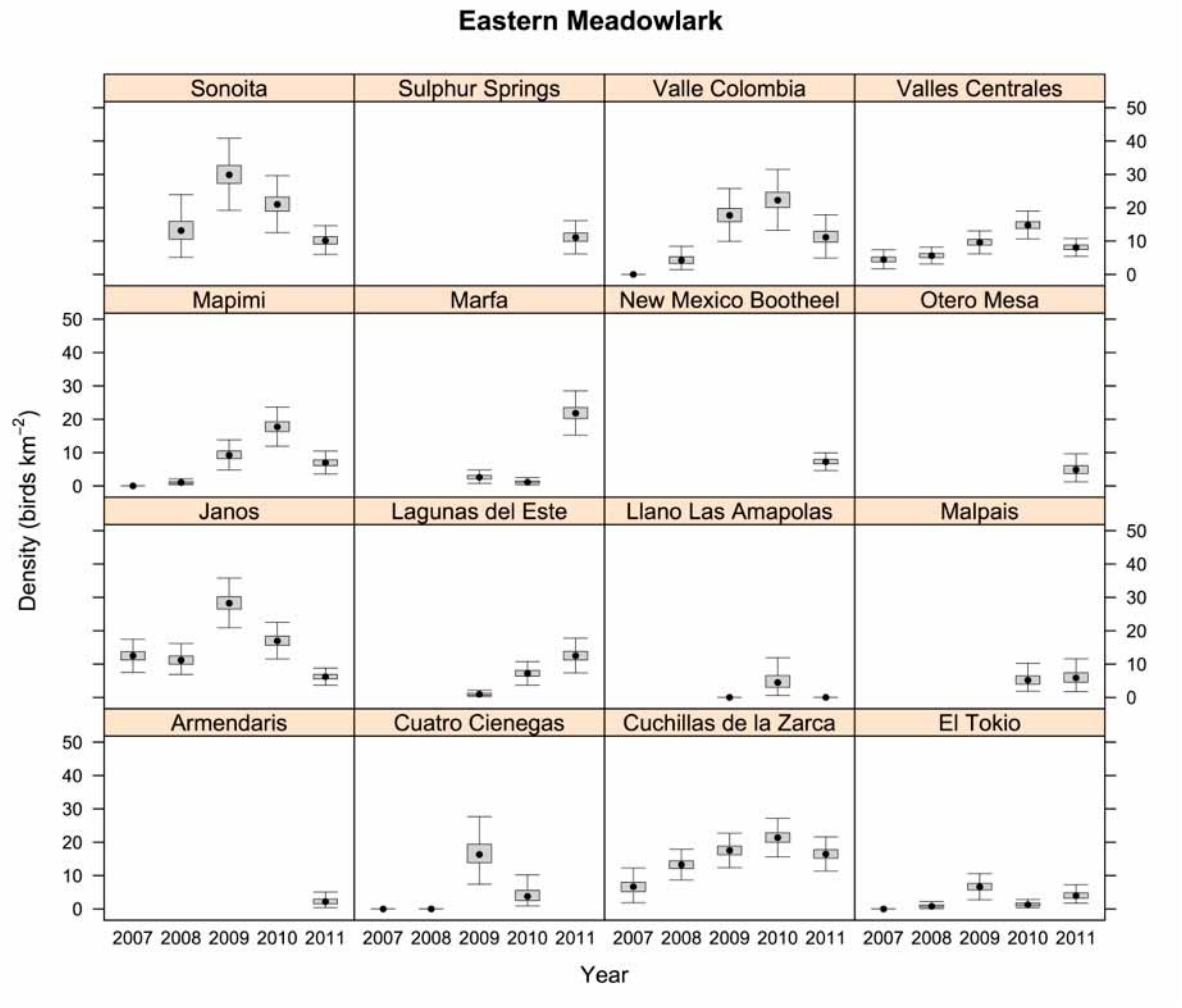

Chipping Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
200
400
600
2007 2008 2009 2010 2011
Year

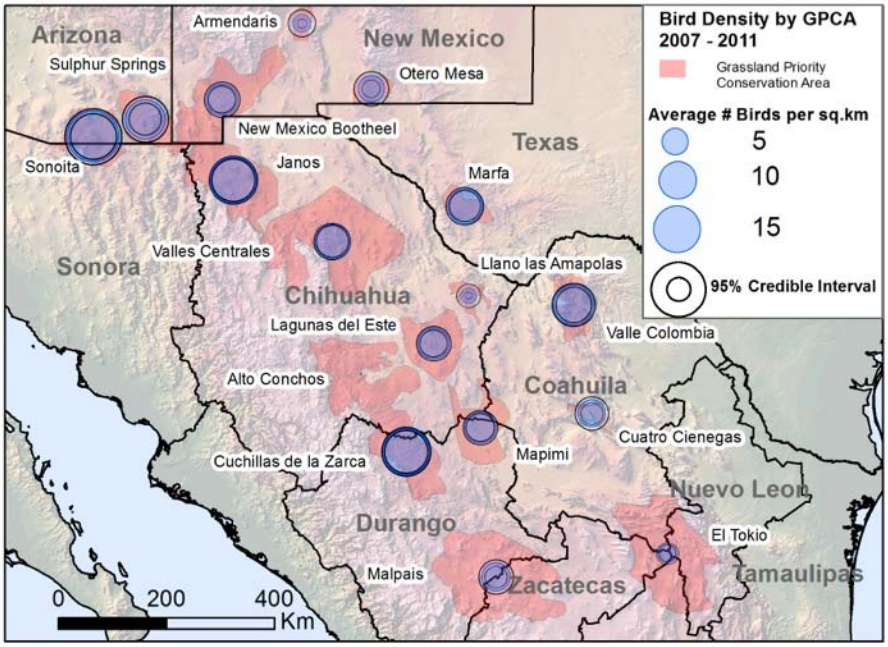

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
20
50
300
95% Credible Interval
0
200
400
Km

Eastern Meadowlark (*n* = 1,668)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					2.38	2.38
	SD					1.19	1.19
	2.5%					0.70	0.70
	25.0%					1.55	1.55
	50.0%					2.16	2.16
	75.0%					2.97	2.97
	97.5%					5.34	5.34
Cuatro Ciénegas	Mean	0.00	0.00	16.87	4.25		5.28
	SD	0.00	0.00	4.09	2.21		1.15
	2.5%	0.00	0.00	10.17	1.35		3.32
	25.0%	0.00	0.00	13.85	2.48		4.47
	50.0%	0.00	0.00	16.33	3.77		5.17
	75.0%	0.00	0.00	19.40	5.56		5.98
	97.5%	0.00	0.00	25.99	9.50		7.92
Cuchillas de la Zarca	Mean	6.72	13.32	17.57	21.44	16.54	15.12
	SD	2.29	1.65	1.91	2.11	1.92	0.93
	2.5%	2.88	10.37	13.90	17.62	13.01	13.33
	25.0%	5.18	12.12	16.26	19.95	15.20	14.48
	50.0%	6.66	13.25	17.53	21.37	16.45	15.09
	75.0%	8.02	14.44	18.83	22.85	17.75	15.73
	97.5%	11.61	16.65	21.38	25.79	20.56	16.99
El Tokio	Mean	0.00	0.91	6.71	1.40	4.12	2.63
	SD	0.00	0.52	1.42	0.60	1.16	0.39
	2.5%	0.00	0.26	4.21	0.55	2.30	1.92
	25.0%	0.00	0.52	5.68	0.96	3.23	2.36
	50.0%	0.00	0.76	6.61	1.27	3.99	2.62
	75.0%	0.00	1.20	7.65	1.73	4.85	2.88
	97.5%	0.00	2.19	9.70	2.84	6.77	3.43
Janos	Mean	12.50	11.30	28.41	17.06	6.25	15.10
	SD	1.77	1.75	2.79	2.02	0.97	0.91
	2.5%	9.21	8.33	23.33	13.49	4.47	13.39
	25.0%	11.22	9.99	26.48	15.62	5.58	14.47
	50.0%	12.49	11.16	28.25	16.94	6.22	15.08
	75.0%	13.71	12.46	30.20	18.38	6.89	15.70
	97.5%	16.05	14.98	34.29	21.33	8.24	16.97
Lagunas del Este	Mean			1.05	7.28	12.59	6.97
	SD			0.50	1.39	1.97	0.84
	2.5%			0.41	4.73	9.10	5.43
	25.0%			0.68	6.35	11.21	6.38
	50.0%			0.96	7.21	12.50	6.94
	75.0%			1.27	8.13	13.83	7.52
	97.5%			2.43	10.29	16.79	8.71
Llano Las Amapolas	Mean			0.00	5.02	0.00	1.67
	SD			0.00	2.80	0.00	0.93
	2.5%			0.00	1.05	0.00	0.35
	25.0%			0.00	2.98	0.00	0.99
	50.0%			0.00	4.47	0.00	1.49
	75.0%			0.00	6.57	0.00	2.19
	97.5%			0.00	12.00	0.00	4.00
Malpaís	Mean				5.35	6.09	5.72
	SD				1.74	2.00	1.27
	2.5%				2.58	2.92	3.46
	25.0%				4.00	4.55	4.81
	50.0%				5.18	5.88	5.65
	75.0%				6.49	7.38	6.53
	97.5%				9.16	10.63	8.45

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	1.05	9.36	17.86	7.03	7.06
	SD	0.00	0.38	1.67	2.19	1.33	0.62
	2.5%	0.00	0.46	6.38	13.92	4.54	5.91
	25.0%	0.00	0.75	8.20	16.33	6.13	6.63
	50.0%	0.00	1.02	9.22	17.72	6.97	7.03
	75.0%	0.00	1.31	10.46	19.26	7.85	7.46
	97.5%	0.00	1.88	12.82	22.55	9.92	8.39
Marfa	Mean			2.67	1.21	21.89	8.59
	SD			0.82	0.52	2.51	0.88
	2.5%			1.20	0.43	17.20	6.93
	25.0%			2.11	0.83	20.19	8.00
	50.0%			2.60	1.09	21.81	8.57
	75.0%			3.20	1.50	23.50	9.16
	97.5%			4.41	2.49	27.07	10.37
New Mexico Bootheel	Mean					7.30	7.30
	SD					0.99	0.99
	2.5%					5.42	5.42
	25.0%					6.62	6.62
	50.0%					7.26	7.26
	75.0%					7.96	7.96
	97.5%					9.34	9.34
Otero Mesa	Mean					5.01	5.01
	SD					1.67	1.67
	2.5%					2.34	2.34
	25.0%					3.72	3.72
	50.0%					4.87	4.87
	75.0%					6.10	6.10
	97.5%					8.48	8.48
Sonoita	Mean		13.61	30.04	21.19	10.31	18.79
	SD		4.26	4.13	3.26	1.64	1.83
	2.5%		7.02	22.22	15.37	7.56	15.49
	25.0%		10.55	27.30	18.95	9.12	17.52
	50.0%		13.14	29.88	20.99	10.17	18.69
	75.0%		15.91	32.70	23.23	11.34	19.91
	97.5%		24.18	38.69	28.23	13.94	22.74
Sulphur Springs	Mean					11.18	11.18
	SD					1.90	1.90
	2.5%					7.57	7.57
	25.0%					9.90	9.90
	50.0%					11.11	11.11
	75.0%					12.39	12.39
	97.5%					15.12	15.12
Valle Colombia	Mean	0.00	4.41	17.89	22.42	11.50	11.24
	SD	0.00	1.40	3.07	3.47	2.61	1.10
	2.5%	0.00	2.32	12.26	15.76	7.13	9.13
	25.0%	0.00	3.28	15.83	20.07	9.70	10.50
	50.0%	0.00	4.25	17.73	22.26	11.14	11.22
	75.0%	0.00	5.35	19.79	24.63	12.98	11.96
	97.5%	0.00	7.52	24.54	29.79	17.75	13.50
Valles Centrales	Mean	4.56	5.70	9.66	14.82	8.14	8.58
	SD	1.14	0.93	1.24	1.56	0.99	0.55
	2.5%	2.68	4.08	7.42	11.88	6.22	7.54
	25.0%	3.77	5.04	8.77	13.76	7.46	8.19
	50.0%	4.48	5.63	9.61	14.77	8.11	8.55
	75.0%	5.22	6.30	10.49	15.84	8.81	8.94
	97.5%	6.98	7.62	12.24	17.98	10.12	9.71

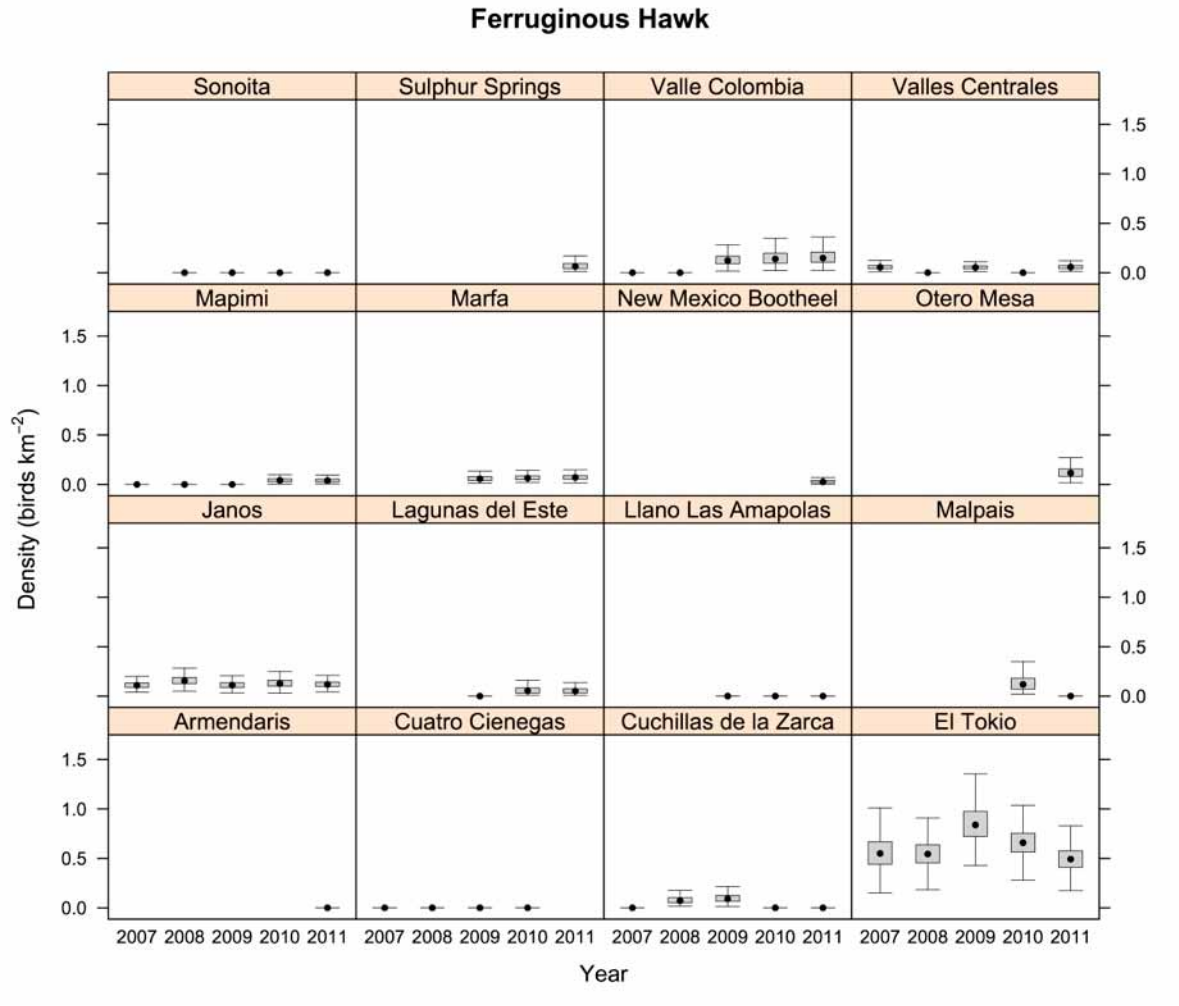

Eastern Meadowlark
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
10
20
30
40
50
2007 2008 2009 2010 2011
Year

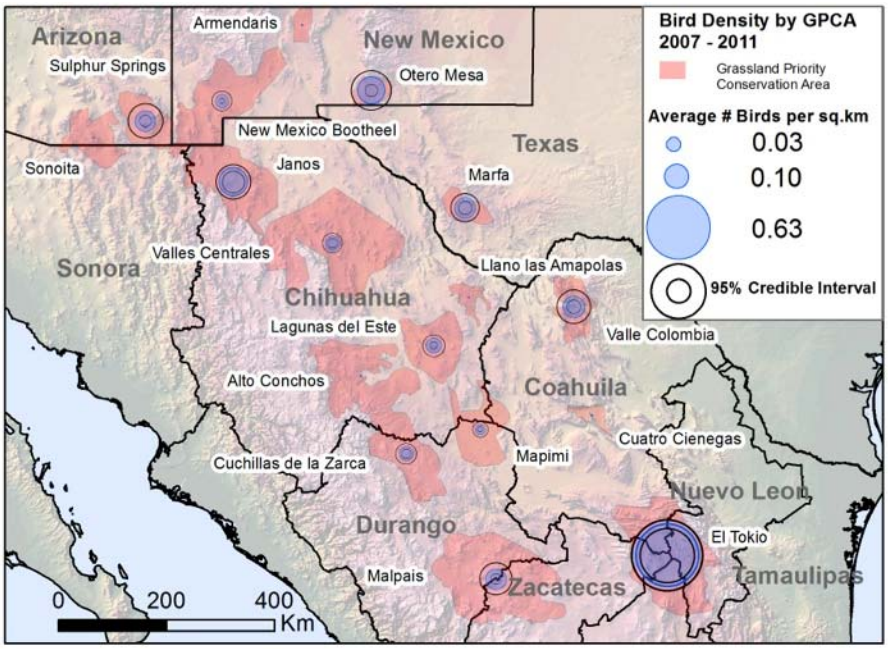

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
5
10
15
95% Credible Interval

Ferruginous Hawk (*n* = 122)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	0.00	0.08	0.10	0.00	0.00	0.04
	SD	0.00	0.04	0.04	0.00	0.00	0.01
	2.5%	0.00	0.03	0.03	0.00	0.00	0.01
	25.0%	0.00	0.05	0.07	0.00	0.00	0.03
	50.0%	0.00	0.07	0.09	0.00	0.00	0.03
	75.0%	0.00	0.10	0.13	0.00	0.00	0.04
	97.5%	0.00	0.17	0.19	0.00	0.00	0.07
El Tokio	Mean	0.57	0.55	0.86	0.67	0.50	0.63
	SD	0.19	0.13	0.19	0.14	0.13	0.09
	2.5%	0.24	0.32	0.56	0.42	0.28	0.47
	25.0%	0.44	0.45	0.72	0.56	0.41	0.56
	50.0%	0.55	0.54	0.84	0.66	0.49	0.62
	75.0%	0.67	0.64	0.98	0.75	0.58	0.69
	97.5%	1.01	0.82	1.30	0.97	0.78	0.82
Janos	Mean	0.11	0.17	0.11	0.13	0.12	0.13
	SD	0.03	0.06	0.04	0.05	0.04	0.03
	2.5%	0.06	0.09	0.05	0.06	0.06	0.08
	25.0%	0.09	0.13	0.09	0.10	0.10	0.11
	50.0%	0.11	0.15	0.11	0.13	0.12	0.13
	75.0%	0.13	0.19	0.14	0.16	0.14	0.15
	97.5%	0.19	0.34	0.20	0.24	0.22	0.19
Lagunas del Este	Mean			0.00	0.06	0.05	0.04
	SD			0.00	0.03	0.03	0.02
	2.5%			0.00	0.01	0.01	0.01
	25.0%			0.00	0.03	0.03	0.02
	50.0%			0.00	0.06	0.05	0.04
	75.0%			0.00	0.08	0.07	0.05
	97.5%			0.00	0.14	0.11	0.08
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.14	0.00	0.07
	SD				0.08	0.00	0.04
	2.5%				0.04	0.00	0.02
	25.0%				0.07	0.00	0.04
	50.0%				0.12	0.00	0.06
	75.0%				0.18	0.00	0.09
	97.5%				0.35	0.00	0.17

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	0.00	0.00	0.04	0.04	0.02
	SD	0.00	0.00	0.00	0.02	0.02	0.01
	2.5%	0.00	0.00	0.00	0.01	0.01	0.01
	25.0%	0.00	0.00	0.00	0.03	0.03	0.01
	50.0%	0.00	0.00	0.00	0.04	0.04	0.02
	75.0%	0.00	0.00	0.00	0.06	0.05	0.02
	97.5%	0.00	0.00	0.00	0.10	0.11	0.04
Marfa	Mean			0.06	0.07	0.07	0.07
	SD			0.03	0.03	0.03	0.03
	2.5%			0.02	0.03	0.03	0.03
	25.0%			0.04	0.05	0.05	0.05
	50.0%			0.06	0.06	0.07	0.06
	75.0%			0.08	0.09	0.09	0.08
	97.5%			0.15	0.13	0.15	0.13
New Mexico Bootheel	Mean					0.03	0.03
	SD					0.02	0.02
	2.5%					0.00	0.00
	25.0%					0.02	0.02
	50.0%					0.03	0.03
	75.0%					0.04	0.04
	97.5%					0.07	0.07
Otero Mesa	Mean					0.12	0.12
	SD					0.06	0.06
	2.5%					0.03	0.03
	25.0%					0.08	0.08
	50.0%					0.12	0.12
	75.0%					0.16	0.16
	97.5%					0.26	0.26
Sonoita	Mean		0.00	0.00	0.00	0.00	0.00
	SD		0.00	0.00	0.00	0.00	0.00
	2.5%		0.00	0.00	0.00	0.00	0.00
	25.0%		0.00	0.00	0.00	0.00	0.00
	50.0%		0.00	0.00	0.00	0.00	0.00
	75.0%		0.00	0.00	0.00	0.00	0.00
	97.5%		0.00	0.00	0.00	0.00	0.00
Sulphur Springs	Mean					0.07	0.07
	SD					0.04	0.04
	2.5%					0.02	0.02
	25.0%					0.04	0.04
	50.0%					0.06	0.06
	75.0%					0.09	0.09
	97.5%					0.19	0.19
Valle Colombia	Mean	0.00	0.00	0.13	0.15	0.17	0.09
	SD	0.00	0.00	0.06	0.07	0.08	0.04
	2.5%	0.00	0.00	0.04	0.05	0.05	0.03
	25.0%	0.00	0.00	0.09	0.10	0.11	0.06
	50.0%	0.00	0.00	0.12	0.14	0.15	0.08
	75.0%	0.00	0.00	0.17	0.20	0.21	0.11
	97.5%	0.00	0.00	0.27	0.32	0.37	0.18
Valles Centrales	Mean	0.06	0.00	0.06	0.00	0.06	0.04
	SD	0.03	0.00	0.02	0.00	0.02	0.01
	2.5%	0.02	0.00	0.02	0.00	0.02	0.02
	25.0%	0.04	0.00	0.04	0.00	0.04	0.03
	50.0%	0.05	0.00	0.05	0.00	0.06	0.03
	75.0%	0.07	0.00	0.07	0.00	0.07	0.04
	97.5%	0.13	0.00	0.10	0.00	0.11	0.07

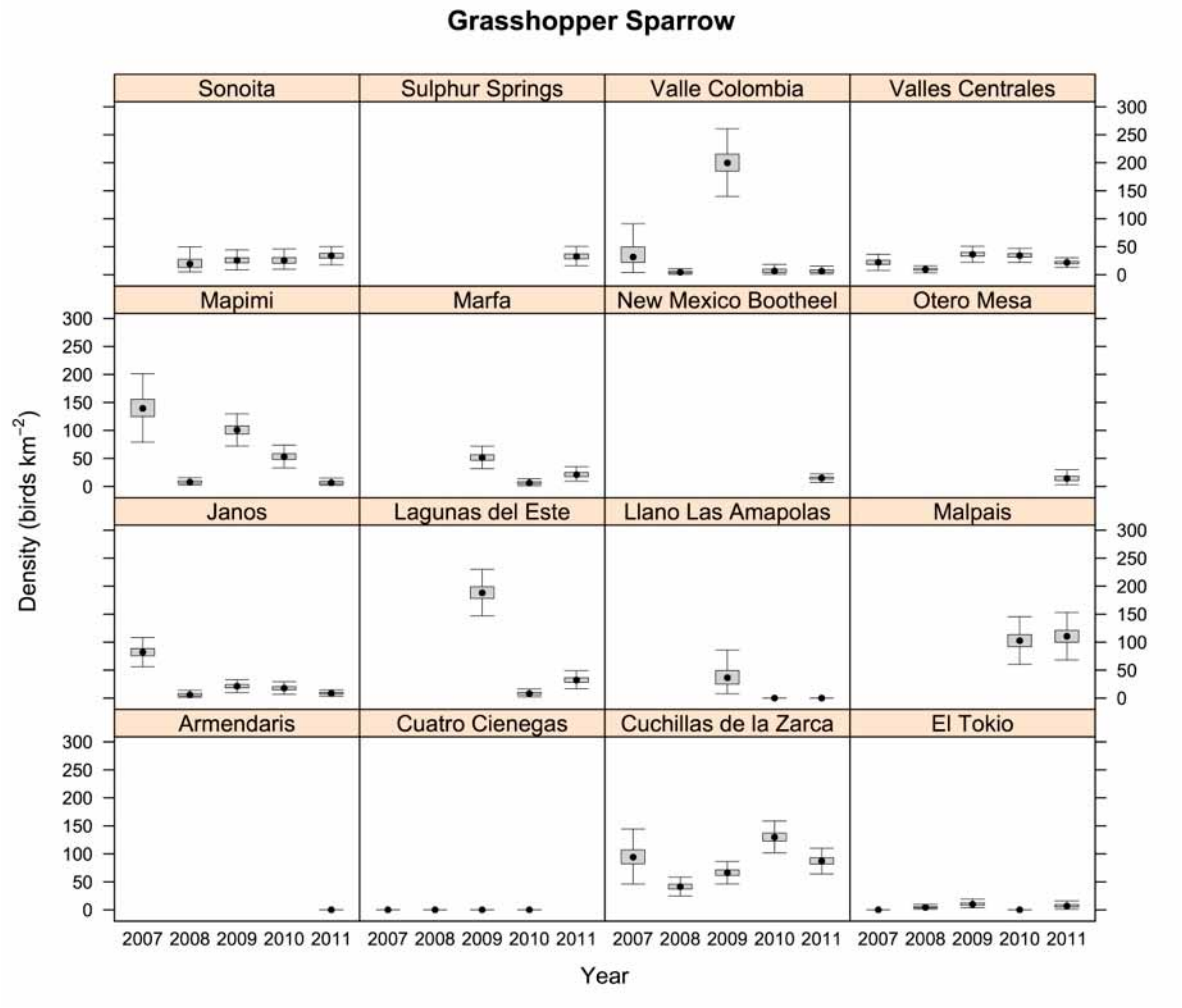

Ferruginous Hawk
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0.0
0.5
1.0
1.5
2007 2008 2009 2010 2011
Year

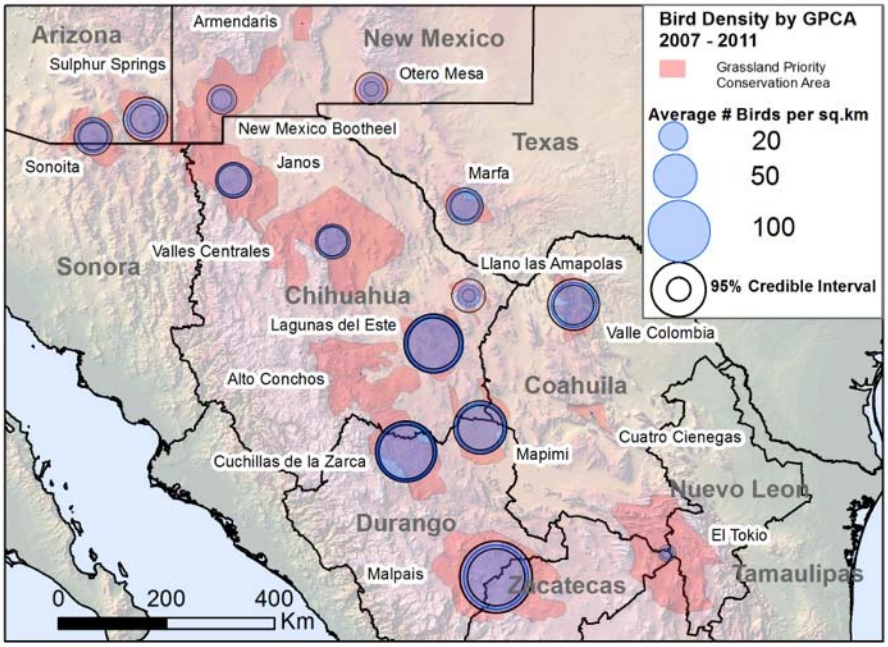

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.03
0.10
0.63
95% Credible Interval
0
200
400
Km

Grasshopper Sparrow (*n* = 1,489)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	94.98	41.58	66.53	130.12	87.46	84.14
	SD	18.04	6.01	7.45	10.72	8.59	5.21
	2.5%	61.04	30.64	52.81	109.80	71.29	74.09
	25.0%	82.33	37.22	61.37	122.90	81.63	80.60
	50.0%	94.11	41.43	66.24	129.80	87.15	84.09
	75.0%	107.20	45.70	71.33	137.10	93.07	87.65
	97.5%	131.20	53.70	82.06	151.80	105.10	94.44
El Tokio	Mean	0.00	4.74	10.37	0.00	7.38	4.50
	SD	0.00	2.05	3.37	0.00	3.26	1.09
	2.5%	0.00	1.93	5.14	0.00	1.86	2.62
	25.0%	0.00	3.24	7.88	0.00	5.01	3.72
	50.0%	0.00	4.29	10.03	0.00	6.96	4.39
	75.0%	0.00	5.82	12.42	0.00	9.36	5.16
	97.5%	0.00	9.91	18.12	0.00	14.60	6.87
Janos	Mean	82.48	6.27	21.55	18.09	8.97	27.47
	SD	9.73	2.83	4.42	4.18	2.28	2.57
	2.5%	64.38	2.24	13.74	11.01	5.16	22.60
	25.0%	75.78	4.05	18.43	15.05	7.40	25.69
	50.0%	82.00	5.86	21.30	17.77	8.67	27.43
	75.0%	88.75	8.11	24.26	20.70	10.29	29.20
	97.5%	103.10	12.60	31.13	27.25	14.17	32.60
Lagunas del Este	Mean			188.53	8.18	32.68	76.46
	SD			15.59	2.76	6.02	5.78
	2.5%			158.90	3.44	22.26	65.47
	25.0%			178.00	6.04	28.36	72.51
	50.0%			188.00	8.06	32.25	76.35
	75.0%			198.80	10.14	36.62	80.36
	97.5%			220.10	13.74	45.47	87.96
Llano Las Amapolas	Mean			39.55	0.00	0.00	13.18
	SD			18.92	0.00	0.00	6.31
	2.5%			11.99	0.00	0.00	4.00
	25.0%			25.22	0.00	0.00	8.41
	50.0%			36.39	0.00	0.00	12.13
	75.0%			49.52	0.00	0.00	16.51
	97.5%			85.08	0.00	0.00	28.36
Malpaís	Mean				103.28	110.95	107.11
	SD				15.72	16.36	11.53
	2.5%				74.26	80.13	84.80
	25.0%				92.09	100.00	99.30
	50.0%				102.60	110.50	106.92
	75.0%				113.50	121.20	114.60
	97.5%				136.30	145.40	130.25

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	140.84	7.97	101.21	53.51	6.87	62.08
	SD	22.82	2.95	10.91	7.57	2.94	5.37
	2.5%	98.65	3.26	81.16	39.52	2.67	52.07
	25.0%	125.00	5.80	93.70	48.22	4.50	58.32
	50.0%	139.40	7.67	100.80	53.07	6.55	61.86
	75.0%	155.50	9.82	108.20	58.54	8.62	65.64
	97.5%	188.60	14.70	124.00	69.14	13.72	73.02
Marfa	Mean			51.99	6.58	21.39	26.65
	SD			7.47	2.99	5.03	3.12
	2.5%			38.59	1.92	12.50	20.82
	25.0%			46.74	4.50	17.65	24.48
	50.0%			51.54	6.19	21.02	26.57
	75.0%			56.75	8.15	24.76	28.61
	97.5%			67.90	13.85	31.85	33.16
New Mexico Bootheel	Mean					14.98	14.98
	SD					2.82	2.82
	2.5%					9.97	9.97
	25.0%					12.95	12.95
	50.0%					14.85	14.85
	75.0%					16.78	16.78
	97.5%					20.94	20.94
Otero Mesa	Mean					14.61	14.61
	SD					5.62	5.62
	2.5%					5.70	5.70
	25.0%					10.37	10.37
	50.0%					14.22	14.22
	75.0%					18.12	18.12
	97.5%					26.73	26.73
Sonoita	Mean		21.16	26.40	25.95	34.12	26.91
	SD		9.96	7.47	7.30	6.01	3.98
	2.5%		7.04	14.60	13.89	23.05	19.96
	25.0%		12.91	21.23	20.56	29.93	24.01
	50.0%		19.50	25.54	25.39	34.00	26.59
	75.0%		27.61	30.42	30.71	38.06	29.69
	97.5%		44.15	44.24	41.52	46.37	35.09
Sulphur Springs	Mean					33.22	33.22
	SD					6.58	6.58
	2.5%					22.37	22.37
	25.0%					28.35	28.35
	50.0%					32.61	32.61
	75.0%					37.22	37.22
	97.5%					47.91	47.91
Valle Colombia	Mean	37.71	4.83	200.76	7.41	6.92	51.52
	SD	22.89	2.48	22.05	4.11	3.55	6.32
	2.5%	7.45	1.47	159.80	1.72	2.25	40.68
	25.0%	21.74	3.11	185.20	4.19	4.32	47.02
	50.0%	31.63	4.34	199.80	6.62	6.29	50.99
	75.0%	49.51	6.01	215.40	9.83	8.66	55.54
	97.5%	91.51	11.37	245.50	16.93	15.71	65.34
Valles Centrales	Mean	22.35	9.75	36.66	34.62	21.93	25.06
	SD	5.60	2.34	5.25	4.61	3.23	2.08
	2.5%	11.41	5.59	27.18	26.10	16.14	21.29
	25.0%	18.63	8.08	33.01	31.39	19.66	23.58
	50.0%	22.20	9.56	36.40	34.40	21.78	24.95
	75.0%	25.88	11.26	40.10	37.67	24.02	26.40
	97.5%	33.87	14.73	47.58	44.13	28.67	29.46

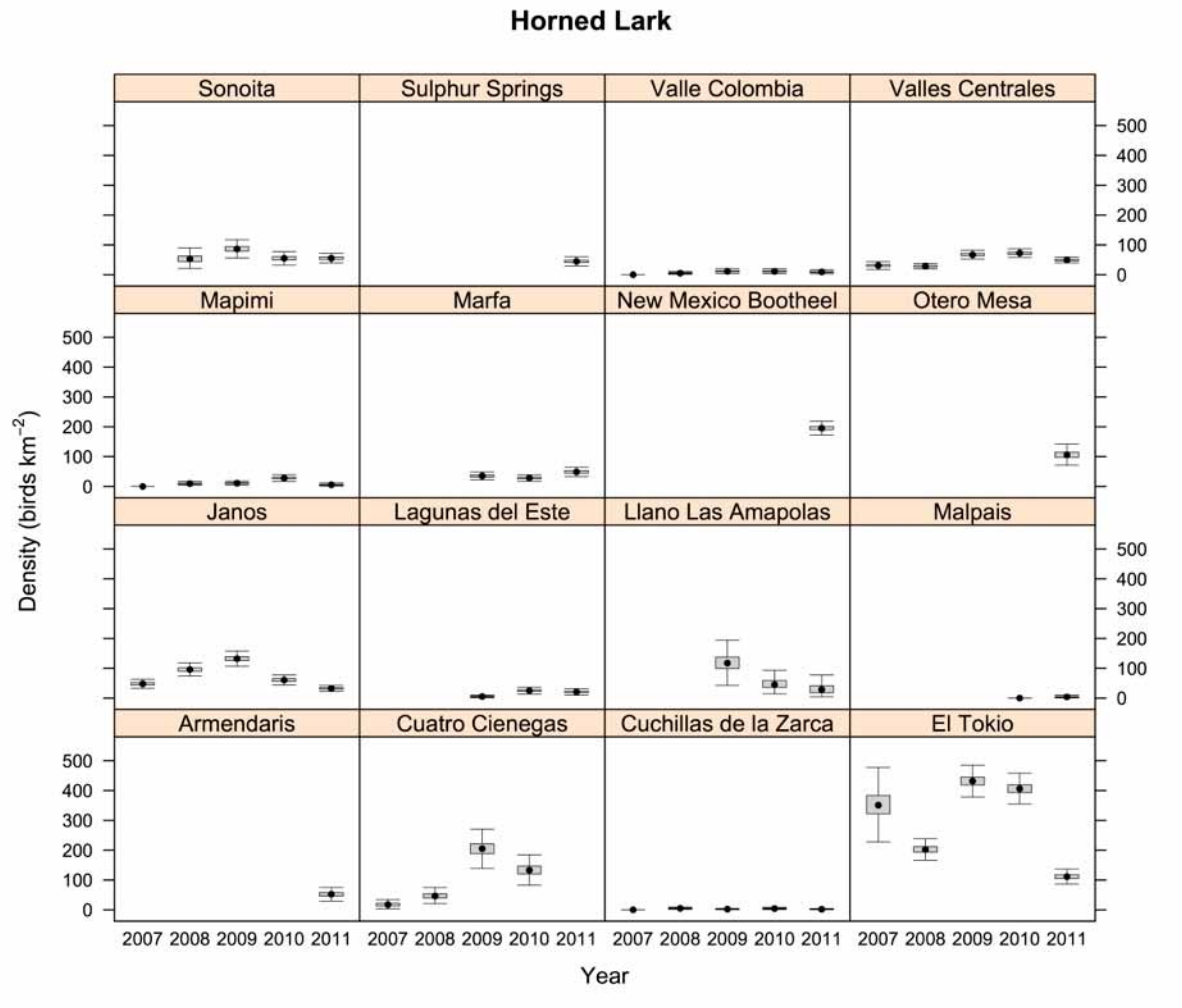

Grasshopper Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
50
100
150
200
250
300
2007 2008 2009 2010 2011
Year

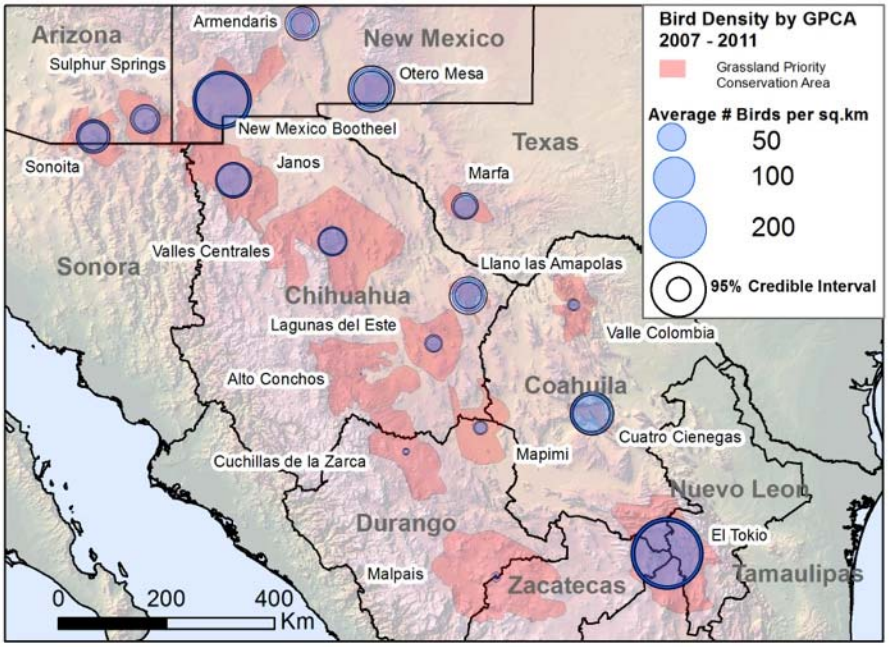

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
20
50
100
95% Credible Interval

Horned Lark (*n* = 4,058)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					52.35	52.35
	SD					8.80	8.80
	2.5%					35.32	35.32
	25.0%					46.38	46.38
	50.0%					52.10	52.10
	75.0%					57.98	57.98
	97.5%					70.80	70.80
Cuatro Ciénegas	Mean	18.01	47.01	205.57	134.08		101.16
	SD	6.11	10.67	24.51	18.89		8.44
	2.5%	7.84	28.04	160.40	99.69		85.28
	25.0%	13.34	39.58	188.60	120.90		95.46
	50.0%	17.61	46.26	204.90	133.00		100.96
	75.0%	21.88	53.83	221.50	146.50		106.55
	97.5%	31.28	69.94	256.10	173.90		118.64
Cuchillas de la Zarca	Mean	0.00	5.14	2.27	4.40	2.00	2.76
	SD	0.00	1.47	0.99	1.41	0.92	0.51
	2.5%	0.00	2.70	0.81	2.13	0.72	1.91
	25.0%	0.00	4.10	1.56	3.35	1.33	2.41
	50.0%	0.00	5.01	2.13	4.26	1.83	2.71
	75.0%	0.00	5.98	2.81	5.32	2.54	3.08
	97.5%	0.00	8.48	4.55	7.50	4.15	3.89
El Tokio	Mean	353.96	202.42	432.13	406.53	111.74	301.36
	SD	45.16	13.29	19.99	19.12	9.39	11.46
	2.5%	274.20	176.60	394.30	370.10	94.50	280.22
	25.0%	321.50	193.30	418.50	393.40	105.20	293.42
	50.0%	351.00	202.30	431.80	406.30	111.40	300.96
	75.0%	383.70	211.40	445.20	419.30	117.90	308.86
	97.5%	450.70	228.50	472.60	444.70	130.80	324.90
Janos	Mean	48.21	96.11	132.50	60.86	32.64	74.06
	SD	5.73	8.31	9.52	6.14	3.69	3.20
	2.5%	37.54	80.34	114.30	49.43	25.74	67.91
	25.0%	44.27	90.45	126.00	56.55	30.11	71.87
	50.0%	47.96	95.83	132.30	60.65	32.53	74.04
	75.0%	51.88	101.50	138.80	64.96	35.04	76.20
	97.5%	60.14	113.10	151.80	73.34	40.35	80.38
Lagunas del Este	Mean			5.47	25.22	20.74	17.14
	SD			1.84	4.22	3.91	2.07
	2.5%			2.18	17.92	13.29	13.25
	25.0%			4.20	22.20	18.05	15.70
	50.0%			5.36	24.90	20.63	17.06
	75.0%			6.63	27.84	23.43	18.50
	97.5%			9.49	34.59	28.28	21.38
Llano Las Amapolas	Mean			119.86	49.17	31.24	66.75
	SD			28.62	18.24	16.22	12.89
	2.5%			70.93	23.20	9.44	43.97
	25.0%			99.44	35.92	17.90	57.60
	50.0%			117.40	45.28	28.55	66.09
	75.0%			137.50	59.03	41.65	75.02
	97.5%			180.90	93.17	67.99	92.95
Malpaís	Mean				0.00	4.38	2.19
	SD				0.00	2.70	1.35
	2.5%				0.00	0.93	0.46
	25.0%				0.00	2.35	1.17
	50.0%				0.00	3.92	1.96
	75.0%				0.00	5.58	2.79
	97.5%				0.00	11.04	5.52

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	9.74	11.04	28.32	5.65	10.95
	SD	0.00	2.55	2.56	4.34	2.33	1.23
	2.5%	0.00	5.68	6.59	20.56	2.22	8.68
	25.0%	0.00	7.85	9.19	25.34	3.84	10.10
	50.0%	0.00	9.48	10.85	27.90	5.31	10.90
	75.0%	0.00	11.33	12.70	30.92	7.15	11.75
	97.5%	0.00	15.49	16.39	37.94	10.99	13.54
Marfa	Mean			35.41	28.23	48.93	37.52
	SD			4.88	4.03	5.73	2.94
	2.5%			26.37	20.58	38.34	32.04
	25.0%			31.98	25.42	44.91	35.45
	50.0%			35.12	28.21	48.72	37.45
	75.0%			38.56	30.82	52.70	39.49
	97.5%			45.59	36.54	60.56	43.49
New Mexico Bootheel	Mean					195.41	195.41
	SD					8.57	8.57
	2.5%					178.80	178.80
	25.0%					189.60	189.60
	50.0%					195.30	195.30
	75.0%					201.10	201.10
	97.5%					212.50	212.50
Otero Mesa	Mean					106.79	106.79
	SD					13.08	13.08
	2.5%					83.31	83.31
	25.0%					97.61	97.61
	50.0%					105.90	105.90
	75.0%					115.30	115.30
	97.5%					134.10	134.10
Sonoita	Mean		53.81	87.25	55.19	55.62	62.96
	SD		13.61	11.08	8.25	5.95	5.36
	2.5%		29.54	67.77	39.93	44.97	53.00
	25.0%		44.06	79.41	49.47	51.42	59.29
	50.0%		53.13	86.44	54.97	55.30	62.80
	75.0%		62.35	94.48	60.69	59.35	66.47
	97.5%		82.68	110.80	71.81	68.38	73.86
Sulphur Springs	Mean					44.95	44.95
	SD					5.85	5.85
	2.5%					34.13	34.13
	25.0%					40.89	40.89
	50.0%					44.77	44.77
	75.0%					48.71	48.71
	97.5%					57.31	57.31
Valle Colombia	Mean	0.00	5.37	11.92	11.57	9.68	7.71
	SD	0.00	2.20	3.54	3.28	3.22	1.38
	2.5%	0.00	1.68	6.50	6.48	4.61	5.24
	25.0%	0.00	3.90	9.32	9.17	7.46	6.70
	50.0%	0.00	5.15	11.53	11.16	9.30	7.63
	75.0%	0.00	6.62	13.89	13.50	11.34	8.62
	97.5%	0.00	10.34	20.31	19.44	17.46	10.54
Valles Centrales	Mean	31.24	28.84	67.20	72.69	49.71	49.94
	SD	5.03	3.54	5.54	5.38	3.73	2.15
	2.5%	22.47	22.43	56.83	62.37	42.72	45.81
	25.0%	27.69	26.41	63.42	69.02	47.16	48.46
	50.0%	30.87	28.64	66.96	72.65	49.59	49.91
	75.0%	34.38	31.11	70.89	76.30	52.11	51.38
	97.5%	42.09	36.38	78.30	83.38	57.54	54.23

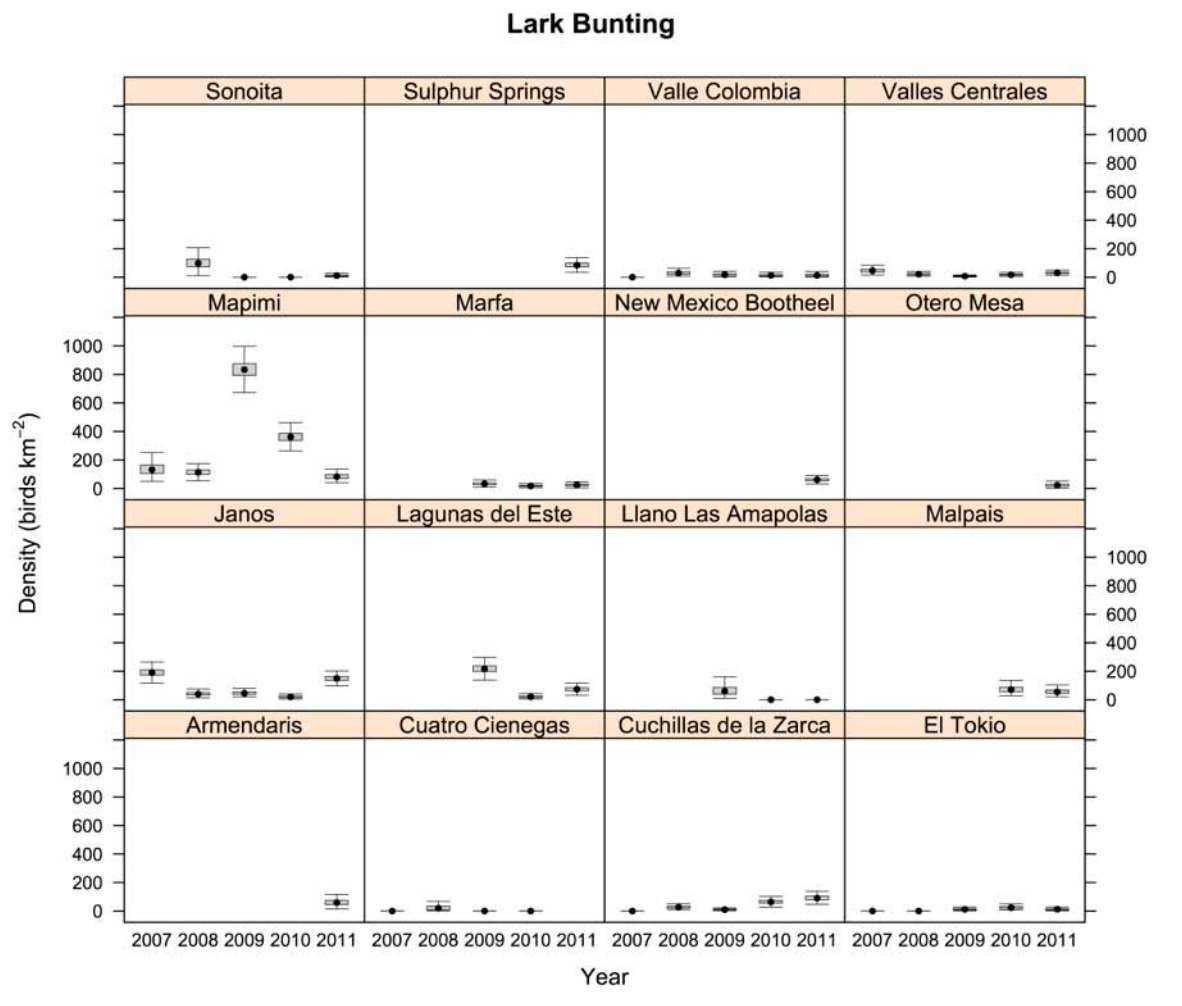

Horned Lark
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
100
200
300
400
500
2007 2008 2009 2010 2011
Year

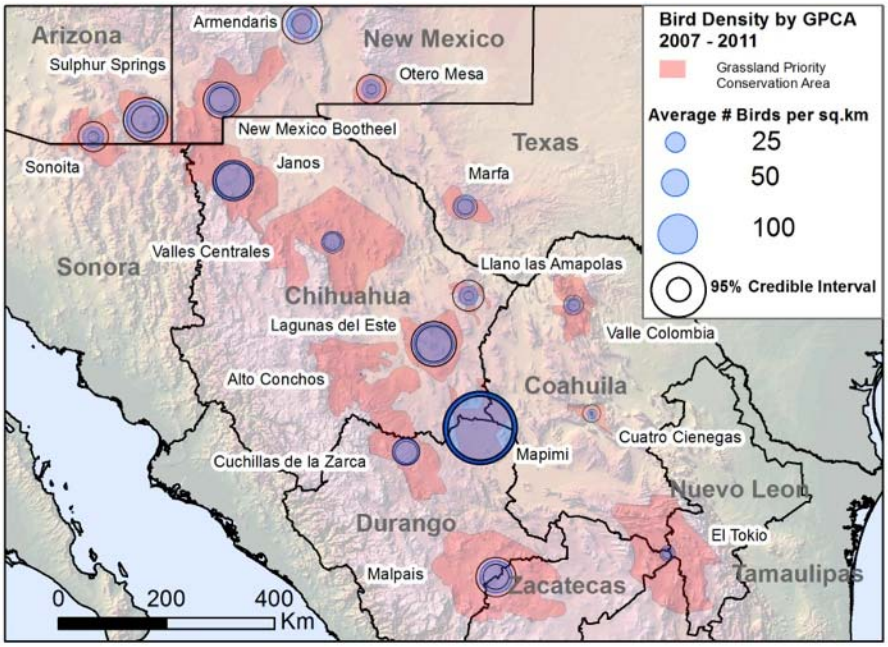

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
50
100
200
95% Credible Interval
0
200
400
Km

Lark Bunting (*n* = 856)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					61.41	61.41
	SD					20.13	20.13
	2.5%					26.27	26.27
	25.0%					46.86	46.86
	50.0%					59.21	59.21
	75.0%					74.87	74.87
	97.5%					103.80	103.80
Cuatro Ciénegas	Mean	0.00	24.56	0.00	0.00		6.14
	SD	0.00	20.12	0.00	0.00		5.03
	2.5%	0.00	3.29	0.00	0.00		0.82
	25.0%	0.00	9.61	0.00	0.00		2.40
	50.0%	0.00	20.08	0.00	0.00		5.02
	75.0%	0.00	32.99	0.00	0.00		8.25
	97.5%	0.00	82.30	0.00	0.00		20.57
Cuchillas de la Zarca	Mean	0.00	27.66	10.64	65.72	91.67	39.14
	SD	0.00	9.02	4.99	13.89	16.97	4.79
	2.5%	0.00	13.60	4.00	42.08	62.25	30.20
	25.0%	0.00	20.90	6.85	55.87	79.08	35.77
	50.0%	0.00	26.62	9.56	64.49	90.90	38.98
	75.0%	0.00	32.77	13.46	74.31	103.00	42.32
	97.5%	0.00	48.61	22.68	96.51	127.10	48.97
El Tokio	Mean	0.00	0.00	12.74	25.62	12.69	10.21
	SD	0.00	0.00	6.25	9.79	6.19	2.88
	2.5%	0.00	0.00	4.11	11.65	2.82	5.78
	25.0%	0.00	0.00	7.97	18.41	8.15	8.14
	50.0%	0.00	0.00	11.61	23.62	12.50	9.78
	75.0%	0.00	0.00	16.16	31.12	16.33	11.84
	97.5%	0.00	0.00	26.98	48.01	26.81	16.98
Janos	Mean	191.42	41.76	46.73	21.03	150.45	90.28
	SD	27.46	12.15	11.98	7.18	19.22	8.02
	2.5%	141.60	20.85	26.91	8.99	116.00	75.21
	25.0%	172.30	33.06	37.87	15.83	137.00	84.70
	50.0%	190.10	40.13	45.23	20.78	149.40	90.02
	75.0%	209.50	49.98	54.53	25.53	163.10	95.58
	97.5%	249.30	68.11	71.82	35.85	190.40	106.64
Lagunas del Este	Mean			218.45	21.64	73.79	104.63
	SD			29.98	8.02	16.82	11.98
	2.5%			163.50	8.58	40.58	82.21
	25.0%			197.70	15.38	62.79	96.39
	50.0%			217.20	20.76	73.59	104.37
	75.0%			237.60	26.84	84.32	112.52
	97.5%			281.10	39.34	107.20	128.70
Llano Las Amapolas	Mean			70.44	0.00	0.00	23.48
	SD			45.65	0.00	0.00	15.22
	2.5%			17.34	0.00	0.00	5.78
	25.0%			38.71	0.00	0.00	12.90
	50.0%			59.96	0.00	0.00	19.99
	75.0%			87.42	0.00	0.00	29.14
	97.5%			191.20	0.00	0.00	63.73
Malpaís	Mean				74.43	57.78	66.11
	SD				23.68	18.44	15.15
	2.5%				40.21	28.18	39.83
	25.0%				56.20	44.53	55.41
	50.0%				70.71	55.15	65.05
	75.0%				88.15	68.35	75.28
	97.5%				130.80	99.00	100.19

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	137.62	114.91	835.35	362.69	84.28	306.97
	SD	42.75	22.03	60.20	37.14	18.66	18.68
	2.5%	70.80	76.42	723.20	294.70	51.85	272.24
	25.0%	105.70	99.36	794.00	337.00	70.49	294.22
	50.0%	131.60	113.70	833.20	360.70	82.95	306.44
	75.0%	164.70	129.20	875.30	386.60	96.68	319.10
	97.5%	235.00	160.50	956.20	441.00	123.90	345.06
Marfa	Mean			33.67	18.13	25.53	25.78
	SD			10.59	5.72	9.55	5.39
	2.5%			17.01	8.80	8.96	16.67
	25.0%			26.16	13.97	19.25	22.04
	50.0%			32.38	17.51	24.18	25.25
	75.0%			39.46	21.70	30.58	28.82
	97.5%			58.07	31.20	47.49	38.23
New Mexico Bootheel	Mean					61.51	61.51
	SD					11.31	11.31
	2.5%					40.19	40.19
	25.0%					53.70	53.70
	50.0%					61.16	61.16
	75.0%					68.73	68.73
	97.5%					85.34	85.34
Otero Mesa	Mean					24.10	24.10
	SD					12.64	12.64
	2.5%					5.62	5.62
	25.0%					15.66	15.66
	50.0%					21.67	21.67
	75.0%					29.82	29.82
	97.5%					56.32	56.32
Sonoita	Mean		103.11	0.00	0.00	11.62	28.68
	SD		46.59	0.00	0.00	6.19	12.03
	2.5%		23.52	0.00	0.00	3.14	7.31
	25.0%		73.97	0.00	0.00	6.57	21.29
	50.0%		97.5%6	0.00	0.00	10.43	27.25
	75.0%		126.80	0.00	0.00	15.71	34.55
	97.5%		216.40	0.00	0.00	25.34	58.28
Sulphur Springs	Mean					85.52	85.52
	SD					19.59	19.59
	2.5%					48.30	48.30
	25.0%					72.58	72.58
	50.0%					84.26	84.26
	75.0%					98.31	98.31
	97.5%					125.80	125.80
Valle Colombia	Mean	0.00	30.61	19.00	14.75	14.62	15.79
	SD	0.00	12.78	10.09	9.35	9.30	4.98
	2.5%	0.00	11.06	4.28	3.62	2.15	8.03
	25.0%	0.00	21.43	12.02	8.01	7.54	11.82
	50.0%	0.00	28.81	17.18	12.66	12.41	15.38
	75.0%	0.00	38.05	23.98	18.72	20.10	19.24
	97.5%	0.00	59.46	45.94	40.35	36.97	25.94
Valles Centrales	Mean	46.70	21.73	7.49	17.76	30.78	24.89
	SD	12.80	6.62	3.44	5.59	6.81	3.75
	2.5%	25.53	11.13	2.01	8.63	18.89	18.25
	25.0%	36.74	16.84	4.88	13.58	25.76	22.20
	50.0%	45.69	20.92	7.16	17.14	30.33	24.65
	75.0%	55.38	25.98	9.65	21.48	35.35	27.39
	97.5%	73.42	36.40	15.08	29.46	44.93	32.69

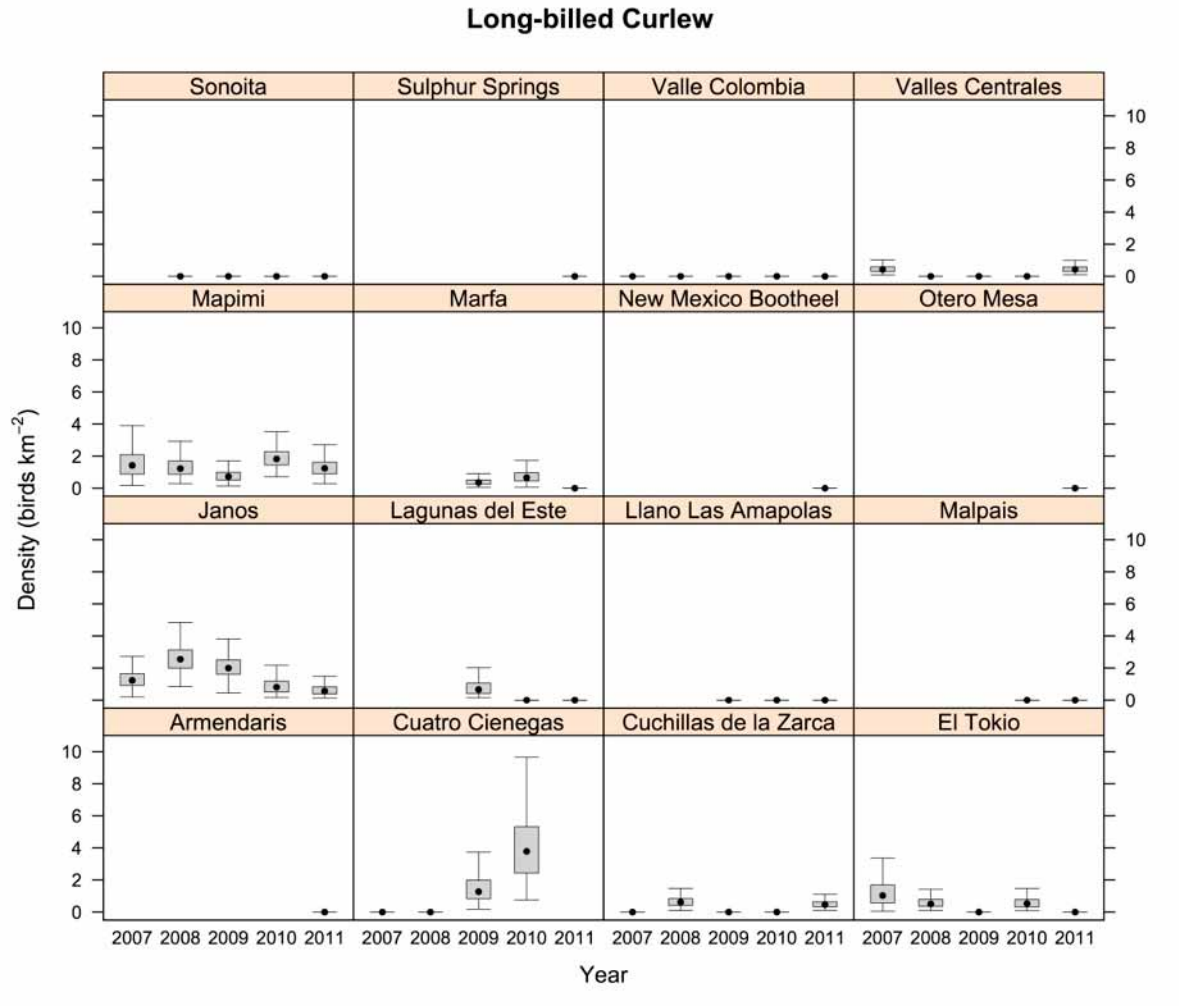

Lark Bunting
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
200
400
600
800
1000
2007 2008 2009 2010 2011
Year

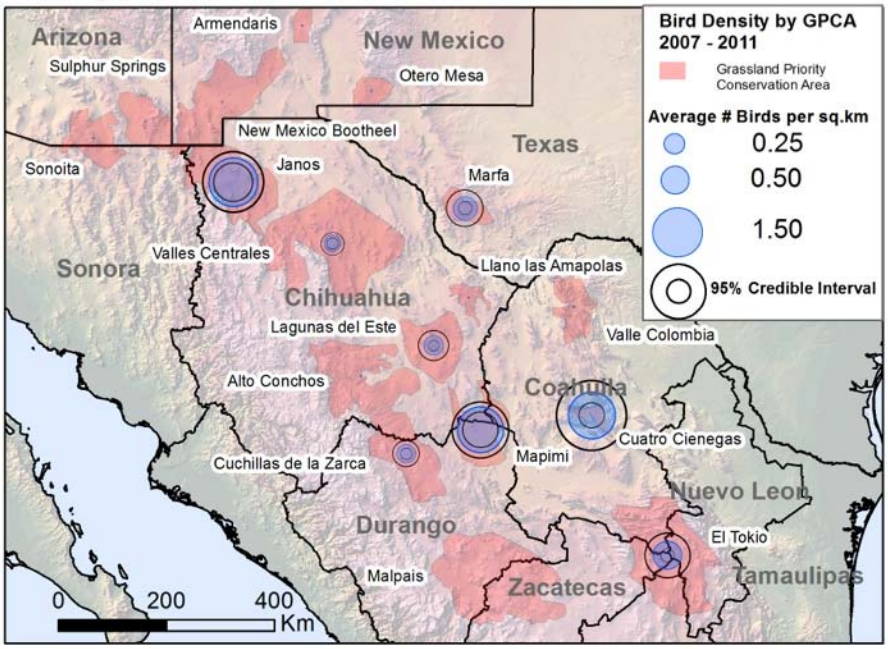

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
25
50
100
95% Credible Interval
0
200
400
Km

Long-billed Curlew (*n* = 68)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	1.59	4.17		1.44
	SD	0.00	0.00	1.10	2.38		0.73
	2.5%	0.00	0.00	0.42	1.08		0.42
	25.0%	0.00	0.00	0.82	2.43		0.92
	50.0%	0.00	0.00	1.27	3.78		1.34
	75.0%	0.00	0.00	1.99	5.32		1.80
	97.5%	0.00	0.00	4.68	9.90		3.15
Cuchillas de la Zarca	Mean	0.00	0.66	0.00	0.00	0.52	0.24
	SD	0.00	0.33	0.00	0.00	0.25	0.09
	2.5%	0.00	0.20	0.00	0.00	0.17	0.09
	25.0%	0.00	0.41	0.00	0.00	0.33	0.17
	50.0%	0.00	0.62	0.00	0.00	0.47	0.23
	75.0%	0.00	0.84	0.00	0.00	0.65	0.29
	97.5%	0.00	1.44	0.00	0.00	1.13	0.44
El Tokio	Mean	1.31	0.61	0.00	0.61	0.00	0.51
	SD	1.14	0.38	0.00	0.39	0.00	0.30
	2.5%	0.14	0.16	0.00	0.16	0.00	0.11
	25.0%	0.57	0.36	0.00	0.32	0.00	0.30
	50.0%	1.03	0.51	0.00	0.53	0.00	0.44
	75.0%	1.69	0.79	0.00	0.78	0.00	0.65
	97.5%	4.80	1.43	0.00	1.71	0.00	1.32
Janos	Mean	1.30	2.68	2.14	0.91	0.64	1.53
	SD	0.53	0.97	0.78	0.54	0.31	0.35
	2.5%	0.41	1.17	1.02	0.24	0.22	0.99
	25.0%	0.92	2.00	1.62	0.51	0.39	1.29
	50.0%	1.23	2.55	2.00	0.81	0.57	1.49
	75.0%	1.65	3.14	2.50	1.18	0.83	1.72
	97.5%	2.48	5.17	4.23	2.21	1.38	2.38
Lagunas del Este	Mean			0.78	0.00	0.00	0.26
	SD			0.45	0.00	0.00	0.15
	2.5%			0.23	0.00	0.00	0.08
	25.0%			0.42	0.00	0.00	0.14
	50.0%			0.66	0.00	0.00	0.22
	75.0%			1.06	0.00	0.00	0.35
	97.5%			1.79	0.00	0.00	0.60
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.00	0.00	0.00
	SD				0.00	0.00	0.00
	2.5%				0.00	0.00	0.00
	25.0%				0.00	0.00	0.00
	50.0%				0.00	0.00	0.00
	75.0%				0.00	0.00	0.00
	97.5%				0.00	0.00	0.00

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	1.58	1.32	0.78	1.92	1.29	1.38
	SD	0.92	0.58	0.34	0.63	0.52	0.32
	2.5%	0.38	0.48	0.27	1.02	0.43	0.82
	25.0%	0.88	0.88	0.52	1.45	0.89	1.14
	50.0%	1.42	1.22	0.73	1.82	1.24	1.36
	75.0%	2.09	1.70	0.99	2.28	1.62	1.60
	97.5%	3.78	2.62	1.57	3.43	2.44	2.03
Marfa	Mean			0.40	0.76	0.00	0.39
	SD			0.20	0.44	0.00	0.19
	2.5%			0.11	0.18	0.00	0.11
	25.0%			0.25	0.45	0.00	0.25
	50.0%			0.35	0.66	0.00	0.35
	75.0%			0.51	0.97	0.00	0.49
	97.5%			0.89	1.92	0.00	0.86
New Mexico Bootheel	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	0.00	0.00	0.00	0.00
	SD		0.00	0.00	0.00	0.00	0.00
	2.5%		0.00	0.00	0.00	0.00	0.00
	25.0%		0.00	0.00	0.00	0.00	0.00
	50.0%		0.00	0.00	0.00	0.00	0.00
	75.0%		0.00	0.00	0.00	0.00	0.00
	97.5%		0.00	0.00	0.00	0.00	0.00
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Valles Centrales	Mean	0.47	0.00	0.00	0.00	0.47	0.19
	SD	0.23	0.00	0.00	0.00	0.21	0.07
	2.5%	0.13	0.00	0.00	0.00	0.17	0.08
	25.0%	0.31	0.00	0.00	0.00	0.31	0.14
	50.0%	0.43	0.00	0.00	0.00	0.43	0.18
	75.0%	0.60	0.00	0.00	0.00	0.59	0.23
	97.5%	1.01	0.00	0.00	0.00	0.99	0.35

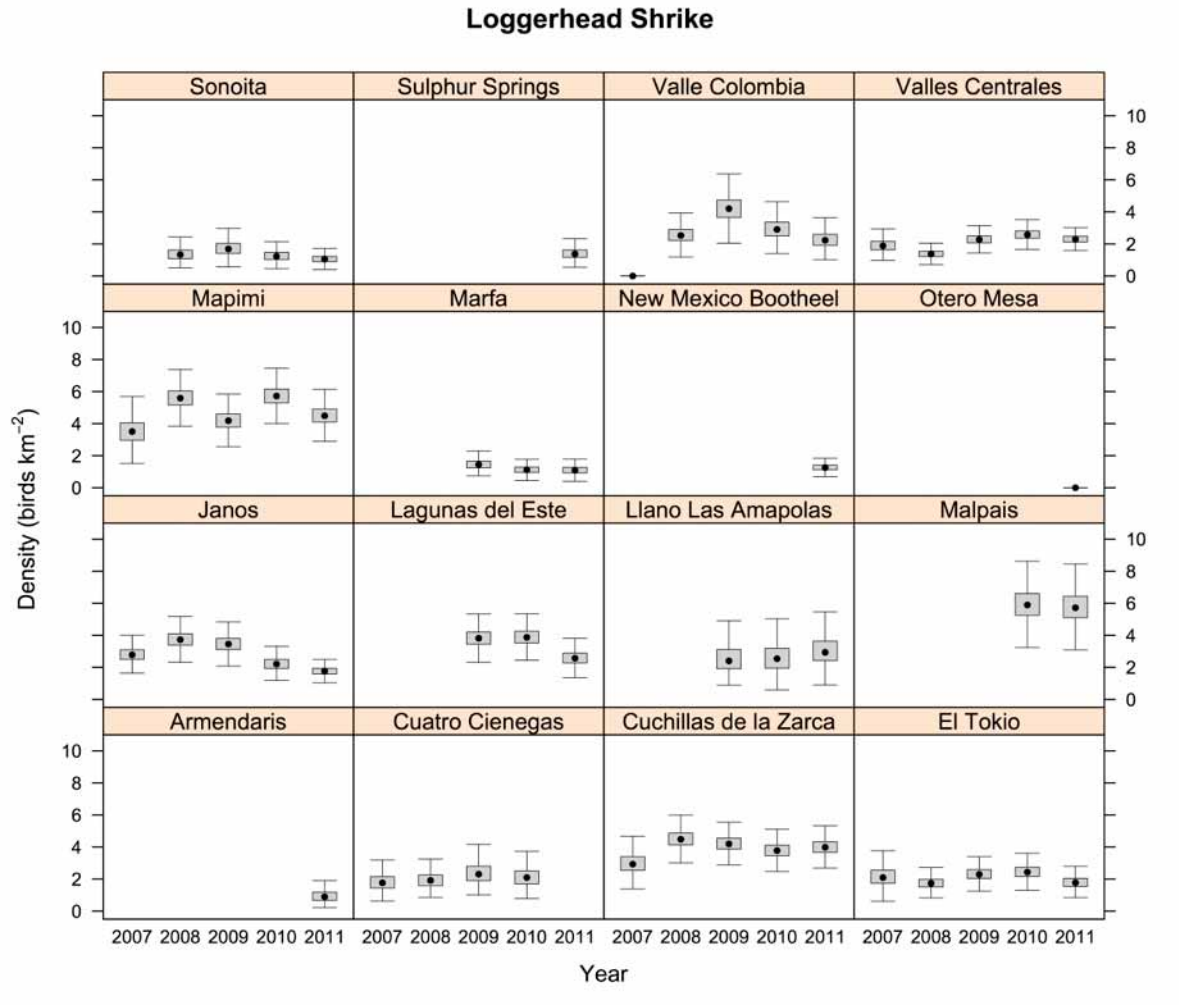

Long-billed Curlew
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
2
4
6
8
10
2007 2008 2009 2010 2011
Year

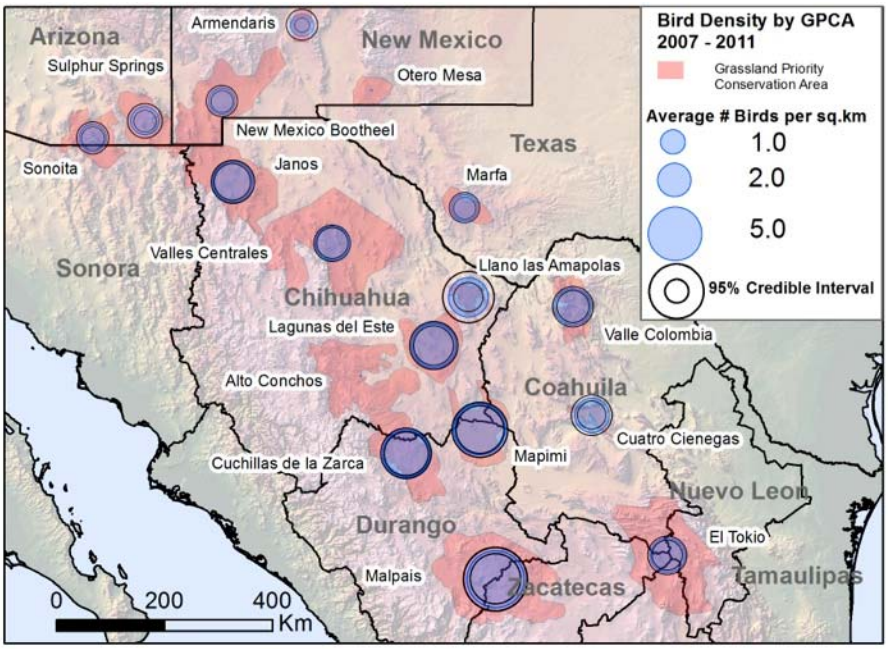

Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.25
0.50
1.50
95% Credible Interval
Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km

Loggerhead Shrike (*n* = 1,340)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.95	0.95
	SD					0.37	0.37
	2.5%					0.37	0.37
	25.0%					0.68	0.68
	50.0%					0.89	0.89
	75.0%					1.17	1.17
	97.5%					1.80	1.80
Cuatro Ciénegas	Mean	1.83	1.97	2.42	2.15		2.09
	SD	0.54	0.52	0.72	0.61		0.41
	2.5%	0.97	1.14	1.31	1.19		1.41
	25.0%	1.44	1.59	1.90	1.70		1.80
	50.0%	1.77	1.92	2.31	2.10		2.07
	75.0%	2.15	2.26	2.81	2.51		2.35
	97.5%	3.02	3.18	4.11	3.57		2.98
Cuchillas de la Zarca	Mean	3.00	4.51	4.22	3.80	4.01	3.91
	SD	0.65	0.54	0.49	0.48	0.48	0.28
	2.5%	1.89	3.54	3.35	2.90	3.14	3.39
	25.0%	2.54	4.13	3.88	3.46	3.67	3.72
	50.0%	2.93	4.48	4.20	3.78	3.98	3.90
	75.0%	3.40	4.88	4.55	4.12	4.33	4.09
	97.5%	4.45	5.65	5.24	4.80	5.01	4.47
El Tokio	Mean	2.18	1.76	2.34	2.47	1.81	2.11
	SD	0.64	0.35	0.42	0.43	0.37	0.25
	2.5%	1.13	1.15	1.60	1.71	1.16	1.65
	25.0%	1.74	1.51	2.05	2.17	1.54	1.94
	50.0%	2.10	1.74	2.30	2.44	1.78	2.10
	75.0%	2.55	1.99	2.59	2.74	2.05	2.27
	97.5%	3.65	2.52	3.27	3.39	2.62	2.64
Janos	Mean	2.81	3.76	3.47	2.23	1.77	2.81
	SD	0.45	0.54	0.49	0.40	0.28	0.22
	2.5%	2.02	2.81	2.59	1.56	1.26	2.40
	25.0%	2.50	3.39	3.11	1.94	1.58	2.65
	50.0%	2.78	3.73	3.46	2.21	1.77	2.80
	75.0%	3.10	4.10	3.80	2.49	1.95	2.96
	97.5%	3.77	4.92	4.49	3.09	2.35	3.26
Lagunas del Este	Mean			3.85	3.91	2.60	3.46
	SD			0.58	0.59	0.45	0.35
	2.5%			2.81	2.86	1.85	2.82
	25.0%			3.44	3.53	2.27	3.21
	50.0%			3.82	3.88	2.57	3.44
	75.0%			4.20	4.25	2.89	3.67
	97.5%			5.12	5.21	3.57	4.20
Llano Las Amapolas	Mean			2.60	2.62	3.18	2.80
	SD			0.98	0.90	1.23	0.76
	2.5%			1.25	1.08	1.56	1.57
	25.0%			1.92	1.96	2.42	2.27
	50.0%			2.41	2.54	2.94	2.71
	75.0%			3.12	3.19	3.64	3.20
	97.5%			5.10	4.63	6.39	4.67
Malpaís	Mean				5.94	5.79	5.87
	SD				0.99	0.97	0.75
	2.5%				4.13	4.08	4.50
	25.0%				5.25	5.10	5.33
	50.0%				5.89	5.72	5.84
	75.0%				6.60	6.44	6.36
	97.5%				7.99	7.79	7.40

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	3.56	5.63	4.21	5.74	4.52	4.73
	SD	0.81	0.68	0.59	0.66	0.59	0.35
	2.5%	2.22	4.40	3.12	4.51	3.46	4.07
	25.0%	2.96	5.16	3.78	5.30	4.11	4.49
	50.0%	3.50	5.59	4.18	5.72	4.49	4.73
	75.0%	4.05	6.05	4.61	6.16	4.92	4.97
	97.5%	5.38	7.10	5.42	7.12	5.76	5.42
Marfa	Mean			1.47	1.13	1.11	1.24
	SD			0.31	0.25	0.27	0.20
	2.5%			0.97	0.68	0.65	0.89
	25.0%			1.24	0.95	0.93	1.11
	50.0%			1.45	1.12	1.09	1.22
	75.0%			1.66	1.28	1.27	1.36
	97.5%			2.18	1.68	1.72	1.66
New Mexico Bootheel	Mean					1.27	1.27
	SD					0.22	0.22
	2.5%					0.88	0.88
	25.0%					1.12	1.12
	50.0%					1.26	1.26
	75.0%					1.41	1.41
	97.5%					1.74	1.74
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		1.38	1.75	1.28	1.07	1.37
	SD		0.39	0.48	0.34	0.25	0.26
	2.5%		0.71	0.97	0.72	0.62	0.92
	25.0%		1.09	1.40	1.03	0.90	1.18
	50.0%		1.34	1.69	1.23	1.06	1.36
	75.0%		1.63	2.04	1.47	1.23	1.54
	97.5%		2.23	2.80	2.09	1.64	1.90
Sulphur Springs	Mean					1.42	1.42
	SD					0.35	0.35
	2.5%					0.83	0.83
	25.0%					1.17	1.17
	50.0%					1.38	1.38
	75.0%					1.63	1.63
	97.5%					2.19	2.19
Valle Colombia	Mean	0.00	2.58	4.25	2.96	2.28	2.41
	SD	0.00	0.53	0.81	0.64	0.53	0.30
	2.5%	0.00	1.68	2.84	1.85	1.38	1.88
	25.0%	0.00	2.21	3.66	2.50	1.91	2.20
	50.0%	0.00	2.53	4.20	2.91	2.23	2.40
	75.0%	0.00	2.90	4.75	3.36	2.60	2.61
	97.5%	0.00	3.76	5.99	4.36	3.47	3.02
Valles Centrales	Mean	1.90	1.39	2.29	2.60	2.31	2.10
	SD	0.37	0.24	0.32	0.35	0.27	0.16
	2.5%	1.24	0.94	1.70	1.98	1.83	1.81
	25.0%	1.63	1.22	2.08	2.36	2.12	1.99
	50.0%	1.89	1.38	2.28	2.58	2.29	2.09
	75.0%	2.15	1.55	2.50	2.82	2.48	2.20
	97.5%	2.67	1.88	2.97	3.34	2.89	2.43

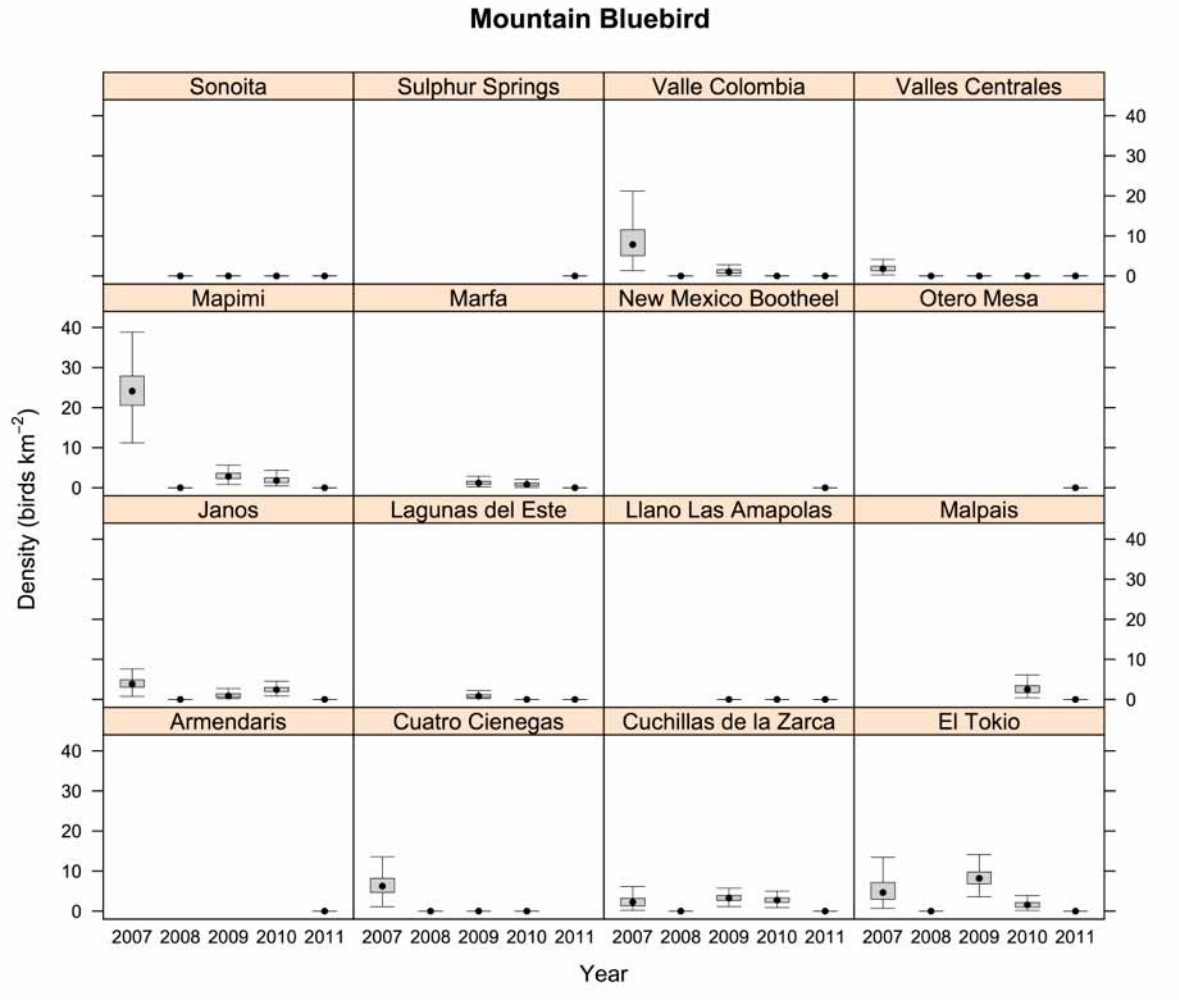

Loggerhead Shrike
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0 2 4 6 8 10
2007 2008 2009 2010 2011
Year

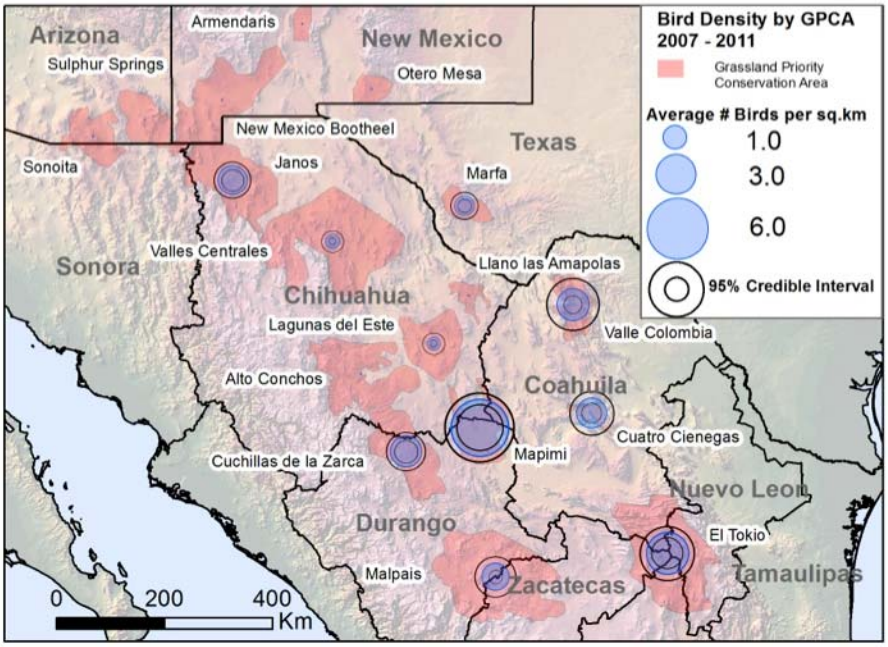

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
0 200 400 Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
1.0
2.0
5.0
95% Credible Interval

Mountain Bluebird (*n* = 115)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	6.72	0.00	0.00	0.00		1.68
	SD	2.92	0.00	0.00	0.00		0.73
	2.5%	2.72	0.00	0.00	0.00		0.68
	25.0%	4.66	0.00	0.00	0.00		1.17
	50.0%	6.24	0.00	0.00	0.00		1.56
	75.0%	8.21	0.00	0.00	0.00		2.05
	97.5%	14.06	0.00	0.00	0.00		3.52
Cuchillas de la Zarca	Mean	2.44	0.00	3.37	2.80	0.00	1.72
	SD	1.48	0.00	0.97	0.87	0.00	0.42
	2.5%	0.43	0.00	1.75	1.36	0.00	0.97
	25.0%	1.28	0.00	2.69	2.18	0.00	1.43
	50.0%	2.24	0.00	3.27	2.73	0.00	1.71
	75.0%	3.22	0.00	3.92	3.31	0.00	1.99
	97.5%	5.96	0.00	5.67	4.80	0.00	2.64
El Tokio	Mean	5.48	0.00	8.43	1.71	0.00	3.12
	SD	3.27	0.00	2.17	1.04	0.00	0.90
	2.5%	1.48	0.00	4.89	0.32	0.00	1.73
	25.0%	2.97	0.00	6.84	0.97	0.00	2.49
	50.0%	4.64	0.00	8.19	1.56	0.00	3.00
	75.0%	7.14	0.00	9.74	2.14	0.00	3.58
	97.5%	13.90	0.00	13.22	4.47	0.00	5.29
Janos	Mean	4.06	0.00	1.13	2.57	0.00	1.55
	SD	1.39	0.00	0.77	0.90	0.00	0.39
	2.5%	1.86	0.00	0.30	1.23	0.00	0.87
	25.0%	3.06	0.00	0.60	1.95	0.00	1.29
	50.0%	3.86	0.00	0.86	2.43	0.00	1.52
	75.0%	4.88	0.00	1.44	3.00	0.00	1.78
	97.5%	7.41	0.00	3.30	4.75	0.00	2.40
Lagunas del Este	Mean			0.97	0.00	0.00	0.32
	SD			0.57	0.00	0.00	0.19
	2.5%			0.32	0.00	0.00	0.11
	25.0%			0.56	0.00	0.00	0.19
	50.0%			0.83	0.00	0.00	0.28
	75.0%			1.22	0.00	0.00	0.41
	97.5%			2.50	0.00	0.00	0.83
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				2.72	0.00	1.36
	SD				1.41	0.00	0.70
	2.5%				0.69	0.00	0.35
	25.0%				1.67	0.00	0.84
	50.0%				2.48	0.00	1.24
	75.0%				3.45	0.00	1.72
	97.5%				6.06	0.00	3.03

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	24.51	0.00	2.98	1.93	0.00	5.88
	SD	5.65	0.00	1.01	0.86	0.00	1.21
	2.5%	14.94	0.00	1.40	0.68	0.00	3.85
	25.0%	20.57	0.00	2.25	1.26	0.00	5.02
	50.0%	24.10	0.00	2.83	1.79	0.00	5.78
	75.0%	27.88	0.00	3.60	2.48	0.00	6.60
	97.5%	37.09	0.00	5.20	3.85	0.00	8.55
Marfa	Mean			1.29	0.89	0.00	0.73
	SD			0.63	0.44	0.00	0.25
	2.5%			0.36	0.19	0.00	0.32
	25.0%			0.82	0.56	0.00	0.54
	50.0%			1.19	0.83	0.00	0.70
	75.0%			1.63	1.17	0.00	0.88
	97.5%			2.81	1.89	0.00	1.29
New Mexico Bootheel	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	0.00	0.00	0.00	0.00
	SD		0.00	0.00	0.00	0.00	0.00
	2.5%		0.00	0.00	0.00	0.00	0.00
	25.0%		0.00	0.00	0.00	0.00	0.00
	50.0%		0.00	0.00	0.00	0.00	0.00
	75.0%		0.00	0.00	0.00	0.00	0.00
	97.5%		0.00	0.00	0.00	0.00	0.00
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	8.84	0.00	1.26	0.00	0.00	2.02
	SD	5.09	0.00	0.94	0.00	0.00	1.07
	2.5%	2.25	0.00	0.22	0.00	0.00	0.59
	25.0%	5.10	0.00	0.67	0.00	0.00	1.25
	50.0%	7.85	0.00	1.05	0.00	0.00	1.83
	75.0%	11.54	0.00	1.53	0.00	0.00	2.55
	97.5%	22.54	0.00	3.69	0.00	0.00	4.83
Valles Centrales	Mean	1.97	0.00	0.00	0.00	0.00	0.39
	SD	0.97	0.00	0.00	0.00	0.00	0.19
	2.5%	0.52	0.00	0.00	0.00	0.00	0.10
	25.0%	1.30	0.00	0.00	0.00	0.00	0.26
	50.0%	1.83	0.00	0.00	0.00	0.00	0.37
	75.0%	2.44	0.00	0.00	0.00	0.00	0.49
	97.5%	4.22	0.00	0.00	0.00	0.00	0.84

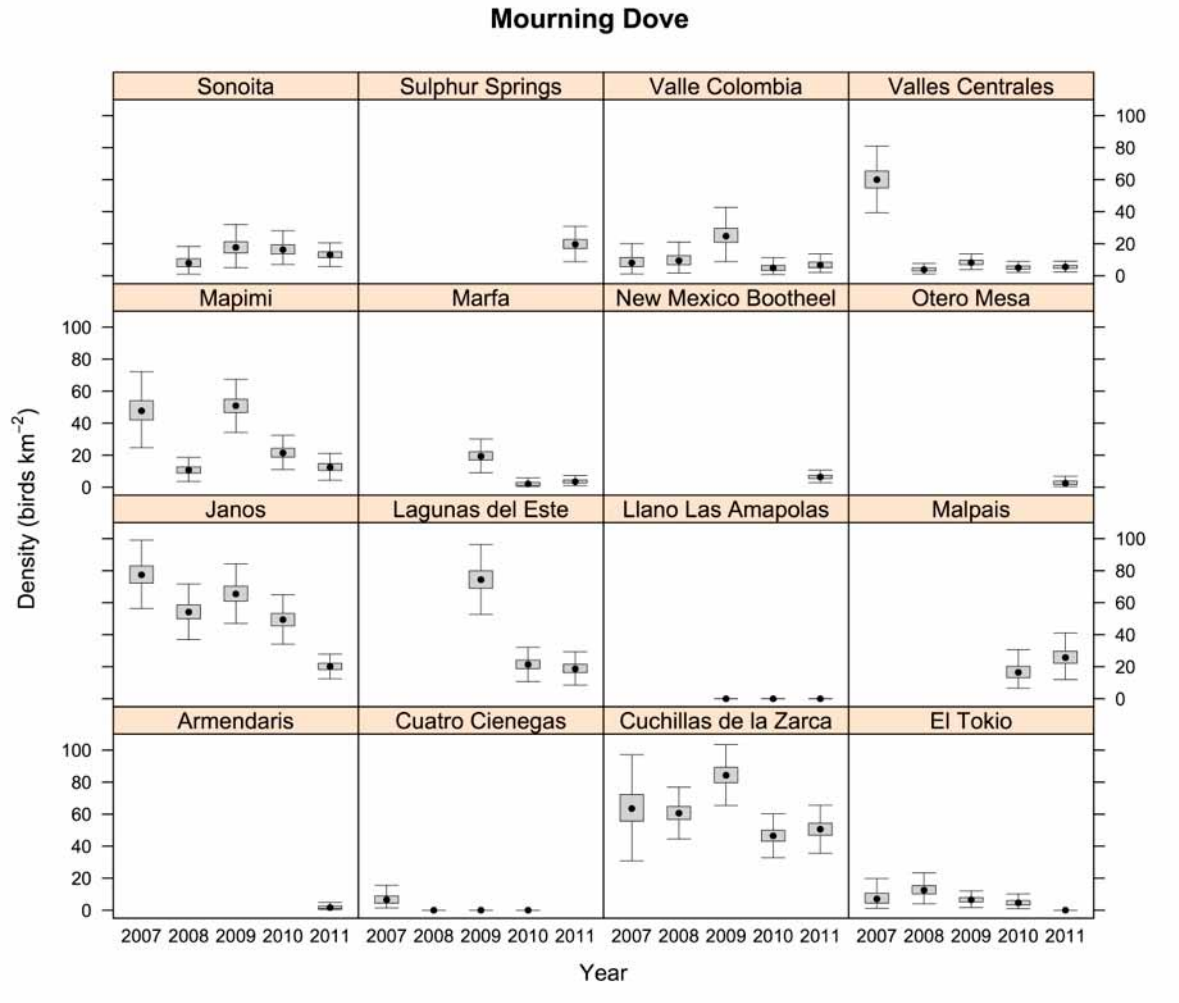

Mountain Bluebird
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
10
20
30
40
2007 2008 2009 2010 2011
Year

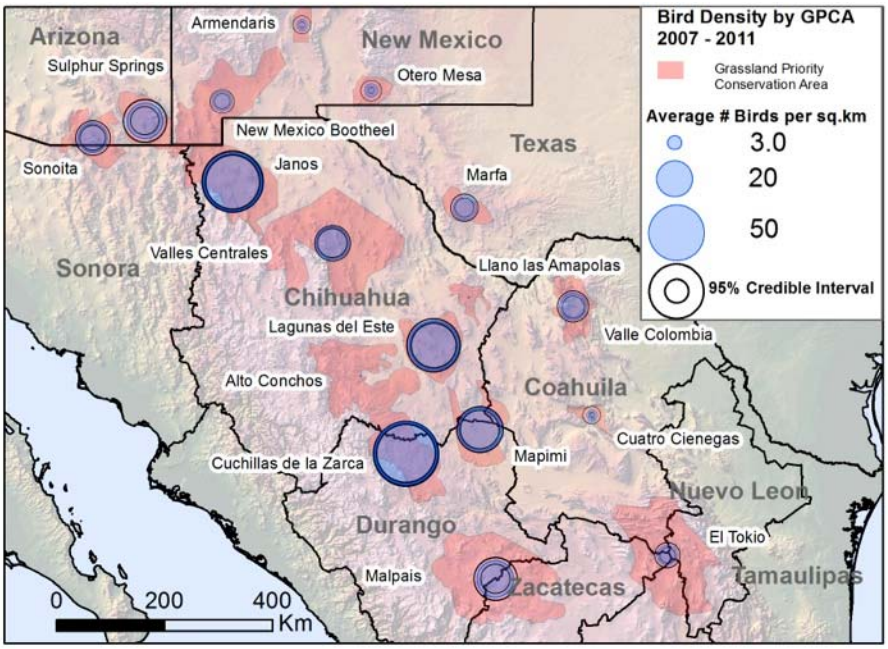

Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
1.0
3.0
6.0
95% Credible Interval
Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Tamaulipas
Durango
Zacatecas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km

Mourning Dove (*n* = 1,424)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					1.99	1.99
	SD					1.27	1.27
	2.5%					0.54	0.54
	25.0%					1.06	1.06
	50.0%					1.65	1.65
	75.0%					2.59	2.59
	97.5%					5.41	5.41
Cuatro Ciénegas	Mean	7.28	0.00	0.00	0.00		1.82
	SD	4.18	0.00	0.00	0.00		1.05
	2.5%	2.00	0.00	0.00	0.00		0.50
	25.0%	4.44	0.00	0.00	0.00		1.11
	50.0%	6.53	0.00	0.00	0.00		1.63
	75.0%	8.89	0.00	0.00	0.00		2.22
	97.5%	19.89	0.00	0.00	0.00		4.97
Cuchillas de la Zarca	Mean	64.48	60.79	84.58	46.60	50.66	61.42
	SD	12.26	6.14	7.09	5.11	5.60	3.52
	2.5%	43.53	49.19	71.43	36.91	39.82	54.95
	25.0%	55.68	56.65	79.71	43.06	46.83	59.00
	50.0%	63.49	60.60	84.27	46.45	50.59	61.30
	75.0%	72.26	64.72	89.25	49.93	54.36	63.74
	97.5%	91.29	73.65	99.04	57.11	62.06	68.72
El Tokio	Mean	8.31	13.00	6.65	4.75	0.00	6.54
	SD	5.18	3.95	2.14	1.92	0.00	1.54
	2.5%	2.06	6.52	2.52	1.61	0.00	4.22
	25.0%	4.51	10.11	5.19	3.24	0.00	5.48
	50.0%	7.08	12.53	6.51	4.65	0.00	6.31
	75.0%	10.61	15.39	7.96	6.04	0.00	7.32
	97.5%	22.49	21.96	11.37	8.87	0.00	10.53
Janos	Mean	77.83	54.36	65.77	49.51	20.32	53.56
	SD	7.92	6.53	6.91	5.78	3.11	2.93
	2.5%	63.64	42.22	53.11	38.59	14.81	47.94
	25.0%	72.23	49.93	60.96	45.58	18.23	51.57
	50.0%	77.38	54.12	65.44	49.39	20.14	53.50
	75.0%	82.96	58.59	70.30	53.29	22.12	55.48
	97.5%	94.31	67.84	80.27	61.41	27.26	59.48
Lagunas del Este	Mean			74.67	21.61	18.94	38.41
	SD			8.09	4.06	3.97	3.40
	2.5%			59.90	14.21	11.63	32.13
	25.0%			69.01	18.84	16.28	35.98
	50.0%			74.36	21.39	18.69	38.31
	75.0%			79.96	24.16	21.49	40.69
	97.5%			91.35	30.10	27.33	45.28
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				17.02	26.19	21.61
	SD				4.99	5.76	4.09
	2.5%				9.13	16.26	14.27
	25.0%				13.21	22.10	18.71
	50.0%				16.47	25.73	21.41
	75.0%				20.23	29.70	24.16
	97.5%				27.82	38.89	30.36

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	48.37	10.87	50.96	21.80	12.79	28.96
	SD	9.36	2.93	6.11	4.12	3.06	2.66
	2.5%	31.69	5.66	39.48	14.76	7.60	24.04
	25.0%	41.99	8.81	46.67	18.92	10.55	27.12
	50.0%	47.70	10.68	50.91	21.44	12.48	28.86
	75.0%	54.04	12.73	54.97	24.30	14.81	30.66
	97.5%	68.36	17.15	63.21	31.02	19.39	34.43
Marfa	Mean			19.74	2.31	3.76	8.60
	SD			4.02	1.37	1.52	1.49
	2.5%			12.87	0.53	1.60	5.97
	25.0%			16.96	1.20	2.65	7.59
	50.0%			19.38	2.10	3.51	8.46
	75.0%			22.21	3.06	4.56	9.55
	97.5%			28.85	5.59	7.56	11.80
New Mexico Bootheel	Mean					6.52	6.52
	SD					1.50	1.50
	2.5%					3.94	3.94
	25.0%					5.42	5.42
	50.0%					6.39	6.39
	75.0%					7.52	7.52
	97.5%					9.73	9.73
Otero Mesa	Mean					2.91	2.91
	SD					1.60	1.60
	2.5%					0.74	0.74
	25.0%					1.78	1.78
	50.0%					2.56	2.56
	75.0%					3.81	3.81
	97.5%					7.04	7.04
Sonoita	Mean		8.44	17.93	16.78	13.31	14.12
	SD		4.23	5.28	4.48	2.95	2.35
	2.5%		1.55	8.73	9.50	8.09	9.81
	25.0%		5.62	14.15	13.58	11.31	12.50
	50.0%		7.94	17.71	16.28	13.10	13.97
	75.0%		10.66	21.30	19.41	15.03	15.60
	97.5%		18.15	28.90	27.05	20.04	19.11
Sulphur Springs	Mean					20.01	20.01
	SD					4.24	4.24
	2.5%					12.60	12.60
	25.0%					17.08	17.08
	50.0%					19.67	19.67
	75.0%					22.61	22.61
	97.5%					29.24	29.24
Valle Colombia	Mean	8.98	9.98	25.41	5.02	6.92	11.26
	SD	4.74	3.99	6.62	2.34	2.44	2.17
	2.5%	2.05	3.61	13.70	1.23	2.89	7.54
	25.0%	5.68	6.91	20.87	3.30	5.10	9.66
	50.0%	8.12	9.43	24.73	4.88	6.69	11.11
	75.0%	11.46	12.61	29.62	6.49	8.51	12.70
	97.5%	21.03	18.65	39.47	10.03	12.27	15.82
Valles Centrales	Mean	60.35	4.07	8.38	5.21	5.67	16.74
	SD	7.65	1.37	1.97	1.43	1.37	1.68
	2.5%	46.75	2.14	4.98	2.96	3.49	13.66
	25.0%	54.88	3.03	6.97	4.15	4.67	15.55
	50.0%	59.99	3.84	8.18	5.01	5.51	16.65
	75.0%	65.33	4.90	9.64	6.07	6.48	17.82
	97.5%	76.41	7.36	12.67	8.47	9.00	20.32

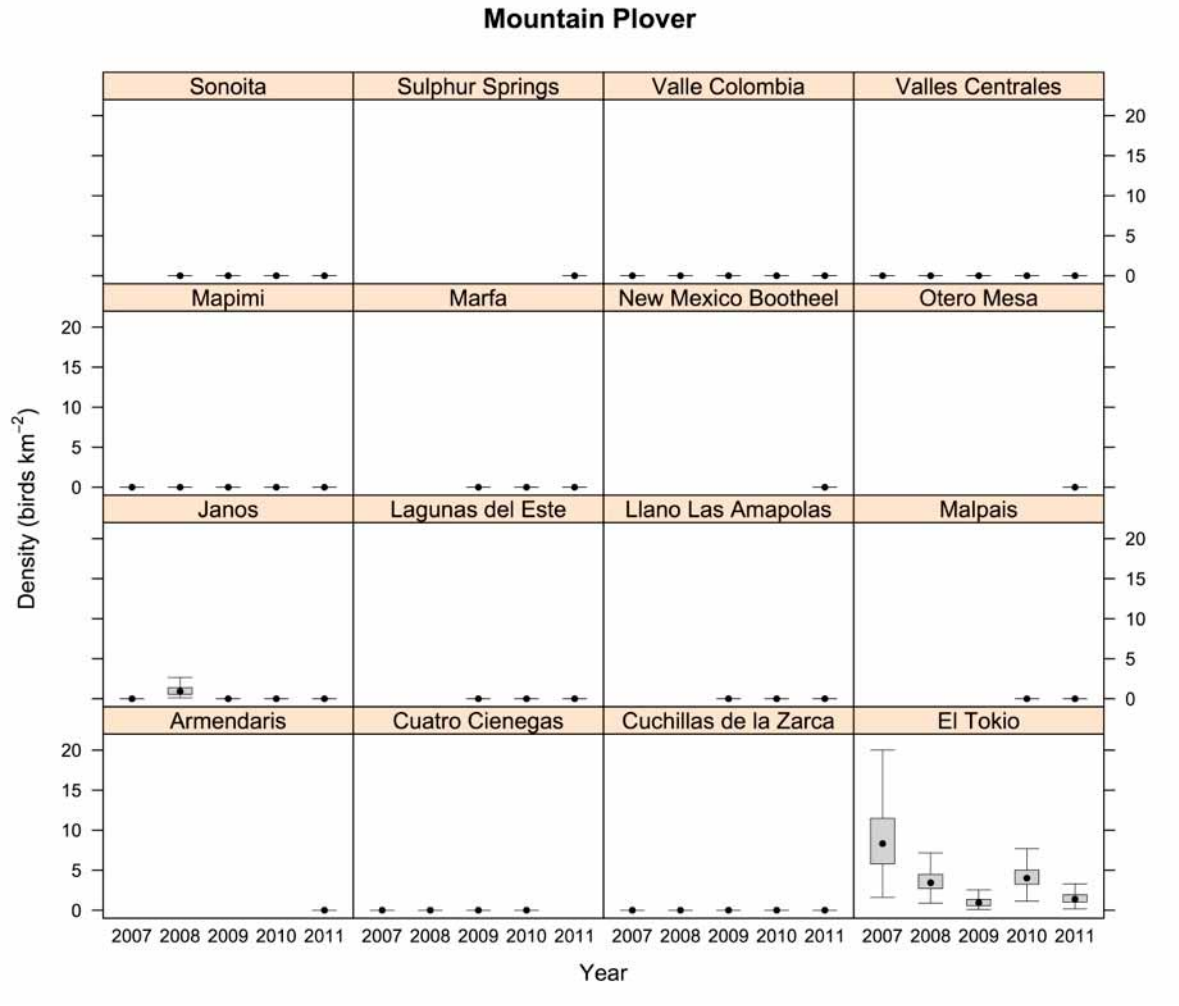

Mourning Dove
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
20
40
60
80
100
2007 2008 2009 2010 2011
Year

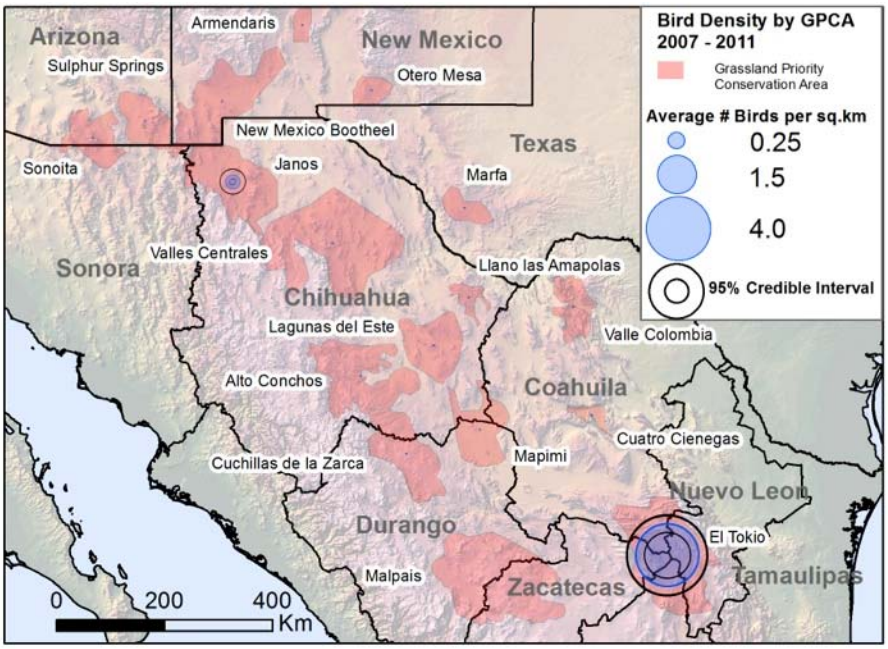

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
3.0
20
50
95% Credible Interval

Mountain Plover (*n* = 31)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
El Tokio	Mean	9.14	3.67	1.02	4.24	1.53	3.92
	SD	4.67	1.37	0.59	1.39	0.75	1.12
	2.5%	2.69	1.53	0.20	2.19	0.45	2.16
	25.0%	5.78	2.71	0.58	3.24	1.01	3.14
	50.0%	8.32	3.43	0.94	4.01	1.38	3.76
	75.0%	11.47	4.48	1.37	5.02	1.93	4.53
	97.5%	21.07	6.78	2.47	7.61	3.36	6.59
Janos	Mean	0.00	1.11	0.00	0.00	0.00	0.22
	SD	0.00	0.79	0.00	0.00	0.00	0.16
	2.5%	0.00	0.21	0.00	0.00	0.00	0.04
	25.0%	0.00	0.55	0.00	0.00	0.00	0.11
	50.0%	0.00	0.93	0.00	0.00	0.00	0.19
	75.0%	0.00	1.40	0.00	0.00	0.00	0.28
	97.5%	0.00	3.28	0.00	0.00	0.00	0.66
Lagunas del Este	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.00	0.00	0.00
	SD				0.00	0.00	0.00
	2.5%				0.00	0.00	0.00
	25.0%				0.00	0.00	0.00
	50.0%				0.00	0.00	0.00
	75.0%				0.00	0.00	0.00
	97.5%				0.00	0.00	0.00

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Marfa	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
New Mexico Bootheel	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	0.00	0.00	0.00	0.00
	SD		0.00	0.00	0.00	0.00	0.00
	2.5%		0.00	0.00	0.00	0.00	0.00
	25.0%		0.00	0.00	0.00	0.00	0.00
	50.0%		0.00	0.00	0.00	0.00	0.00
	75.0%		0.00	0.00	0.00	0.00	0.00
	97.5%		0.00	0.00	0.00	0.00	0.00
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Valles Centrales	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00

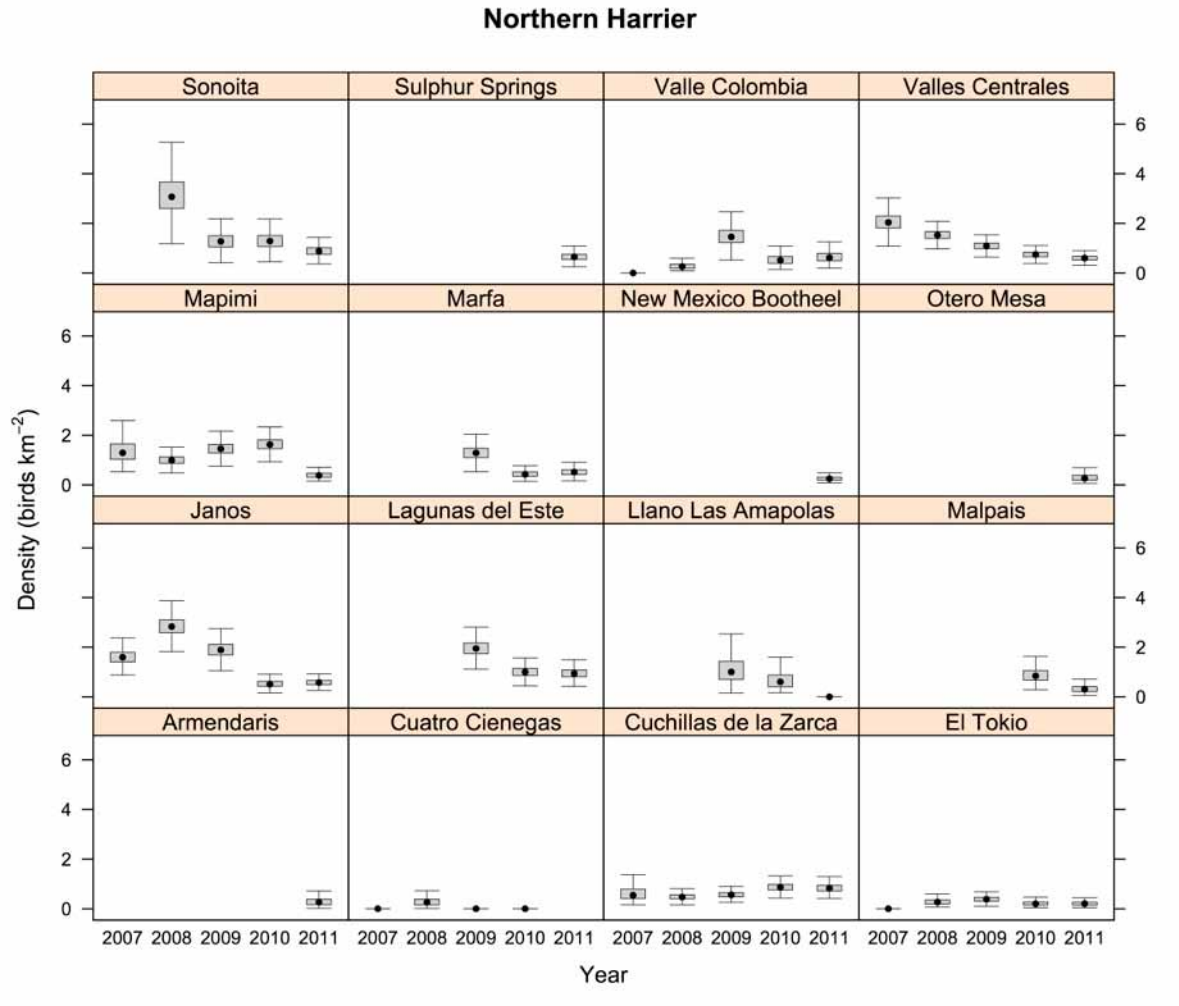

Mountain Plover
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
5
10
15
20
2007 2008 2009 2010 2011
Year

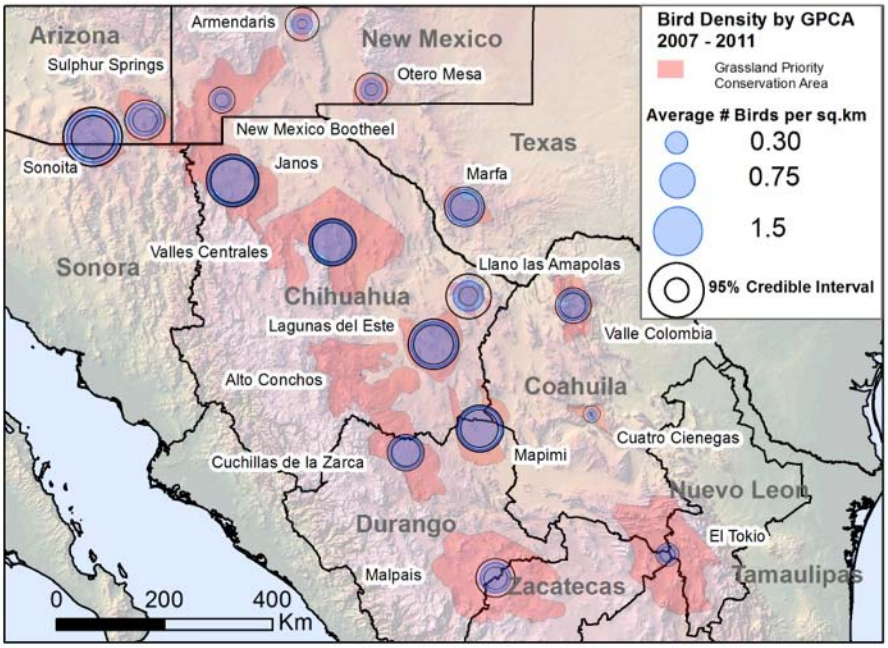

Arizona
Armendaris
New Mexico
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Texas
Sonoita
Janos
Marfa
Valles Centrales
Sonora
Llano las Amapolas
Chihuahua
Lagunas del Este
Valle Colombia
Alto Conchos
Coahuila
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
Nuevo Leon
Durango
El Tokio
Malpais
Zacatecas
Tamaulipas
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.25
1.5
4.0
95% Credible Interval

Northern Harrier (*n* = 782)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.29	0.29
	SD					0.17	0.17
	2.5%					0.06	0.06
	25.0%					0.16	0.16
	50.0%					0.26	0.26
	75.0%					0.39	0.39
	97.5%					0.72	0.72
Cuatro Ciénegas	Mean	0.00	0.29	0.00	0.00		0.07
	SD	0.00	0.19	0.00	0.00		0.05
	2.5%	0.00	0.03	0.00	0.00		0.01
	25.0%	0.00	0.16	0.00	0.00		0.04
	50.0%	0.00	0.26	0.00	0.00		0.07
	75.0%	0.00	0.38	0.00	0.00		0.10
	97.5%	0.00	0.76	0.00	0.00		0.19
Cuchillas de la Zarca	Mean	0.63	0.49	0.57	0.88	0.84	0.68
	SD	0.29	0.13	0.13	0.17	0.18	0.09
	2.5%	0.25	0.29	0.35	0.58	0.55	0.53
	25.0%	0.41	0.40	0.48	0.76	0.72	0.61
	50.0%	0.55	0.47	0.56	0.87	0.83	0.67
	75.0%	0.79	0.56	0.65	0.98	0.95	0.74
	97.5%	1.34	0.77	0.87	1.23	1.23	0.89
El Tokio	Mean	0.00	0.28	0.39	0.22	0.22	0.22
	SD	0.00	0.11	0.12	0.10	0.09	0.05
	2.5%	0.00	0.12	0.19	0.09	0.09	0.14
	25.0%	0.00	0.20	0.31	0.15	0.15	0.19
	50.0%	0.00	0.27	0.38	0.20	0.21	0.22
	75.0%	0.00	0.36	0.46	0.28	0.26	0.25
	97.5%	0.00	0.54	0.66	0.47	0.42	0.34
Janos	Mean	1.61	2.85	1.91	0.53	0.58	1.50
	SD	0.28	0.38	0.32	0.15	0.13	0.13
	2.5%	1.11	2.17	1.34	0.27	0.35	1.26
	25.0%	1.41	2.58	1.69	0.43	0.49	1.41
	50.0%	1.60	2.83	1.89	0.51	0.57	1.49
	75.0%	1.80	3.10	2.11	0.62	0.66	1.58
	97.5%	2.21	3.65	2.60	0.84	0.85	1.75
Lagunas del Este	Mean			1.97	1.01	0.95	1.31
	SD			0.31	0.21	0.20	0.16
	2.5%			1.42	0.63	0.59	1.02
	25.0%			1.74	0.86	0.81	1.20
	50.0%			1.95	1.00	0.94	1.31
	75.0%			2.17	1.15	1.08	1.41
	97.5%			2.64	1.45	1.40	1.62
Llano Las Amapolas	Mean			1.13	0.70	0.00	0.61
	SD			0.62	0.39	0.00	0.27
	2.5%			0.29	0.22	0.00	0.23
	25.0%			0.70	0.40	0.00	0.40
	50.0%			1.00	0.60	0.00	0.56
	75.0%			1.43	0.88	0.00	0.74
	97.5%			2.78	1.78	0.00	1.29
Malpaís	Mean				0.89	0.32	0.61
	SD				0.30	0.15	0.17
	2.5%				0.43	0.10	0.34
	25.0%				0.68	0.21	0.48
	50.0%				0.84	0.31	0.59
	75.0%				1.06	0.41	0.71
	97.5%				1.58	0.67	0.97

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	1.36	1.01	1.47	1.64	0.40	1.17
	SD	0.43	0.21	0.26	0.27	0.12	0.13
	2.5%	0.70	0.65	1.00	1.14	0.22	0.93
	25.0%	1.03	0.87	1.28	1.46	0.31	1.08
	50.0%	1.29	0.99	1.46	1.63	0.38	1.17
	75.0%	1.65	1.13	1.64	1.81	0.47	1.26
	97.5%	2.27	1.46	2.00	2.18	0.66	1.45
Marfa	Mean			1.30	0.44	0.52	0.75
	SD			0.28	0.12	0.16	0.12
	2.5%			0.79	0.24	0.25	0.53
	25.0%			1.10	0.35	0.42	0.68
	50.0%			1.29	0.42	0.52	0.75
	75.0%			1.48	0.52	0.61	0.83
	97.5%			1.89	0.72	0.86	0.99
New Mexico Bootheel	Mean					0.26	0.26
	SD					0.08	0.08
	2.5%					0.13	0.13
	25.0%					0.20	0.20
	50.0%					0.25	0.25
	75.0%					0.31	0.31
	97.5%					0.45	0.45
Otero Mesa	Mean					0.31	0.31
	SD					0.16	0.16
	2.5%					0.10	0.10
	25.0%					0.19	0.19
	50.0%					0.27	0.27
	75.0%					0.39	0.39
	97.5%					0.69	0.69
Sonoita	Mean		3.17	1.31	1.32	0.89	1.67
	SD		0.81	0.35	0.35	0.20	0.26
	2.5%		1.81	0.74	0.74	0.53	1.21
	25.0%		2.60	1.05	1.07	0.75	1.48
	50.0%		3.07	1.27	1.29	0.88	1.65
	75.0%		3.67	1.50	1.51	1.02	1.84
	97.5%		4.96	2.09	2.13	1.30	2.23
Sulphur Springs	Mean					0.66	0.66
	SD					0.16	0.16
	2.5%					0.38	0.38
	25.0%					0.55	0.55
	50.0%					0.65	0.65
	75.0%					0.76	0.76
	97.5%					1.02	1.02
Valle Colombia	Mean	0.00	0.28	1.49	0.54	0.66	0.59
	SD	0.00	0.11	0.36	0.22	0.22	0.12
	2.5%	0.00	0.12	0.87	0.23	0.32	0.40
	25.0%	0.00	0.19	1.22	0.39	0.49	0.51
	50.0%	0.00	0.26	1.46	0.51	0.62	0.58
	75.0%	0.00	0.35	1.72	0.67	0.79	0.67
	97.5%	0.00	0.53	2.26	1.07	1.16	0.84
Valles Centrales	Mean	2.06	1.53	1.10	0.75	0.60	1.21
	SD	0.37	0.21	0.17	0.14	0.11	0.11
	2.5%	1.40	1.16	0.79	0.50	0.40	1.01
	25.0%	1.81	1.39	0.98	0.65	0.53	1.13
	50.0%	2.04	1.53	1.09	0.74	0.60	1.20
	75.0%	2.29	1.67	1.20	0.83	0.68	1.28
	97.5%	2.84	1.96	1.46	1.06	0.83	1.43

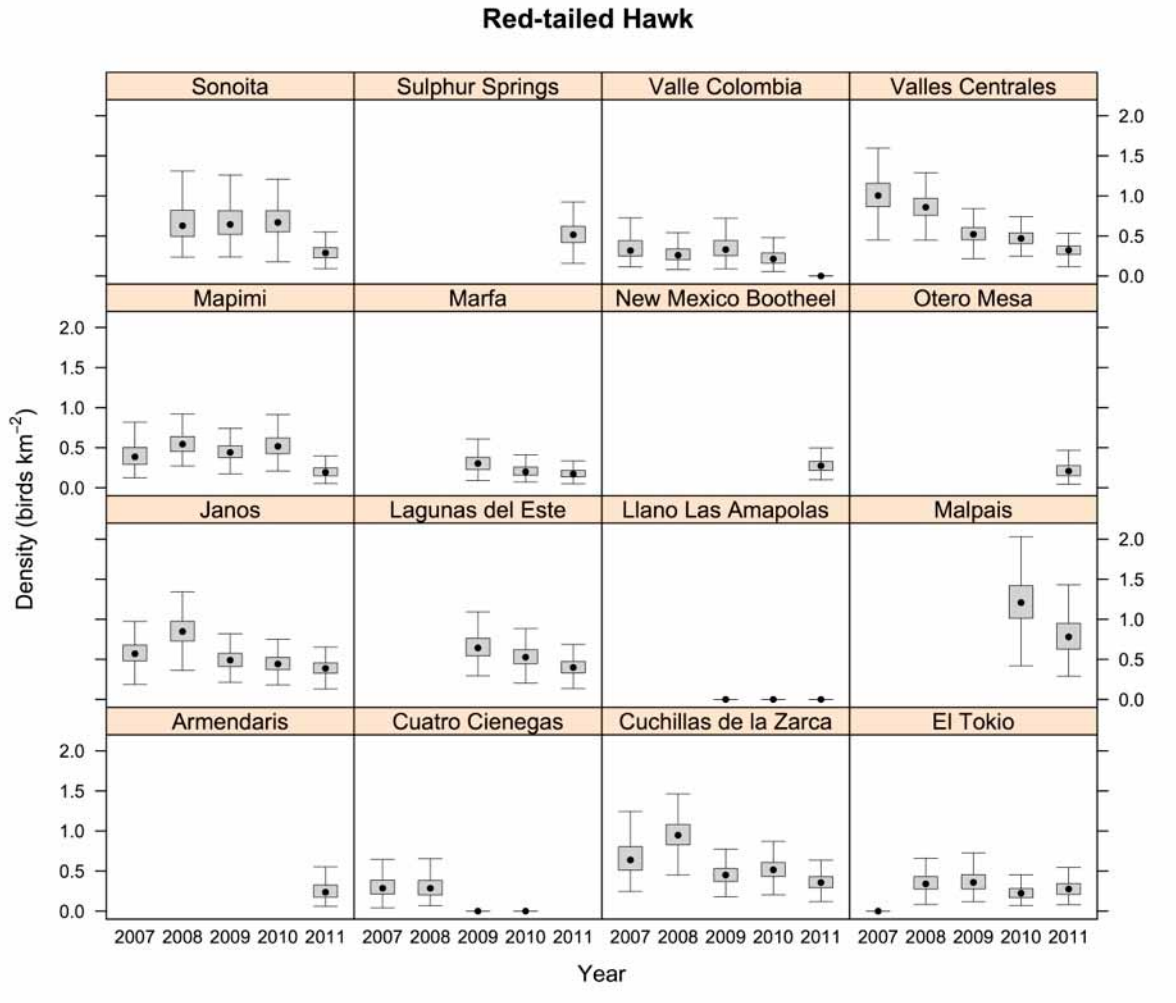

Northern Harrier
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
2
4
6
2007 2008 2009 2010 2011
Year

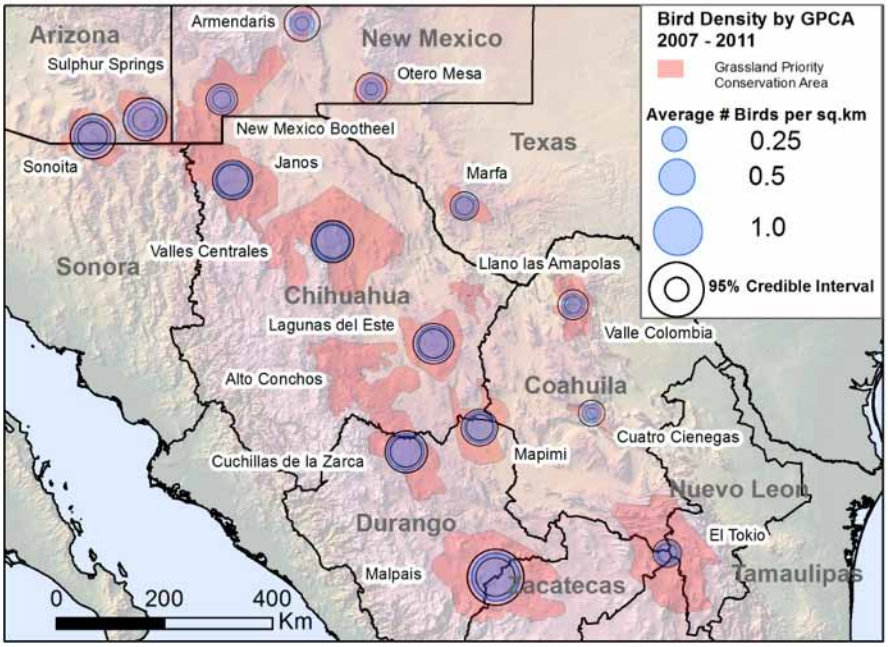

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.30
0.75
1.5
95% Credible Interval
0
200
400
Km

Red-tailed Hawk (*n* = 409)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.26	0.26
	SD					0.12	0.12
	2.5%					0.09	0.09
	25.0%					0.17	0.17
	50.0%					0.24	0.24
	75.0%					0.33	0.33
	97.5%					0.56	0.56
Cuatro Ciénegas	Mean	0.32	0.31	0.00	0.00		0.16
	SD	0.16	0.15	0.00	0.00		0.06
	2.5%	0.08	0.11	0.00	0.00		0.06
	25.0%	0.21	0.20	0.00	0.00		0.11
	50.0%	0.29	0.29	0.00	0.00		0.15
	75.0%	0.39	0.38	0.00	0.00		0.19
	97.5%	0.73	0.70	0.00	0.00		0.30
Cuchillas de la Zarca	Mean	0.68	0.96	0.46	0.53	0.36	0.60
	SD	0.22	0.19	0.12	0.13	0.10	0.08
	2.5%	0.35	0.64	0.25	0.30	0.20	0.45
	25.0%	0.51	0.83	0.37	0.43	0.29	0.54
	50.0%	0.64	0.95	0.45	0.52	0.36	0.59
	75.0%	0.80	1.08	0.53	0.61	0.43	0.65
	97.5%	1.19	1.37	0.73	0.82	0.58	0.78
El Tokio	Mean	0.00	0.36	0.37	0.23	0.28	0.25
	SD	0.00	0.12	0.13	0.09	0.10	0.05
	2.5%	0.00	0.17	0.17	0.10	0.13	0.15
	25.0%	0.00	0.28	0.28	0.17	0.21	0.21
	50.0%	0.00	0.34	0.36	0.22	0.28	0.25
	75.0%	0.00	0.43	0.46	0.28	0.34	0.29
	97.5%	0.00	0.62	0.67	0.44	0.49	0.36
Janos	Mean	0.58	0.86	0.50	0.46	0.40	0.56
	SD	0.14	0.18	0.13	0.12	0.10	0.07
	2.5%	0.34	0.54	0.30	0.26	0.21	0.43
	25.0%	0.48	0.73	0.41	0.37	0.33	0.51
	50.0%	0.57	0.85	0.49	0.44	0.39	0.56
	75.0%	0.68	0.98	0.58	0.52	0.46	0.61
	97.5%	0.90	1.21	0.78	0.74	0.61	0.71
Lagunas del Este	Mean			0.66	0.54	0.41	0.54
	SD			0.17	0.14	0.11	0.09
	2.5%			0.39	0.31	0.22	0.37
	25.0%			0.54	0.45	0.33	0.47
	50.0%			0.64	0.53	0.40	0.53
	75.0%			0.76	0.62	0.47	0.59
	97.5%			1.04	0.85	0.64	0.75
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				1.24	0.80	1.02
	SD				0.31	0.24	0.21
	2.5%				0.71	0.42	0.66
	25.0%				1.01	0.63	0.87
	50.0%				1.21	0.78	1.00
	75.0%				1.42	0.95	1.16
	97.5%				1.92	1.35	1.45

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.41	0.56	0.46	0.53	0.20	0.43
	SD	0.16	0.14	0.12	0.14	0.08	0.07
	2.5%	0.17	0.34	0.27	0.29	0.08	0.31
	25.0%	0.29	0.45	0.38	0.43	0.15	0.38
	50.0%	0.39	0.54	0.44	0.52	0.19	0.43
	75.0%	0.50	0.64	0.52	0.62	0.25	0.48
	97.5%	0.80	0.85	0.76	0.83	0.38	0.59
Marfa	Mean			0.32	0.21	0.18	0.24
	SD			0.12	0.08	0.07	0.06
	2.5%			0.14	0.11	0.08	0.14
	25.0%			0.23	0.16	0.14	0.19
	50.0%			0.30	0.20	0.17	0.23
	75.0%			0.38	0.26	0.21	0.27
	97.5%			0.59	0.40	0.34	0.36
New Mexico Bootheel	Mean					0.28	0.28
	SD					0.08	0.08
	2.5%					0.14	0.14
	25.0%					0.22	0.22
	50.0%					0.27	0.27
	75.0%					0.33	0.33
	97.5%					0.45	0.45
Otero Mesa	Mean					0.22	0.22
	SD					0.10	0.10
	2.5%					0.08	0.08
	25.0%					0.15	0.15
	50.0%					0.21	0.21
	75.0%					0.28	0.28
	97.5%					0.44	0.44
Sonoita	Mean		0.69	0.69	0.70	0.30	0.60
	SD		0.29	0.24	0.22	0.10	0.12
	2.5%		0.32	0.34	0.35	0.15	0.39
	25.0%		0.49	0.52	0.55	0.23	0.51
	50.0%		0.63	0.64	0.67	0.29	0.58
	75.0%		0.82	0.82	0.82	0.36	0.66
	97.5%		1.56	1.32	1.20	0.54	0.89
Sulphur Springs	Mean					0.53	0.53
	SD					0.15	0.15
	2.5%					0.26	0.26
	25.0%					0.42	0.42
	50.0%					0.52	0.52
	75.0%					0.62	0.62
	97.5%					0.84	0.84
Valle Colombia	Mean	0.37	0.28	0.36	0.23	0.00	0.25
	SD	0.18	0.10	0.15	0.09	0.00	0.07
	2.5%	0.16	0.12	0.15	0.09	0.00	0.12
	25.0%	0.25	0.20	0.26	0.16	0.00	0.19
	50.0%	0.32	0.26	0.33	0.21	0.00	0.24
	75.0%	0.44	0.34	0.44	0.29	0.00	0.30
	97.5%	0.88	0.52	0.73	0.45	0.00	0.41
Valles Centrales	Mean	1.02	0.87	0.53	0.48	0.32	0.65
	SD	0.23	0.15	0.12	0.11	0.08	0.07
	2.5%	0.63	0.61	0.32	0.31	0.18	0.51
	25.0%	0.86	0.76	0.45	0.40	0.27	0.59
	50.0%	1.00	0.86	0.52	0.47	0.32	0.64
	75.0%	1.16	0.97	0.61	0.54	0.37	0.70
	97.5%	1.55	1.20	0.78	0.74	0.48	0.80

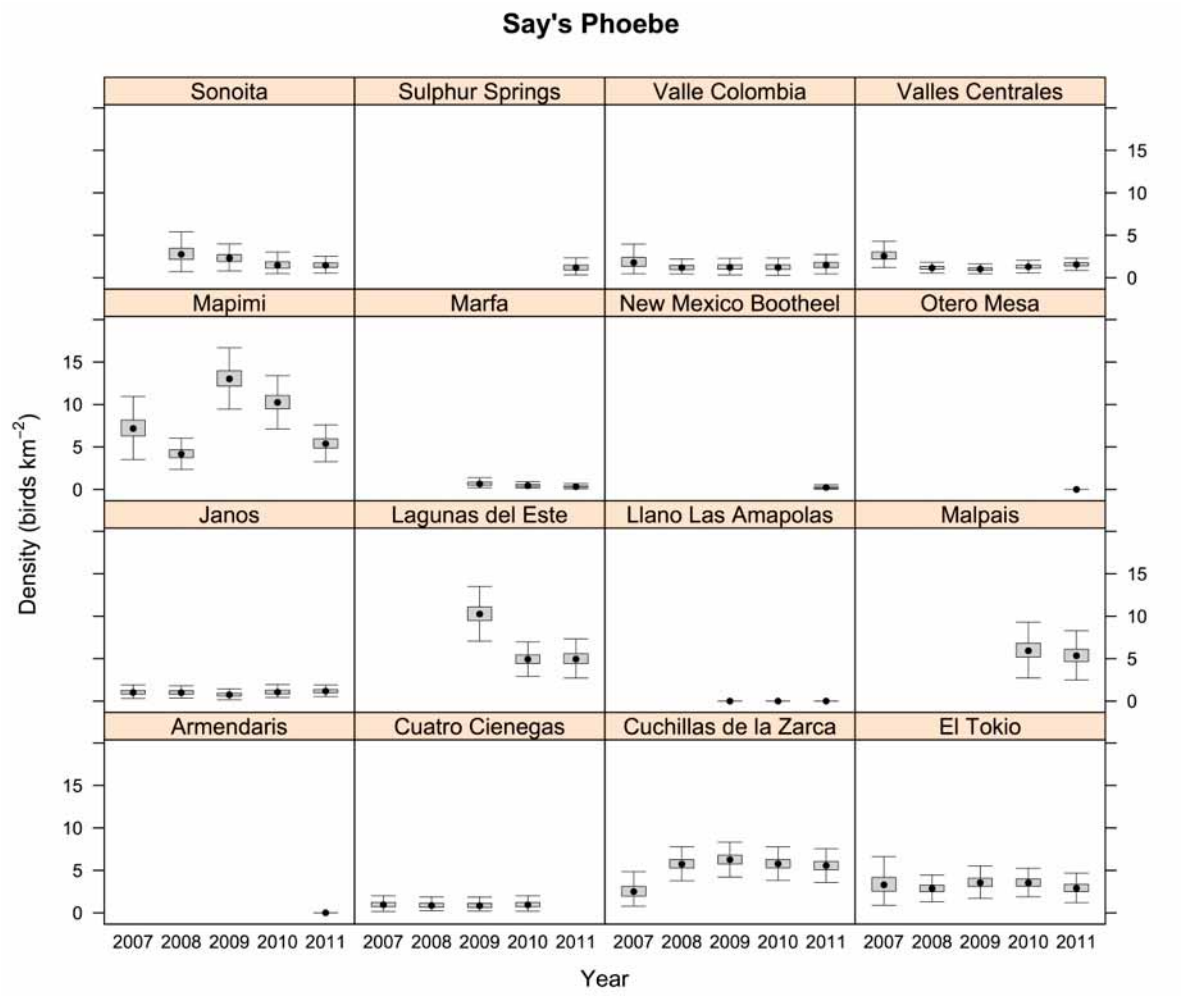

Red-tailed Hawk
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0.0
0.5
1.0
1.5
2.0
2007 2008 2009 2010 2011
Year

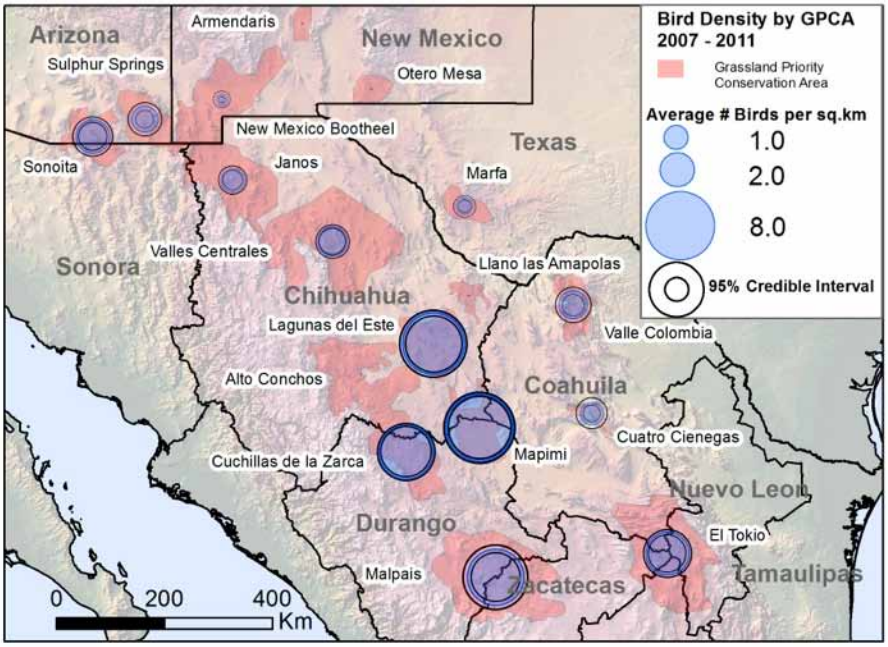

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Durango
Nuevo Leon
Tamaulipas
Zacatecas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.25
0.5
1.0
95% Credible Interval

Say's Phoebe (*n* = 996)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	1.03	0.93	0.91	1.04		0.98
	SD	0.49	0.39	0.40	0.45		0.31
	2.5%	0.37	0.38	0.37	0.41		0.53
	25.0%	0.72	0.65	0.63	0.72		0.77
	50.0%	0.95	0.86	0.84	0.94		0.92
	75.0%	1.23	1.15	1.11	1.24		1.12
	97.5%	2.39	1.89	1.88	2.23		1.83
Cuchillas de la Zarca	Mean	2.59	5.77	6.30	5.82	5.58	5.21
	SD	0.87	0.75	0.78	0.74	0.74	0.38
	2.5%	1.18	4.40	4.89	4.48	4.18	4.51
	25.0%	1.96	5.26	5.76	5.30	5.07	4.95
	50.0%	2.50	5.74	6.26	5.78	5.56	5.21
	75.0%	3.11	6.27	6.79	6.29	6.06	5.46
	97.5%	4.65	7.31	7.99	7.40	7.09	5.97
El Tokio	Mean	3.43	2.89	3.61	3.60	2.96	3.30
	SD	1.19	0.60	0.71	0.65	0.65	0.42
	2.5%	1.48	1.77	2.39	2.48	1.81	2.54
	25.0%	2.54	2.48	3.11	3.15	2.50	3.01
	50.0%	3.30	2.86	3.55	3.53	2.90	3.27
	75.0%	4.17	3.27	4.08	3.98	3.37	3.56
	97.5%	6.01	4.11	5.08	5.06	4.37	4.18
Janos	Mean	1.05	1.04	0.78	1.09	1.20	1.03
	SD	0.33	0.32	0.25	0.32	0.28	0.16
	2.5%	0.47	0.53	0.35	0.60	0.74	0.74
	25.0%	0.82	0.81	0.60	0.84	1.00	0.91
	50.0%	1.02	1.00	0.75	1.05	1.17	1.03
	75.0%	1.25	1.21	0.94	1.28	1.37	1.14
	97.5%	1.81	1.76	1.32	1.81	1.82	1.38
Lagunas del Este	Mean			10.32	4.97	5.03	6.77
	SD			1.22	0.76	0.85	0.58
	2.5%			8.13	3.60	3.57	5.68
	25.0%			9.48	4.43	4.42	6.38
	50.0%			10.25	4.93	4.95	6.76
	75.0%			11.09	5.45	5.58	7.16
	97.5%			12.95	6.56	6.90	7.96
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				6.05	5.42	5.73
	SD				1.26	1.11	0.83
	2.5%				3.83	3.40	4.26
	25.0%				5.17	4.66	5.16
	50.0%				5.93	5.35	5.69
	75.0%				6.83	6.11	6.26
	97.5%				8.81	7.85	7.48

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	7.28	4.21	13.10	10.30	5.45	8.07
	SD	1.43	0.70	1.35	1.13	0.84	0.56
	2.5%	4.67	2.95	10.65	8.22	3.92	7.00
	25.0%	6.30	3.73	12.16	9.49	4.89	7.68
	50.0%	7.17	4.17	13.02	10.25	5.38	8.05
	75.0%	8.16	4.65	13.97	11.06	5.97	8.45
	97.5%	10.40	5.78	15.95	12.61	7.24	9.21
Marfa	Mean			0.71	0.47	0.35	0.51
	SD			0.28	0.17	0.14	0.15
	2.5%			0.31	0.20	0.15	0.27
	25.0%			0.51	0.34	0.24	0.40
	50.0%			0.67	0.45	0.32	0.50
	75.0%			0.86	0.57	0.43	0.59
	97.5%			1.42	0.86	0.71	0.85
New Mexico Bootheel	Mean					0.24	0.24
	SD					0.11	0.11
	2.5%					0.07	0.07
	25.0%					0.16	0.16
	50.0%					0.23	0.23
	75.0%					0.31	0.31
	97.5%					0.49	0.49
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		2.86	2.36	1.55	1.49	2.07
	SD		0.95	0.63	0.57	0.37	0.37
	2.5%		1.31	1.32	0.70	0.85	1.39
	25.0%		2.15	1.91	1.14	1.23	1.80
	50.0%		2.76	2.31	1.47	1.46	2.04
	75.0%		3.46	2.74	1.89	1.74	2.32
	97.5%		4.94	3.74	2.88	2.29	2.85
Sulphur Springs	Mean					1.22	1.22
	SD					0.40	0.40
	2.5%					0.54	0.54
	25.0%					0.92	0.92
	50.0%					1.19	1.19
	75.0%					1.49	1.49
	97.5%					2.05	2.05
Valle Colombia	Mean	1.96	1.24	1.29	1.28	1.54	1.46
	SD	0.85	0.37	0.39	0.41	0.52	0.34
	2.5%	0.76	0.65	0.65	0.64	0.71	0.87
	25.0%	1.35	0.96	1.01	0.98	1.18	1.22
	50.0%	1.79	1.18	1.23	1.22	1.49	1.43
	75.0%	2.40	1.45	1.52	1.52	1.81	1.66
	97.5%	4.10	2.10	2.18	2.23	2.78	2.24
Valles Centrales	Mean	2.66	1.18	1.04	1.31	1.59	1.55
	SD	0.64	0.24	0.21	0.28	0.28	0.19
	2.5%	1.68	0.76	0.66	0.80	1.10	1.23
	25.0%	2.19	1.01	0.89	1.11	1.39	1.42
	50.0%	2.56	1.15	1.03	1.30	1.56	1.54
	75.0%	3.04	1.33	1.18	1.49	1.76	1.67
	97.5%	4.17	1.69	1.50	1.90	2.18	1.95

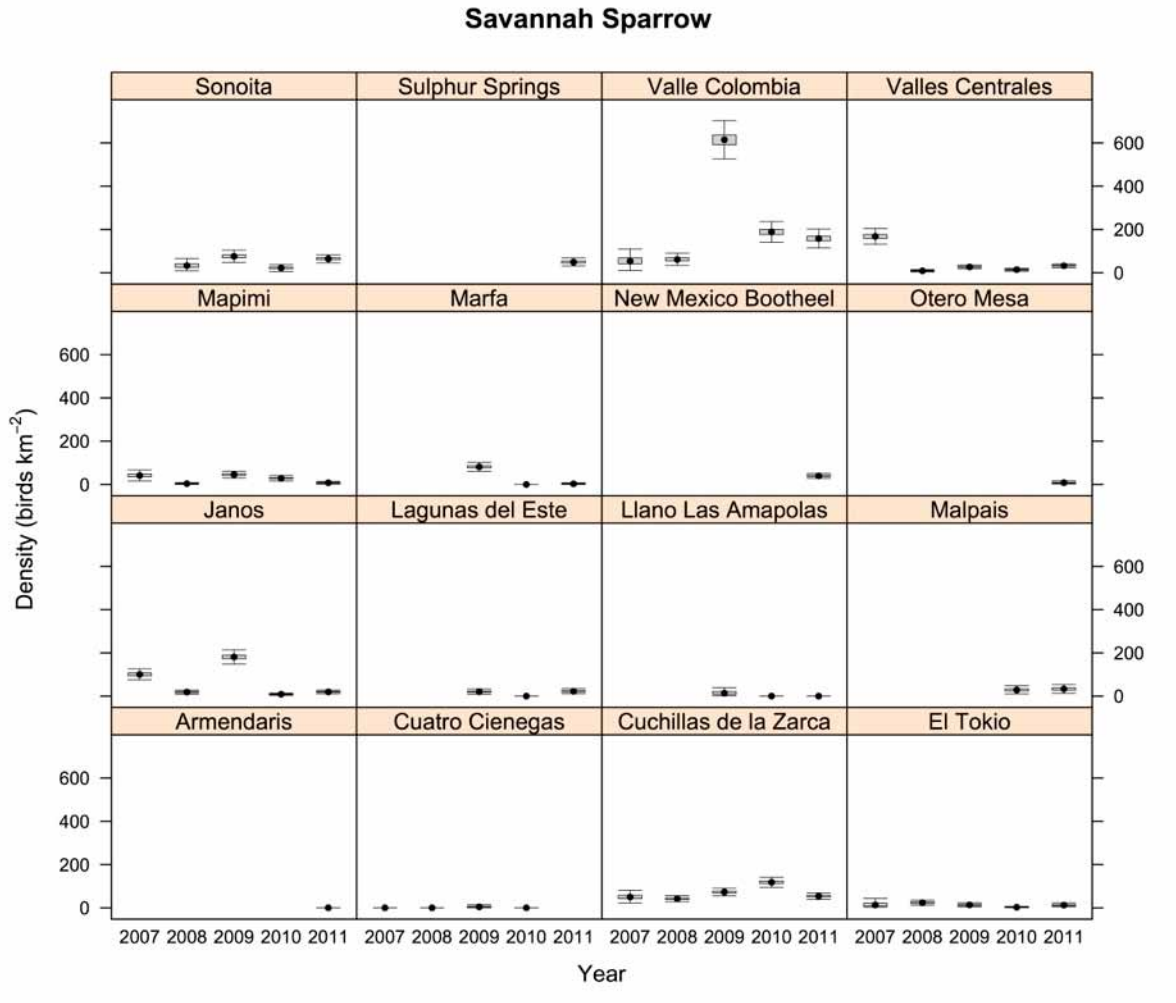

Say's Phoebe
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
5
10
15
2007 2008 2009 2010 2011
Year

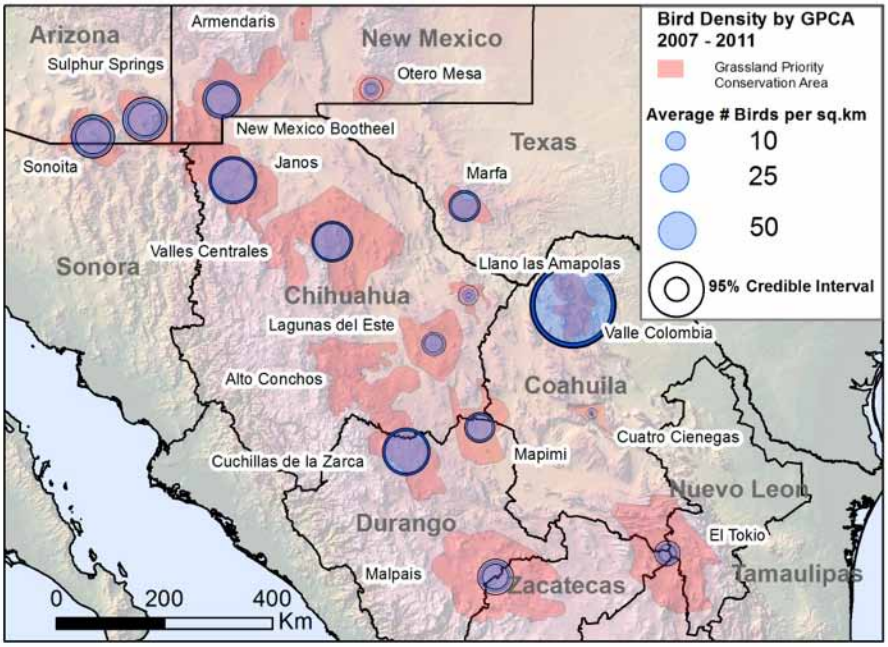

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority
Conservation Area
Average # Birds per sq.km
1.0
2.0
8.0
95% Credible Interval

Savannah Sparrow (*n* = 2,606)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	5.24	0.00		1.31
	SD	0.00	0.00	4.02	0.00		1.00
	2.5%	0.00	0.00	0.40	0.00		0.10
	25.0%	0.00	0.00	2.25	0.00		0.56
	50.0%	0.00	0.00	4.32	0.00		1.08
	75.0%	0.00	0.00	7.33	0.00		1.83
	97.5%	0.00	0.00	15.15	0.00		3.79
Cuchillas de la Zarca	Mean	50.49	42.17	73.21	118.40	54.14	67.68
	SD	10.77	4.85	6.72	8.66	5.67	3.48
	2.5%	31.57	33.38	60.69	101.90	43.81	61.11
	25.0%	42.53	38.67	68.54	112.50	50.19	65.28
	50.0%	49.87	42.05	72.93	118.20	53.90	67.56
	75.0%	58.15	45.50	77.54	124.10	57.83	70.02
	97.5%	71.94	51.82	87.26	135.90	65.86	74.68
El Tokio	Mean	16.49	24.01	13.75	2.97	12.73	13.99
	SD	10.75	4.88	3.89	1.66	3.67	2.65
	2.5%	4.56	15.74	7.37	0.64	6.21	9.66
	25.0%	8.15	20.72	10.94	1.75	10.00	12.09
	50.0%	13.10	23.59	13.37	2.70	12.45	13.73
	75.0%	22.12	26.83	16.04	3.73	15.34	15.52
	97.5%	43.39	34.68	22.34	7.28	20.19	20.03
Janos	Mean	100.91	18.86	181.13	8.94	19.74	65.92
	SD	9.47	3.59	12.25	2.33	3.14	3.35
	2.5%	83.50	12.17	157.60	5.01	14.29	59.54
	25.0%	94.29	16.41	172.70	7.28	17.46	63.62
	50.0%	100.40	18.61	181.00	8.74	19.56	65.83
	75.0%	107.10	21.03	189.30	10.30	21.81	68.13
	97.5%	120.80	26.58	205.90	14.25	26.45	72.75
Lagunas del Este	Mean			20.97	0.00	22.82	14.60
	SD			4.56	0.00	4.27	2.09
	2.5%			13.31	0.00	15.38	10.87
	25.0%			17.67	0.00	19.70	13.13
	50.0%			20.60	0.00	22.54	14.49
	75.0%			23.80	0.00	25.61	15.92
	97.5%			30.91	0.00	31.91	18.99
Llano Las Amapolas	Mean			15.94	0.00	0.00	5.31
	SD			10.54	0.00	0.00	3.51
	2.5%			2.25	0.00	0.00	0.75
	25.0%			8.60	0.00	0.00	2.87
	50.0%			14.10	0.00	0.00	4.70
	75.0%			21.15	0.00	0.00	7.05
	97.5%			39.27	0.00	0.00	13.09
Malpaís	Mean				29.16	33.50	31.33
	SD				7.01	7.59	5.01
	2.5%				17.16	20.32	21.52
	25.0%				24.25	27.98	28.11
	50.0%				28.53	33.05	31.24
	75.0%				33.61	38.35	34.38
	97.5%				44.17	49.90	41.77

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	41.87	3.92	45.48	28.87	7.62	25.55
	SD	9.47	1.88	5.95	4.68	2.44	2.64
	2.5%	25.19	0.87	34.78	20.16	3.29	20.66
	25.0%	35.32	2.68	41.31	25.55	5.86	23.67
	50.0%	41.12	3.71	45.20	28.67	7.48	25.48
	75.0%	48.05	4.91	49.25	31.99	9.21	27.32
	97.5%	61.71	8.55	58.06	38.55	12.57	30.94
Marfa	Mean			81.60	0.00	3.04	28.21
	SD			7.62	0.00	1.50	2.59
	2.5%			67.14	0.00	0.43	23.24
	25.0%			76.39	0.00	1.94	26.45
	50.0%			81.42	0.00	2.87	28.15
	75.0%			86.59	0.00	4.07	29.89
	97.5%			97.17	0.00	6.11	33.48
New Mexico Bootheel	Mean					39.38	39.38
	SD					4.04	4.04
	2.5%					31.92	31.92
	25.0%					36.55	36.55
	50.0%					39.23	39.23
	75.0%					42.04	42.04
	97.5%					47.65	47.65
Otero Mesa	Mean					8.55	8.55
	SD					3.59	3.59
	2.5%					3.57	3.57
	25.0%					5.96	5.96
	50.0%					7.87	7.87
	75.0%					10.42	10.42
	97.5%					16.97	16.97
Sonoita	Mean		33.64	76.44	22.14	64.73	49.24
	SD		11.89	10.74	5.82	7.01	4.85
	2.5%		13.53	57.92	11.60	51.98	40.43
	25.0%		24.98	68.73	18.06	59.84	45.83
	50.0%		32.68	75.79	21.99	64.45	48.98
	75.0%		41.38	83.09	25.86	69.18	52.37
	97.5%		58.80	99.86	34.47	79.40	59.34
Sulphur Springs	Mean					49.50	49.50
	SD					6.66	6.66
	2.5%					37.28	37.28
	25.0%					44.76	44.76
	50.0%					49.08	49.08
	75.0%					54.03	54.03
	97.5%					63.09	63.09
Valle Colombia	Mean	55.79	62.07	615.11	188.95	158.56	216.10
	SD	20.84	10.19	33.23	17.69	16.39	9.98
	2.5%	16.21	43.75	552.20	155.30	128.40	196.88
	25.0%	40.95	54.82	592.50	176.60	147.20	209.32
	50.0%	53.51	61.38	614.40	188.60	157.90	215.92
	75.0%	68.42	68.84	636.90	200.50	169.10	222.65
	97.5%	103.10	83.07	682.50	224.70	192.10	236.29
Valles Centrales	Mean	167.91	8.97	26.71	14.26	32.22	50.01
	SD	13.54	2.11	3.51	2.60	3.24	3.02
	2.5%	141.70	5.51	20.06	9.55	26.16	44.20
	25.0%	158.70	7.51	24.30	12.45	29.95	47.95
	50.0%	167.90	8.77	26.58	14.20	32.14	49.98
	75.0%	176.90	10.20	29.06	15.87	34.40	52.02
	97.5%	195.00	13.51	33.79	19.85	38.77	56.06

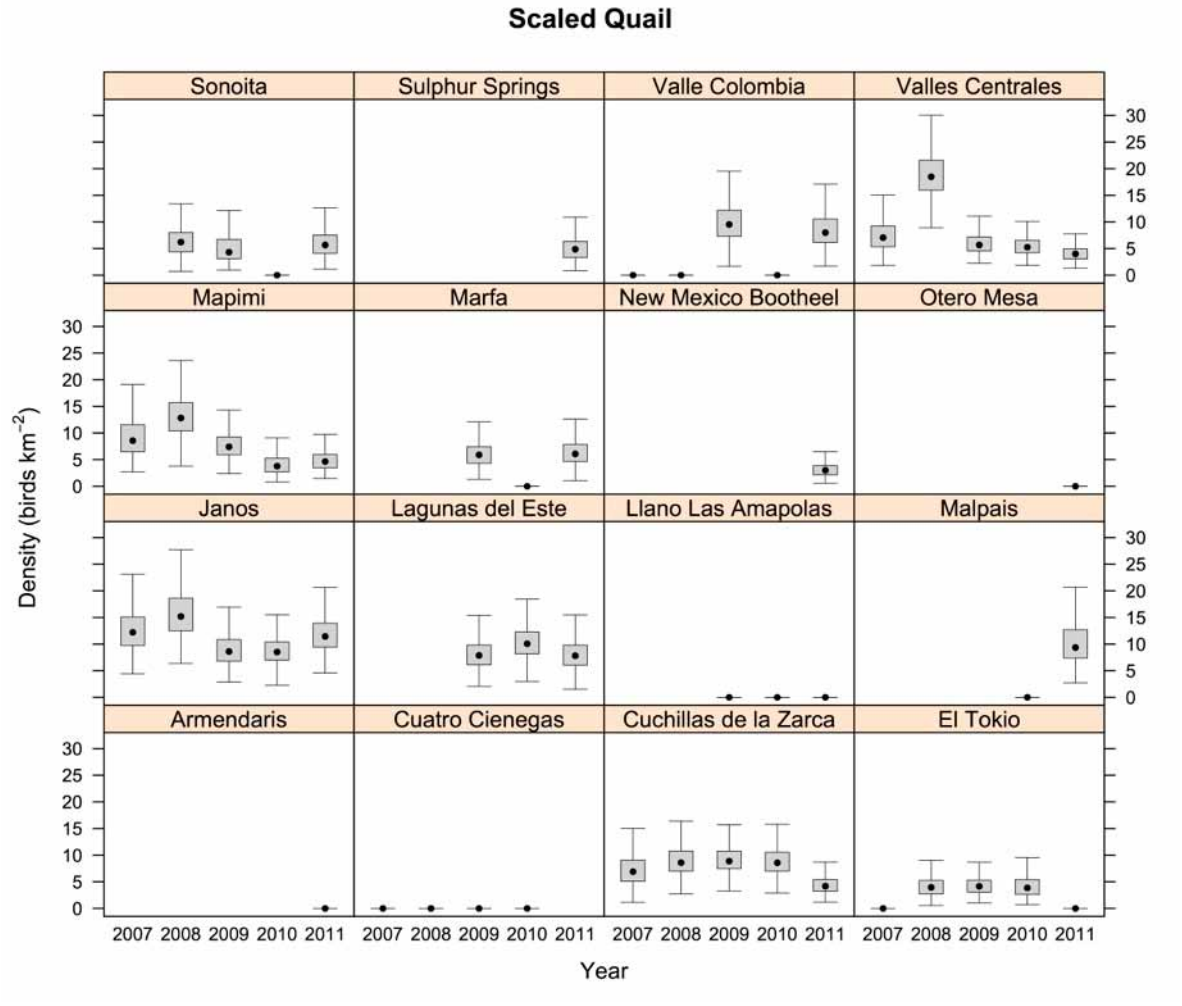

Savannah Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
200
400
600
2007 2008 2009 2010 2011
Year

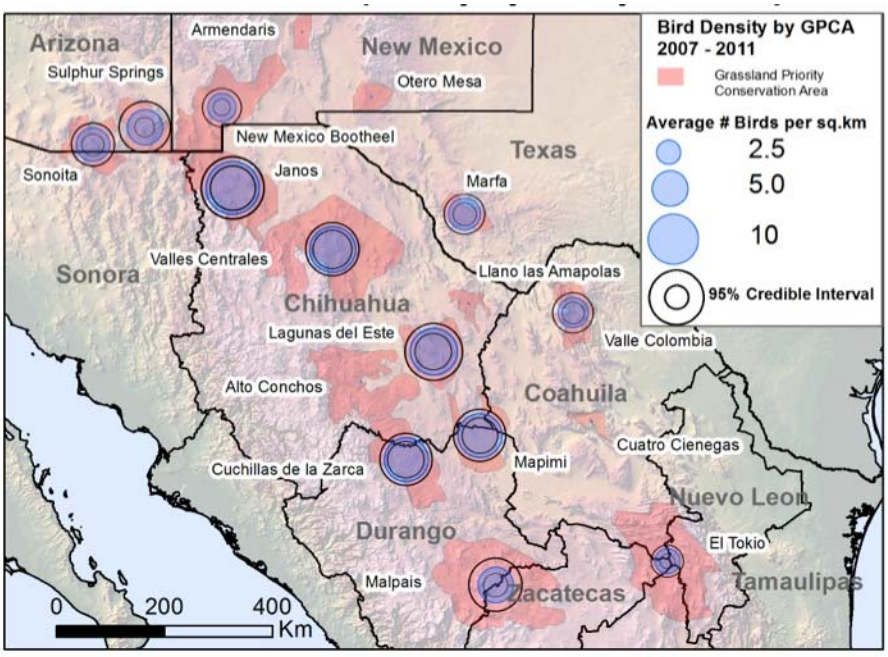

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
10
25
50
95% Credible Interval

Scaled Quail (*n* = 185)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	7.41	9.07	9.24	8.93	4.46	7.82
	SD	3.38	2.88	2.64	2.74	1.75	1.39
	2.5%	2.35	4.64	4.81	4.23	1.81	5.41
	25.0%	5.09	7.02	7.46	7.02	3.22	6.85
	50.0%	6.89	8.59	8.87	8.57	4.18	7.74
	75.0%	9.07	10.77	10.76	10.53	5.42	8.62
	97.5%	15.81	15.76	15.46	15.23	8.82	10.90
El Tokio	Mean	0.00	4.23	4.37	4.18	0.00	2.56
	SD	0.00	2.18	1.76	2.00	0.00	0.84
	2.5%	0.00	0.89	1.71	1.09	0.00	0.91
	25.0%	0.00	2.73	3.07	2.63	0.00	1.97
	50.0%	0.00	3.95	4.17	3.86	0.00	2.53
	75.0%	0.00	5.25	5.31	5.40	0.00	3.16
	97.5%	0.00	9.93	8.58	8.80	0.00	4.19
Janos	Mean	12.68	15.76	9.04	8.88	11.84	11.64
	SD	4.05	4.41	3.02	2.84	3.33	1.92
	2.5%	6.22	8.64	4.39	4.12	6.32	8.27
	25.0%	9.75	12.50	6.78	6.99	9.44	10.29
	50.0%	12.21	15.19	8.60	8.51	11.43	11.49
	75.0%	15.10	18.59	10.85	10.39	13.92	12.81
	97.5%	21.94	25.57	16.12	15.56	19.62	15.83
Lagunas del Este	Mean			8.17	10.48	8.05	8.90
	SD			2.85	3.30	2.84	1.97
	2.5%			3.70	5.02	2.68	5.45
	25.0%			6.10	8.19	6.04	7.48
	50.0%			7.87	10.06	7.81	8.77
	75.0%			9.82	12.28	9.81	10.17
	97.5%			15.00	18.34	14.07	13.16
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.00	10.52	5.26
	SD				0.00	4.57	2.29
	2.5%				0.00	4.60	2.30
	25.0%				0.00	7.38	3.69
	50.0%				0.00	9.36	4.68
	75.0%				0.00	12.71	6.36
	97.5%				0.00	22.59	11.29

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	9.79	13.26	7.74	4.17	4.85	7.96
	SD	4.88	3.85	2.59	1.96	1.78	1.50
	2.5%	4.09	7.06	3.67	1.42	2.21	5.22
	25.0%	6.50	10.41	5.91	2.69	3.47	6.93
	50.0%	8.57	12.82	7.41	3.78	4.64	7.86
	75.0%	11.55	15.70	9.26	5.26	5.99	8.90
	97.5%	24.18	21.98	13.45	9.06	8.74	11.22
Marfa	Mean			6.03	0.00	6.43	4.15
	SD			2.25	0.00	2.56	1.22
	2.5%			2.25	0.00	2.35	2.13
	25.0%			4.33	0.00	4.66	3.28
	50.0%			5.89	0.00	6.07	4.02
	75.0%			7.43	0.00	7.85	4.89
	97.5%			11.08	0.00	12.72	6.87
New Mexico Bootheel	Mean					3.12	3.12
	SD					1.26	1.26
	2.5%					1.12	1.12
	25.0%					2.15	2.15
	50.0%					3.00	3.00
	75.0%					3.88	3.88
	97.5%					5.97	5.97
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		6.43	5.22	0.00	5.94	4.40
	SD		2.81	3.10	0.00	2.36	1.42
	2.5%		1.87	1.66	0.00	2.27	2.00
	25.0%		4.39	3.11	0.00	4.08	3.32
	50.0%		6.21	4.32	0.00	5.67	4.31
	75.0%		7.99	6.73	0.00	7.52	5.34
	97.5%		12.80	13.70	0.00	10.90	7.48
Sulphur Springs	Mean					5.09	5.09
	SD					2.32	2.32
	2.5%					1.63	1.63
	25.0%					3.33	3.33
	50.0%					4.88	4.88
	75.0%					6.35	6.35
	97.5%					10.40	10.40
Valle Colombia	Mean	0.00	0.00	10.11	0.00	8.66	3.75
	SD	0.00	0.00	4.05	0.00	3.59	1.25
	2.5%	0.00	0.00	3.81	0.00	3.33	1.92
	25.0%	0.00	0.00	7.31	0.00	6.15	2.82
	50.0%	0.00	0.00	9.52	0.00	7.99	3.59
	75.0%	0.00	0.00	12.20	0.00	10.54	4.41
	97.5%	0.00	0.00	19.66	0.00	17.29	6.84
Valles Centrales	Mean	7.70	18.90	5.97	5.54	4.11	8.44
	SD	3.25	4.10	2.00	1.80	1.37	1.34
	2.5%	3.28	11.73	2.94	2.80	1.96	6.08
	25.0%	5.35	15.96	4.55	4.21	3.08	7.47
	50.0%	7.06	18.48	5.67	5.25	4.00	8.35
	75.0%	9.23	21.59	7.16	6.56	4.96	9.31
	97.5%	16.21	27.78	10.50	9.72	7.09	11.41

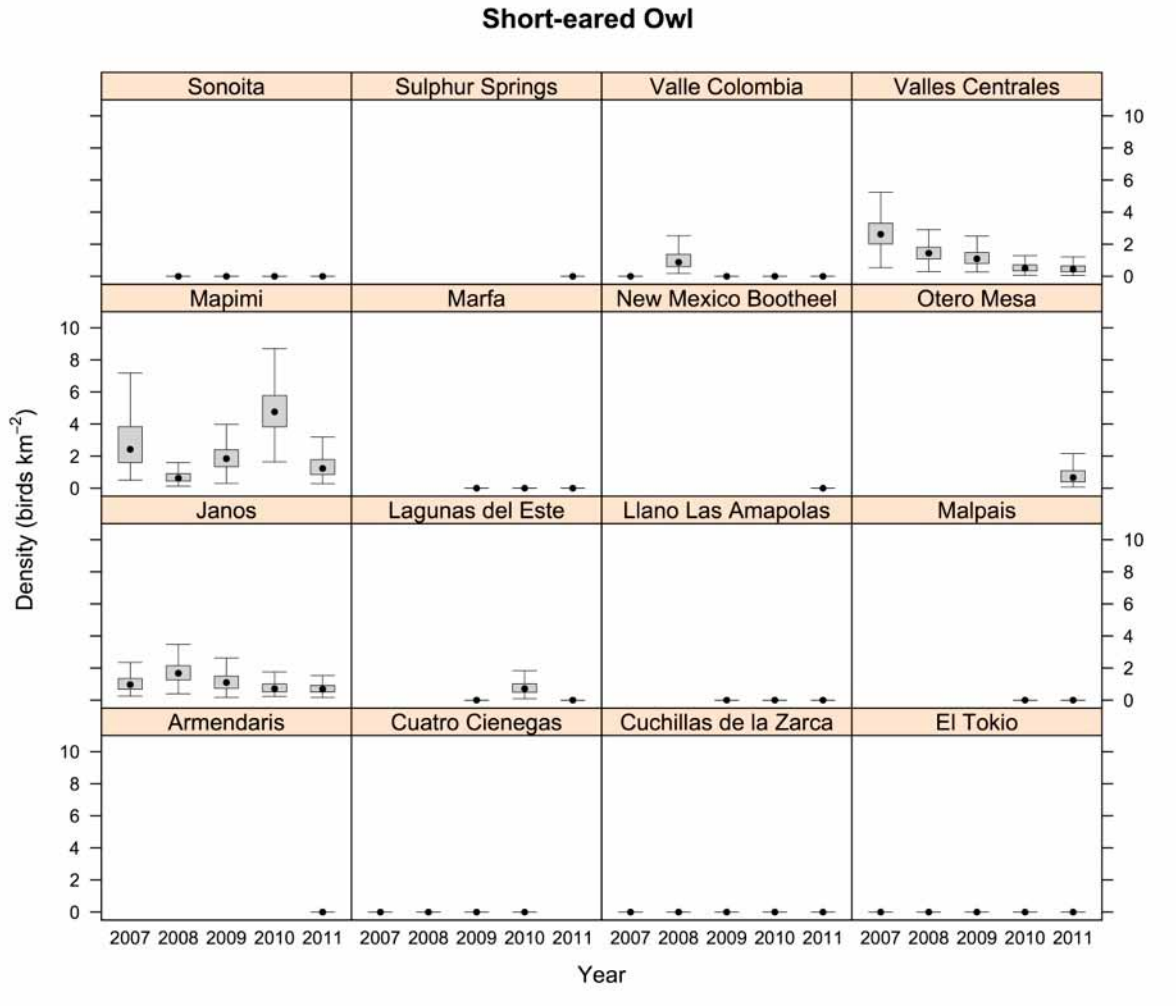

Scaled Quail
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0 5 10 15 20 25 30
2007 2008 2009 2010 2011
Year

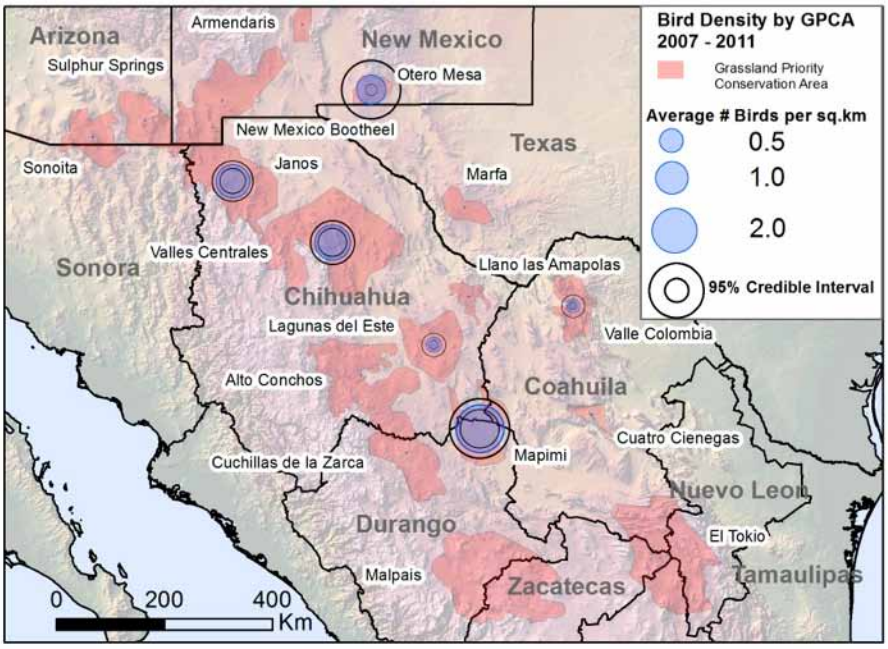

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0 200 400 Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
2.5
5.0
10
95% Credible Interval

Short-eared Owl (*n* = 60)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
El Tokio	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Janos	Mean	1.05	1.79	1.18	0.82	0.74	1.12
	SD	0.47	0.74	0.61	0.41	0.30	0.28
	2.5%	0.38	0.69	0.36	0.33	0.30	0.62
	25.0%	0.67	1.26	0.74	0.52	0.50	0.91
	50.0%	0.97	1.67	1.09	0.71	0.68	1.11
	75.0%	1.35	2.15	1.50	1.01	0.92	1.29
	97.5%	2.08	3.72	2.57	1.86	1.42	1.70
Lagunas del Este	Mean			0.00	0.79	0.00	0.26
	SD			0.00	0.41	0.00	0.14
	2.5%			0.00	0.21	0.00	0.07
	25.0%			0.00	0.49	0.00	0.16
	50.0%			0.00	0.71	0.00	0.24
	75.0%			0.00	1.03	0.00	0.34
	97.5%			0.00	1.77	0.00	0.59
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.00	0.00	0.00
	SD				0.00	0.00	0.00
	2.5%				0.00	0.00	0.00
	25.0%				0.00	0.00	0.00
	50.0%				0.00	0.00	0.00
	75.0%				0.00	0.00	0.00
	97.5%				0.00	0.00	0.00

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	2.88	0.73	1.93	4.90	1.41	2.37
	SD	1.78	0.40	0.82	1.46	0.76	0.54
	2.5%	0.71	0.28	0.58	2.62	0.48	1.48
	25.0%	1.60	0.44	1.34	3.83	0.85	1.99
	50.0%	2.42	0.63	1.84	4.76	1.23	2.31
	75.0%	3.84	0.91	2.39	5.78	1.78	2.69
	97.5%	7.00	1.80	3.75	8.24	3.30	3.60
Marfa	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
New Mexico Bootheel	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Otero Mesa	Mean					0.89	0.89
	SD					0.88	0.88
	2.5%					0.13	0.13
	25.0%					0.39	0.39
	50.0%					0.66	0.66
	75.0%					1.09	1.09
	97.5%					3.44	3.44
Sonoita	Mean		0.00	0.00	0.00	0.00	0.00
	SD		0.00	0.00	0.00	0.00	0.00
	2.5%		0.00	0.00	0.00	0.00	0.00
	25.0%		0.00	0.00	0.00	0.00	0.00
	50.0%		0.00	0.00	0.00	0.00	0.00
	75.0%		0.00	0.00	0.00	0.00	0.00
	97.5%		0.00	0.00	0.00	0.00	0.00
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	0.00	1.05	0.00	0.00	0.00	0.21
	SD	0.00	0.63	0.00	0.00	0.00	0.13
	2.5%	0.00	0.31	0.00	0.00	0.00	0.06
	25.0%	0.00	0.60	0.00	0.00	0.00	0.12
	50.0%	0.00	0.87	0.00	0.00	0.00	0.18
	75.0%	0.00	1.37	0.00	0.00	0.00	0.27
	97.5%	0.00	2.71	0.00	0.00	0.00	0.54
Valles Centrales	Mean	2.71	1.48	1.18	0.56	0.49	1.28
	SD	1.02	0.55	0.51	0.32	0.28	0.29
	2.5%	0.93	0.58	0.44	0.14	0.09	0.82
	25.0%	2.02	1.08	0.80	0.33	0.28	1.08
	50.0%	2.62	1.44	1.09	0.51	0.44	1.25
	75.0%	3.31	1.81	1.48	0.71	0.65	1.45
	97.5%	4.92	2.79	2.39	1.39	1.13	1.96

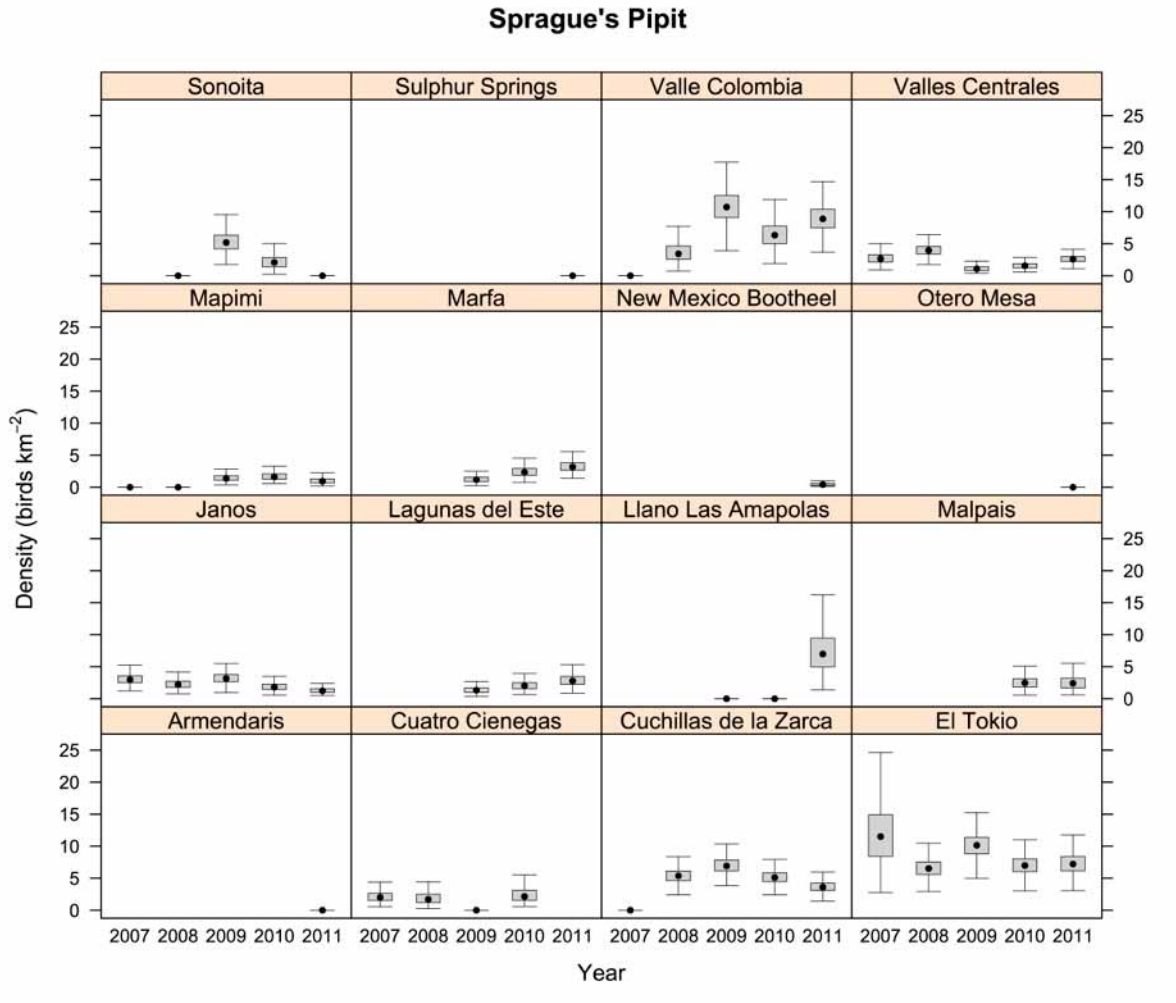

Short-eared Owl
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
2
4
6
8
10
2007 2008 2009 2010 2011
Year

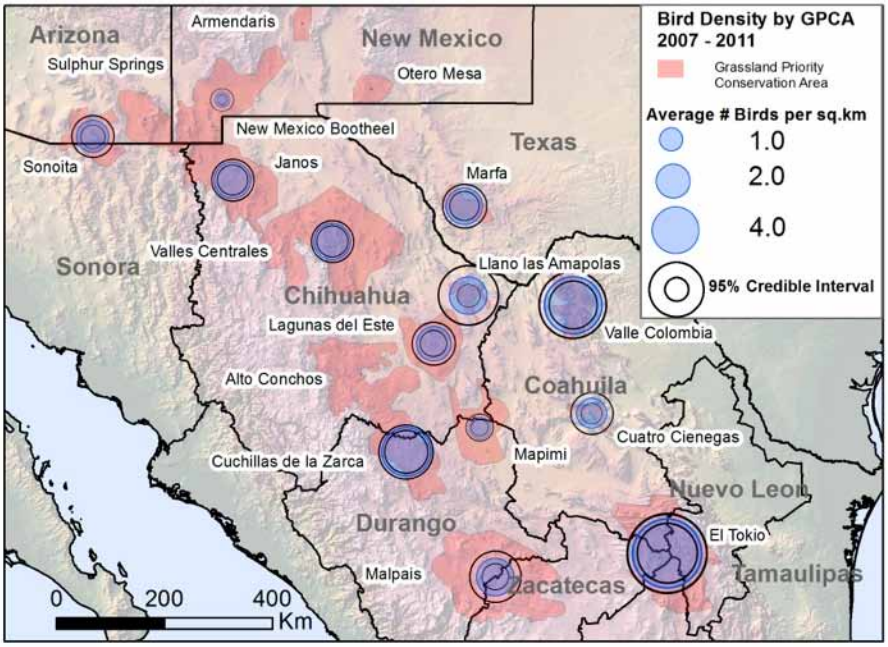

Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
0.5
1.0
2.0
95% Credible Interval

Sprague's Pipit (*n* = 393)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	2.19	1.99	0.00	2.50		1.67
	SD	0.93	1.11	0.00	1.33		0.63
	2.5%	0.90	0.56	0.00	0.89		0.81
	25.0%	1.51	1.20	0.00	1.52		1.20
	50.0%	2.01	1.71	0.00	2.15		1.55
	75.0%	2.65	2.50	0.00	3.12		2.01
	97.5%	4.57	4.88	0.00	6.03		3.16
Cuchillas de la Zarca	Mean	0.00	5.40	7.05	5.20	3.69	4.27
	SD	0.00	1.17	1.24	1.07	0.87	0.49
	2.5%	0.00	3.09	4.96	3.37	2.12	3.36
	25.0%	0.00	4.62	6.16	4.47	3.09	3.94
	50.0%	0.00	5.38	6.93	5.11	3.62	4.24
	75.0%	0.00	6.11	7.83	5.85	4.24	4.58
	97.5%	0.00	7.91	9.77	7.52	5.57	5.28
El Tokio	Mean	12.01	6.65	10.18	7.07	7.35	8.65
	SD	4.76	1.53	1.87	1.50	1.63	1.29
	2.5%	4.50	3.95	6.87	4.38	4.66	6.32
	25.0%	8.42	5.60	8.81	6.03	6.16	7.74
	50.0%	11.50	6.52	10.14	6.99	7.21	8.62
	75.0%	14.91	7.55	11.39	8.02	8.39	9.49
	97.5%	22.23	10.01	14.16	10.16	10.75	11.29
Janos	Mean	3.09	2.31	3.26	1.91	1.29	2.37
	SD	0.81	0.72	0.91	0.62	0.38	0.38
	2.5%	1.75	1.14	1.73	0.97	0.71	1.67
	25.0%	2.50	1.78	2.65	1.46	1.00	2.10
	50.0%	2.99	2.22	3.17	1.81	1.24	2.35
	75.0%	3.60	2.74	3.78	2.27	1.55	2.63
	97.5%	4.85	4.00	5.31	3.37	2.12	3.18
Lagunas del Este	Mean			1.38	2.09	2.93	2.13
	SD			0.54	0.72	0.92	0.52
	2.5%			0.52	0.92	1.45	1.19
	25.0%			1.00	1.56	2.25	1.77
	50.0%			1.33	2.03	2.79	2.07
	75.0%			1.68	2.52	3.48	2.45
	97.5%			2.61	3.75	5.13	3.26
Llano Las Amapolas	Mean			0.00	0.00	7.83	2.61
	SD			0.00	0.00	4.03	1.34
	2.5%			0.00	0.00	2.95	0.98
	25.0%			0.00	0.00	4.97	1.66
	50.0%			0.00	0.00	6.97	2.32
	75.0%			0.00	0.00	9.46	3.15
	97.5%			0.00	0.00	18.99	6.33
Malpaís	Mean				2.58	2.56	2.57
	SD				1.03	1.14	0.85
	2.5%				0.99	0.93	1.21
	25.0%				1.83	1.67	1.97
	50.0%				2.48	2.41	2.47
	75.0%				3.13	3.21	3.01
	97.5%				4.92	5.41	4.73

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	0.00	1.46	1.73	1.03	0.84
	SD	0.00	0.00	0.53	0.60	0.48	0.21
	2.5%	0.00	0.00	0.63	0.81	0.40	0.49
	25.0%	0.00	0.00	1.08	1.28	0.67	0.69
	50.0%	0.00	0.00	1.38	1.62	0.92	0.81
	75.0%	0.00	0.00	1.79	2.09	1.30	0.98
	97.5%	0.00	0.00	2.65	3.12	2.19	1.31
Marfa	Mean			1.27	2.45	3.29	2.34
	SD			0.55	0.79	0.86	0.52
	2.5%			0.44	1.23	1.93	1.51
	25.0%			0.90	1.88	2.65	1.96
	50.0%			1.17	2.34	3.19	2.28
	75.0%			1.54	2.94	3.83	2.65
	97.5%			2.46	4.31	5.22	3.54
New Mexico Bootheel	Mean					0.45	0.45
	SD					0.21	0.21
	2.5%					0.15	0.15
	25.0%					0.30	0.30
	50.0%					0.42	0.42
	75.0%					0.56	0.56
	97.5%					0.99	0.99
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	5.38	2.23	0.00	1.90
	SD		0.00	1.64	1.12	0.00	0.56
	2.5%		0.00	2.70	0.49	0.00	1.04
	25.0%		0.00	4.20	1.39	0.00	1.49
	50.0%		0.00	5.19	2.08	0.00	1.84
	75.0%		0.00	6.34	2.85	0.00	2.23
	97.5%		0.00	9.24	4.94	0.00	3.21
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	0.00	3.76	10.91	6.43	9.09	6.04
	SD	0.00	1.56	2.63	1.89	2.23	0.98
	2.5%	0.00	1.63	5.94	3.16	5.47	4.22
	25.0%	0.00	2.58	9.09	5.01	7.48	5.37
	50.0%	0.00	3.42	10.73	6.34	8.88	6.00
	75.0%	0.00	4.64	12.55	7.76	10.37	6.64
	97.5%	0.00	7.45	16.58	10.25	14.11	8.12
Valles Centrales	Mean	2.75	4.03	1.13	1.58	2.65	2.43
	SD	0.83	0.89	0.41	0.46	0.61	0.34
	2.5%	1.38	2.52	0.53	0.82	1.59	1.81
	25.0%	2.13	3.38	0.80	1.22	2.23	2.19
	50.0%	2.67	3.96	1.08	1.56	2.60	2.41
	75.0%	3.29	4.59	1.40	1.88	3.00	2.65
	97.5%	4.52	5.90	2.03	2.55	3.99	3.15

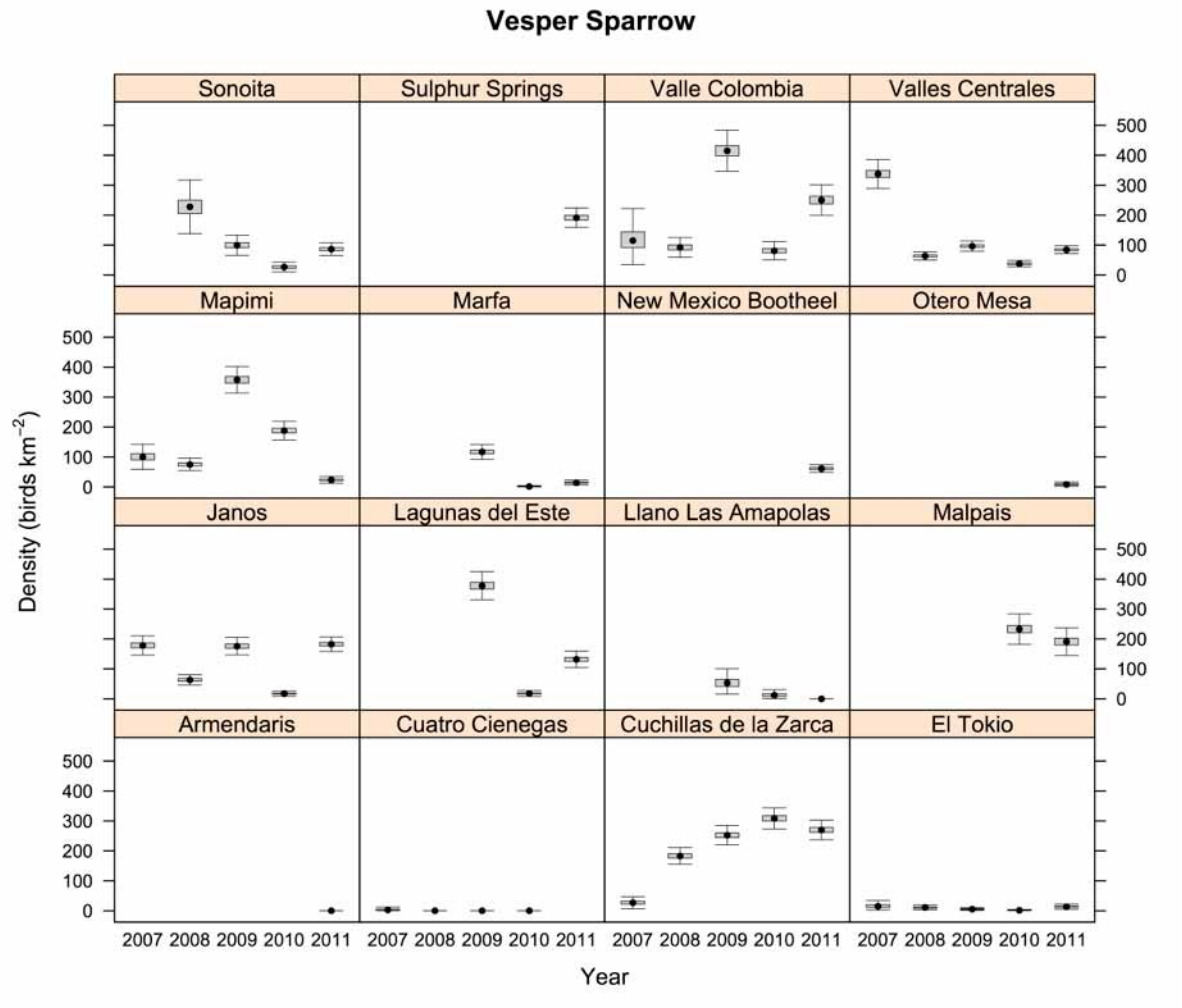

Sprague's Pipit
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
5
10
15
20
25
2007 2008 2009 2010 2011
Year

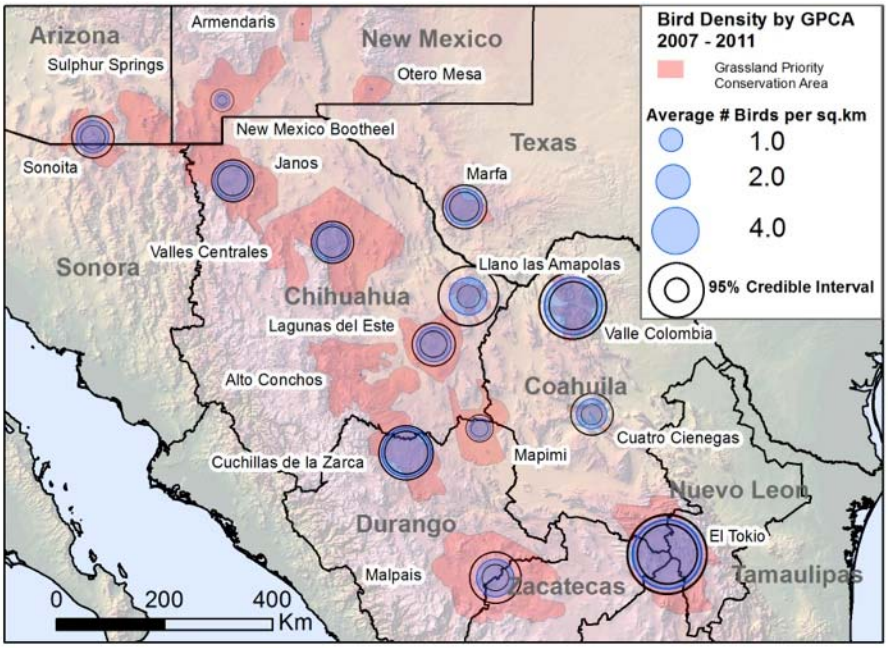

Arizona
Armendaris
New Mexico
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Texas
Sonoita
Janos
Marfa
Valles Centrales
Sonora
Llano las Amapolas
Chihuahua
Lagunas del Este
Valle Colombia
Alto Conchos
Coahuila
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
Nuevo Leon
Durango
El Tokio
Malpais
Zacatecas
Tamaulipas
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
1.0
2.0
4.0
95% Credible Interval

Vesper Sparrow (*n* = 7,442)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	3.82	0.00	0.00	0.00		0.96
	SD	3.47	0.00	0.00	0.00		0.87
	2.5%	0.23	0.00	0.00	0.00		0.06
	25.0%	1.20	0.00	0.00	0.00		0.30
	50.0%	2.70	0.00	0.00	0.00		0.67
	75.0%	5.49	0.00	0.00	0.00		1.37
	97.5%	12.84	0.00	0.00	0.00		3.21
Cuchillas de la Zarca	Mean	27.24	183.20	252.40	308.80	270.16	208.36
	SD	7.31	10.18	11.88	12.93	12.12	5.26
	2.5%	13.95	163.60	229.80	284.20	247.20	198.31
	25.0%	22.12	176.20	244.20	299.80	261.80	204.78
	50.0%	26.85	183.00	252.10	308.50	269.90	208.27
	75.0%	32.19	190.00	260.30	317.50	278.20	211.85
	97.5%	42.05	203.60	276.40	334.80	294.50	218.94
El Tokio	Mean	17.04	11.10	5.69	1.73	13.68	9.85
	SD	9.99	3.15	2.24	0.90	3.36	2.33
	2.5%	3.89	5.75	2.54	0.54	8.00	6.26
	25.0%	11.20	8.74	4.21	1.04	11.22	8.24
	50.0%	14.99	10.96	5.22	1.52	13.45	9.52
	75.0%	20.35	13.18	6.69	2.28	15.77	11.06
	97.5%	47.33	17.49	11.31	3.88	21.16	15.60
Janos	Mean	178.32	63.40	175.85	17.63	182.55	123.55
	SD	11.83	6.39	10.84	3.29	8.96	4.05
	2.5%	156.20	51.80	155.10	11.96	165.50	115.74
	25.0%	170.10	58.86	168.40	15.31	176.40	120.79
	50.0%	178.00	63.15	175.60	17.39	182.40	123.53
	75.0%	186.20	67.59	183.10	19.71	188.50	126.26
	97.5%	202.40	76.77	197.70	24.63	200.60	131.53
Lagunas del Este	Mean			378.18	18.04	132.03	176.09
	SD			17.36	3.58	10.29	6.95
	2.5%			345.30	11.68	112.90	162.93
	25.0%			366.30	15.45	124.90	171.33
	50.0%			377.80	17.92	131.80	175.92
	75.0%			389.70	20.30	138.70	180.70
	97.5%			413.50	25.59	153.10	190.05
Llano Las Amapolas	Mean			54.44	13.32	0.00	22.59
	SD			18.92	7.37	0.00	7.46
	2.5%			22.81	2.39	0.00	9.85
	25.0%			41.30	8.14	0.00	17.10
	50.0%			53.14	12.04	0.00	22.21
	75.0%			64.95	17.04	0.00	27.22
	97.5%			97.20	31.83	0.00	38.42
Malpaís	Mean				233.24	191.56	212.40
	SD				18.80	17.18	12.72
	2.5%				198.20	159.60	188.60
	25.0%				220.30	179.70	203.65
	50.0%				232.80	191.10	211.95
	75.0%				245.60	202.70	220.80
	97.5%				271.50	227.10	238.50

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	101.20	75.21	358.26	188.25	23.62	149.31
	SD	15.64	7.63	16.19	11.40	4.30	5.40
	2.5%	73.28	61.36	327.40	166.60	15.64	139.06
	25.0%	90.22	69.86	347.00	180.30	20.61	145.60
	50.0%	99.96	74.80	358.00	188.10	23.35	149.16
	75.0%	111.20	80.17	369.10	195.90	26.40	152.92
	97.5%	134.60	91.36	390.60	211.10	32.58	160.20
Marfa	Mean			116.95	1.59	14.15	44.23
	SD			9.02	1.07	3.02	3.15
	2.5%			100.00	0.14	9.28	38.29
	25.0%			110.60	0.78	11.95	42.02
	50.0%			116.70	1.36	13.78	44.19
	75.0%			123.10	2.17	16.04	46.37
	97.5%			135.10	4.14	20.76	50.50
New Mexico Bootheel	Mean					61.23	61.23
	SD					4.66	4.66
	2.5%					52.30	52.30
	25.0%					58.06	58.06
	50.0%					61.17	61.17
	75.0%					64.34	64.34
	97.5%					70.45	70.45
Otero Mesa	Mean					8.50	8.50
	SD					3.21	3.21
	2.5%					3.59	3.59
	25.0%					6.11	6.11
	50.0%					8.01	8.01
	75.0%					10.44	10.44
	97.5%					16.06	16.06
Sonoita	Mean		228.18	99.64	26.88	86.61	110.33
	SD		33.00	12.42	5.97	7.76	9.35
	2.5%		165.00	76.70	15.83	72.04	92.51
	25.0%		205.10	91.11	22.77	81.25	103.86
	50.0%		227.70	99.34	26.61	86.40	110.30
	75.0%		249.90	107.90	30.81	91.71	116.59
	97.5%		295.20	124.70	39.00	102.50	128.84
Sulphur Springs	Mean					191.73	191.73
	SD					12.36	12.36
	2.5%					168.30	168.30
	25.0%					183.40	183.40
	50.0%					191.50	191.50
	75.0%					199.70	199.70
	97.5%					216.90	216.90
Valle Colombia	Mean	118.95	92.40	415.29	81.07	250.44	191.63
	SD	38.53	11.76	25.54	11.08	18.75	10.68
	2.5%	54.54	71.13	367.00	60.82	214.70	171.98
	25.0%	91.45	83.87	397.80	73.40	237.50	184.21
	50.0%	115.00	91.97	414.70	80.45	250.10	191.23
	75.0%	143.80	100.40	432.10	88.39	263.10	198.61
	97.5%	203.80	116.40	466.80	104.10	287.80	213.71
Valles Centrales	Mean	338.06	63.68	96.48	37.86	84.61	124.14
	SD	17.84	5.35	6.35	3.94	5.09	4.23
	2.5%	304.10	53.43	84.41	30.46	74.89	116.03
	25.0%	325.80	60.11	92.15	35.14	81.21	121.22
	50.0%	337.80	63.54	96.36	37.67	84.58	124.08
	75.0%	350.00	67.16	100.70	40.43	87.92	126.96
	97.5%	373.60	74.54	109.20	45.97	94.84	132.69

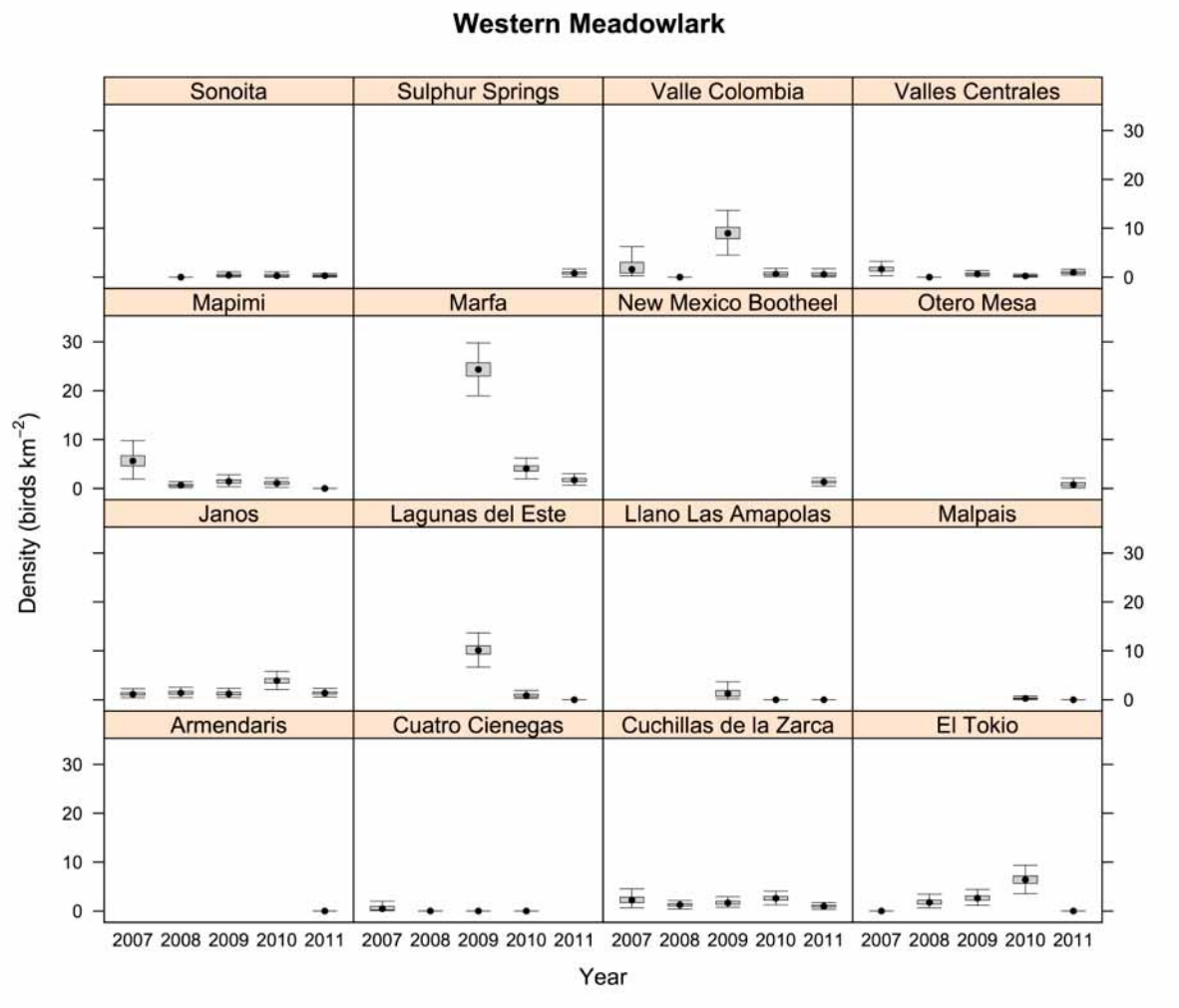

Vesper Sparrow
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
100
200
300
400
500
2007 2008 2009 2010 2011
Year

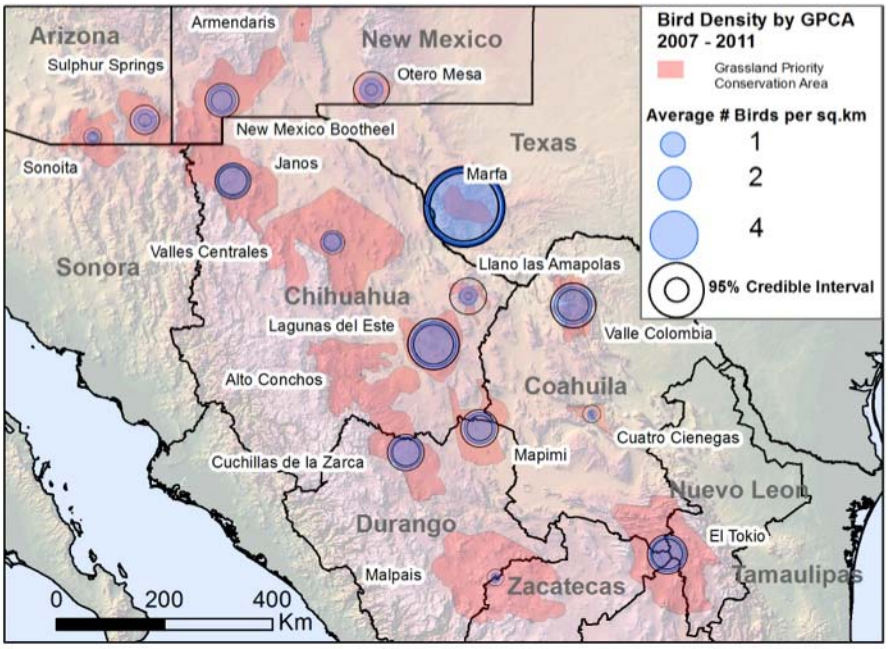

Arizona
Armendaris
New Mexico
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Texas
Sonoita
Janos
Marfa
Valles Centrales
Sonora
Llano las Amapolas
Chihuahua
Lagunas del Este
Valle Colombia
Alto Conchos
Coahuila
Cuatro Cienegas
Cuchillas de la Zarca
Mapimi
Nuevo Leon
Durango
El Tokio
Malpais
Zacatecas
Tamaulipas
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
1.0
2.0
4.0
95% Credible Interval

Western Meadowlark (*n* = 601)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.67	0.00	0.00	0.00		0.17
	SD	0.57	0.00	0.00	0.00		0.14
	2.5%	0.12	0.00	0.00	0.00		0.03
	25.0%	0.24	0.00	0.00	0.00		0.06
	50.0%	0.47	0.00	0.00	0.00		0.12
	75.0%	0.95	0.00	0.00	0.00		0.24
	97.5%	2.19	0.00	0.00	0.00		0.55
Cuchillas de la Zarca	Mean	2.36	1.28	1.73	2.65	1.01	1.80
	SD	0.89	0.36	0.46	0.57	0.28	0.27
	2.5%	1.02	0.64	1.00	1.71	0.53	1.34
	25.0%	1.73	1.04	1.39	2.25	0.80	1.61
	50.0%	2.23	1.27	1.68	2.60	0.98	1.78
	75.0%	2.84	1.49	2.01	2.98	1.18	1.97
	97.5%	4.55	2.04	2.73	3.93	1.62	2.40
El Tokio	Mean	0.00	1.87	2.71	6.44	0.00	2.20
	SD	0.00	0.58	0.70	1.07	0.00	0.29
	2.5%	0.00	0.99	1.65	4.52	0.00	1.66
	25.0%	0.00	1.42	2.21	5.67	0.00	2.00
	50.0%	0.00	1.77	2.63	6.40	0.00	2.20
	75.0%	0.00	2.24	3.10	7.16	0.00	2.40
	97.5%	0.00	3.19	4.30	8.61	0.00	2.78
Janos	Mean	1.22	1.43	1.25	3.92	1.40	1.84
	SD	0.39	0.43	0.39	0.67	0.33	0.22
	2.5%	0.62	0.70	0.63	2.71	0.83	1.44
	25.0%	0.93	1.12	0.95	3.44	1.16	1.70
	50.0%	1.15	1.41	1.22	3.89	1.38	1.83
	75.0%	1.46	1.70	1.51	4.38	1.61	1.97
	97.5%	2.08	2.36	2.08	5.27	2.10	2.32
Lagunas del Este	Mean			10.21	0.88	0.00	3.70
	SD			1.31	0.36	0.00	0.46
	2.5%			7.84	0.30	0.00	2.87
	25.0%			9.30	0.61	0.00	3.38
	50.0%			10.13	0.88	0.00	3.68
	75.0%			11.06	1.13	0.00	3.99
	97.5%			12.98	1.62	0.00	4.65
Llano Las Amapolas	Mean			1.64	0.00	0.00	0.55
	SD			1.55	0.00	0.00	0.52
	2.5%			0.28	0.00	0.00	0.09
	25.0%			0.70	0.00	0.00	0.23
	50.0%			1.25	0.00	0.00	0.42
	75.0%			1.89	0.00	0.00	0.63
	97.5%			7.05	0.00	0.00	2.35
Malpaís	Mean				0.34	0.00	0.17
	SD				0.23	0.00	0.11
	2.5%				0.09	0.00	0.04
	25.0%				0.19	0.00	0.09
	50.0%				0.27	0.00	0.13
	75.0%				0.42	0.00	0.21
	97.5%				0.98	0.00	0.49

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	5.78	0.67	1.46	1.11	0.00	1.81
	SD	1.68	0.26	0.51	0.38	0.00	0.37
	2.5%	3.01	0.24	0.58	0.38	0.00	1.15
	25.0%	4.62	0.49	1.10	0.85	0.00	1.56
	50.0%	5.63	0.66	1.43	1.11	0.00	1.78
	75.0%	6.69	0.83	1.78	1.35	0.00	2.03
	97.5%	9.80	1.24	2.54	1.94	0.00	2.59
Marfa	Mean			24.38	4.12	1.76	10.09
	SD			2.02	0.80	0.49	0.77
	2.5%			20.53	2.69	0.97	8.64
	25.0%			23.00	3.56	1.40	9.56
	50.0%			24.34	4.07	1.71	10.06
	75.0%			25.71	4.63	2.05	10.60
	97.5%			28.53	5.75	2.86	11.67
New Mexico Bootheel	Mean					1.34	1.34
	SD					0.32	0.32
	2.5%					0.75	0.75
	25.0%					1.11	1.11
	50.0%					1.32	1.32
	75.0%					1.55	1.55
	97.5%					2.03	2.03
Otero Mesa	Mean					0.91	0.91
	SD					0.52	0.52
	2.5%					0.23	0.23
	25.0%					0.53	0.53
	50.0%					0.78	0.78
	75.0%					1.17	1.17
	97.5%					2.25	2.25
Sonoita	Mean		0.00	0.46	0.41	0.32	0.30
	SD		0.00	0.30	0.36	0.18	0.13
	2.5%		0.00	0.14	0.04	0.08	0.12
	25.0%		0.00	0.24	0.17	0.19	0.20
	50.0%		0.00	0.38	0.29	0.29	0.28
	75.0%		0.00	0.59	0.55	0.42	0.37
	97.5%		0.00	1.22	1.40	0.74	0.60
Sulphur Springs	Mean					0.83	0.83
	SD					0.32	0.32
	2.5%					0.30	0.30
	25.0%					0.61	0.61
	50.0%					0.80	0.80
	75.0%					1.03	1.03
	97.5%					1.51	1.51
Valle Colombia	Mean	2.18	0.00	9.12	0.75	0.67	2.54
	SD	1.67	0.00	1.67	0.43	0.42	0.46
	2.5%	0.43	0.00	6.25	0.21	0.16	1.75
	25.0%	0.87	0.00	7.91	0.41	0.34	2.22
	50.0%	1.61	0.00	8.99	0.68	0.57	2.51
	75.0%	3.00	0.00	10.20	0.97	0.88	2.83
	97.5%	6.48	0.00	12.70	1.80	1.73	3.55
Valles Centrales	Mean	1.67	0.00	0.67	0.27	0.99	0.72
	SD	0.56	0.00	0.23	0.14	0.25	0.13
	2.5%	0.74	0.00	0.30	0.09	0.56	0.48
	25.0%	1.25	0.00	0.49	0.16	0.81	0.63
	50.0%	1.65	0.00	0.65	0.24	0.97	0.71
	75.0%	2.04	0.00	0.83	0.35	1.14	0.80
	97.5%	2.84	0.00	1.14	0.59	1.53	1.00


Western Meadowlark
Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0
10
20
30
2007 2008 2009 2010 2011
Year

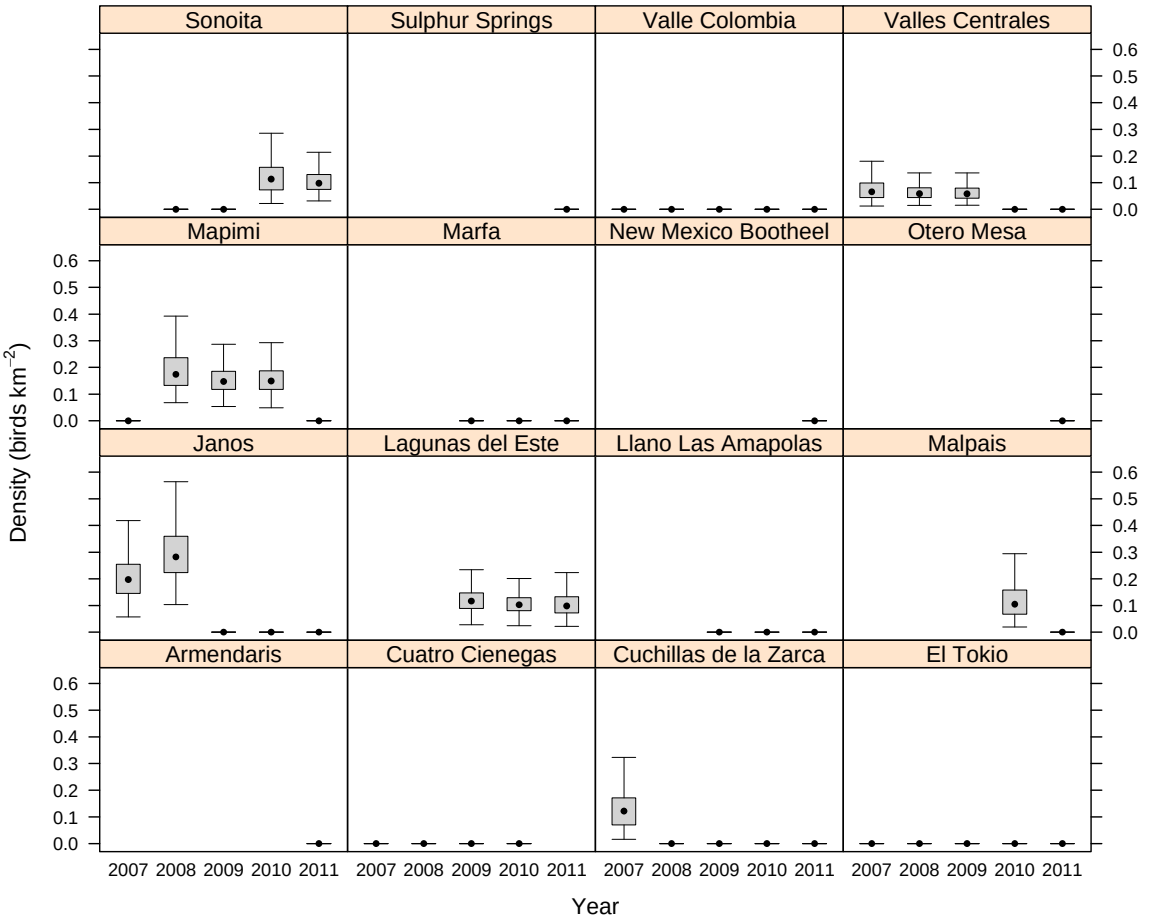

Arizona
Armendaris
New Mexico
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Texas
Sonoita
Janos
Marfa
Valles Centrales
Sonora
Llano las Amapolas
Chihuahua
Lagunas del Este
Valle Colombia
Alto Conchos
Coahuila
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
Nuevo Leon
Durango
El Tokio
Malpais
Zacatecas
Tamaulipas
0
200
400
Km
Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
1
2
4
95% Credible Interval

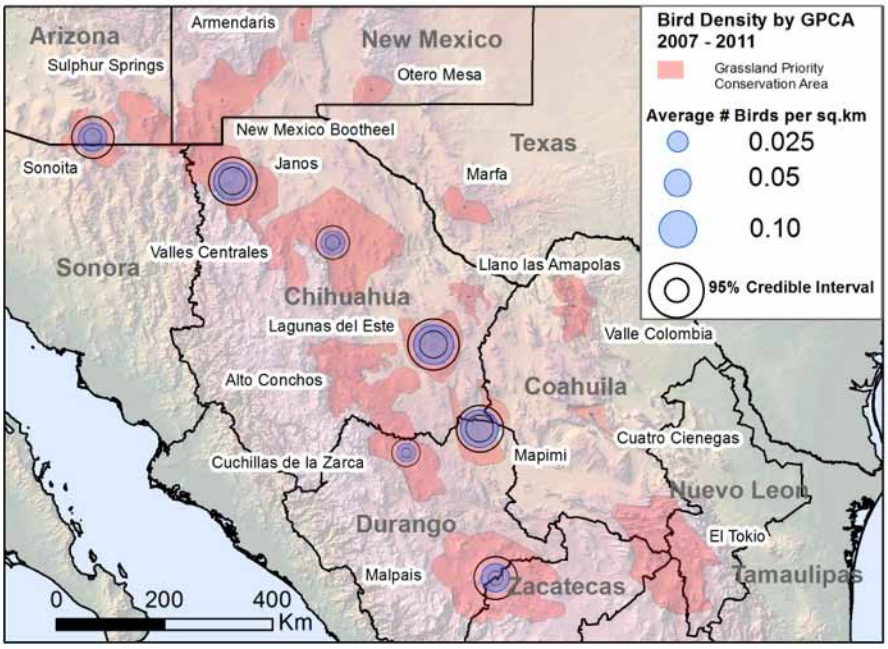
White-tailed Kite (*n* = 45)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Cuatro Ciénegas	Mean	0.00	0.00	0.00	0.00		0.00
	SD	0.00	0.00	0.00	0.00		0.00
	2.5%	0.00	0.00	0.00	0.00		0.00
	25.0%	0.00	0.00	0.00	0.00		0.00
	50.0%	0.00	0.00	0.00	0.00		0.00
	75.0%	0.00	0.00	0.00	0.00		0.00
	97.5%	0.00	0.00	0.00	0.00		0.00
Cuchillas de la Zarca	Mean	0.13	0.00	0.00	0.00	0.00	0.03
	SD	0.07	0.00	0.00	0.00	0.00	0.01
	2.5%	0.03	0.00	0.00	0.00	0.00	0.01
	25.0%	0.07	0.00	0.00	0.00	0.00	0.01
	50.0%	0.12	0.00	0.00	0.00	0.00	0.02
	75.0%	0.17	0.00	0.00	0.00	0.00	0.03
	97.5%	0.29	0.00	0.00	0.00	0.00	0.06
El Tokio	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Janos	Mean	0.21	0.30	0.00	0.00	0.00	0.10
	SD	0.08	0.10	0.00	0.00	0.00	0.03
	2.5%	0.08	0.14	0.00	0.00	0.00	0.05
	25.0%	0.15	0.22	0.00	0.00	0.00	0.08
	50.0%	0.20	0.28	0.00	0.00	0.00	0.10
	75.0%	0.25	0.36	0.00	0.00	0.00	0.12
	97.5%	0.39	0.53	0.00	0.00	0.00	0.16
Lagunas del Este	Mean			0.12	0.11	0.11	0.11
	SD			0.04	0.04	0.05	0.04
	2.5%			0.05	0.05	0.04	0.05
	25.0%			0.09	0.08	0.07	0.08
	50.0%			0.12	0.10	0.10	0.11
	75.0%			0.15	0.13	0.13	0.14
	97.5%			0.22	0.18	0.22	0.19
Llano Las Amapolas	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
Malpaís	Mean				0.12	0.00	0.06
	SD				0.06	0.00	0.03
	2.5%				0.03	0.00	0.02
	25.0%				0.07	0.00	0.03
	50.0%				0.10	0.00	0.05
	75.0%				0.16	0.00	0.08
	97.5%				0.26	0.00	0.13

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	0.00	0.19	0.16	0.16	0.00	0.10
	SD	0.00	0.07	0.05	0.06	0.00	0.03
	2.5%	0.00	0.09	0.08	0.07	0.00	0.05
	25.0%	0.00	0.13	0.12	0.12	0.00	0.08
	50.0%	0.00	0.17	0.15	0.15	0.00	0.10
	75.0%	0.00	0.24	0.19	0.19	0.00	0.12
	97.5%	0.00	0.35	0.28	0.29	0.00	0.16
Marfa	Mean			0.00	0.00	0.00	0.00
	SD			0.00	0.00	0.00	0.00
	2.5%			0.00	0.00	0.00	0.00
	25.0%			0.00	0.00	0.00	0.00
	50.0%			0.00	0.00	0.00	0.00
	75.0%			0.00	0.00	0.00	0.00
	97.5%			0.00	0.00	0.00	0.00
New Mexico Bootheel	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Otero Mesa	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Sonoita	Mean		0.00	0.00	0.13	0.11	0.06
	SD		0.00	0.00	0.07	0.05	0.03
	2.5%		0.00	0.00	0.04	0.05	0.02
	25.0%		0.00	0.00	0.07	0.08	0.04
	50.0%		0.00	0.00	0.11	0.10	0.05
	75.0%		0.00	0.00	0.16	0.13	0.07
	97.5%		0.00	0.00	0.30	0.23	0.13
Sulphur Springs	Mean					0.00	0.00
	SD					0.00	0.00
	2.5%					0.00	0.00
	25.0%					0.00	0.00
	50.0%					0.00	0.00
	75.0%					0.00	0.00
	97.5%					0.00	0.00
Valle Colombia	Mean	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00
	2.5%	0.00	0.00	0.00	0.00	0.00	0.00
	25.0%	0.00	0.00	0.00	0.00	0.00	0.00
	50.0%	0.00	0.00	0.00	0.00	0.00	0.00
	75.0%	0.00	0.00	0.00	0.00	0.00	0.00
	97.5%	0.00	0.00	0.00	0.00	0.00	0.00
Valles Centrales	Mean	0.08	0.07	0.06	0.00	0.00	0.04
	SD	0.04	0.03	0.03	0.00	0.00	0.02
	2.5%	0.02	0.03	0.03	0.00	0.00	0.02
	25.0%	0.04	0.04	0.04	0.00	0.00	0.03
	50.0%	0.07	0.06	0.06	0.00	0.00	0.04
	75.0%	0.10	0.08	0.08	0.00	0.00	0.05
	97.5%	0.18	0.14	0.12	0.00	0.00	0.08

White-tailed Kite



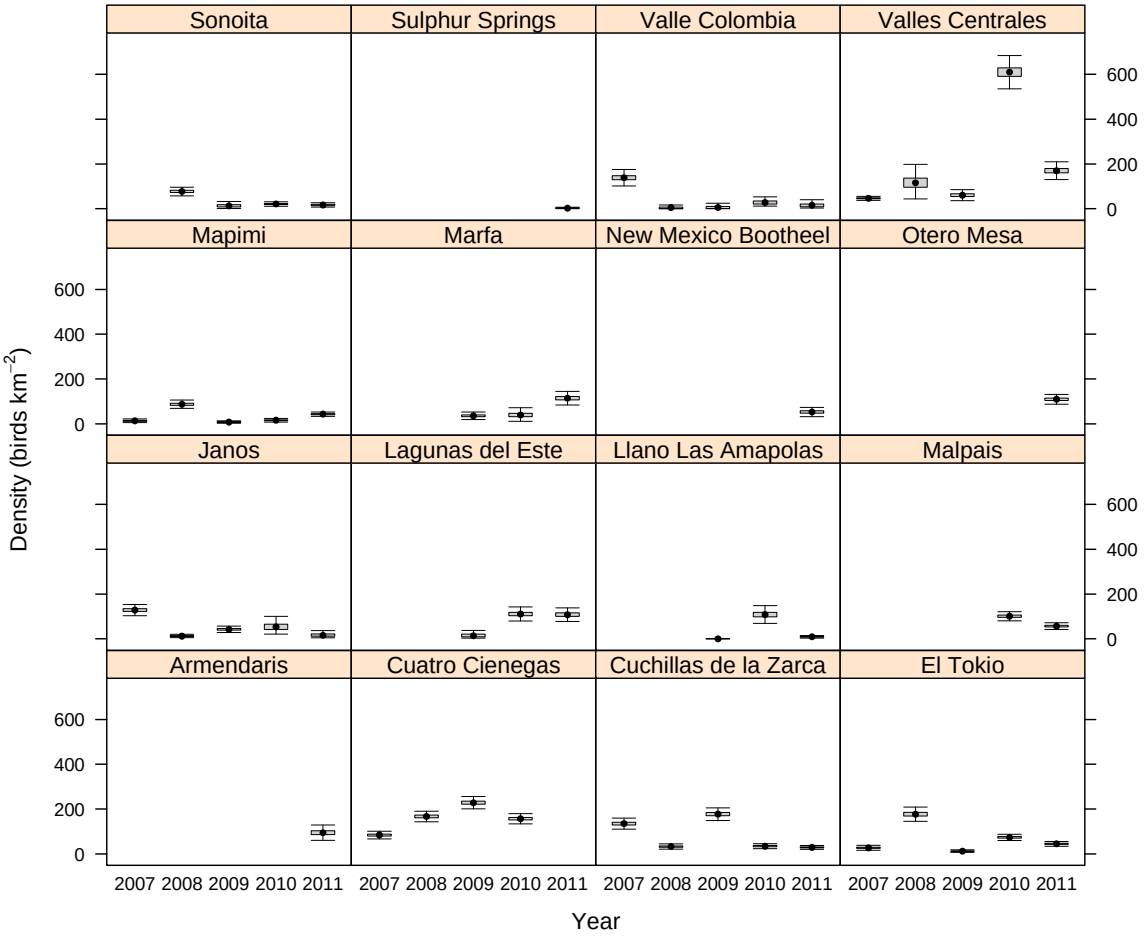


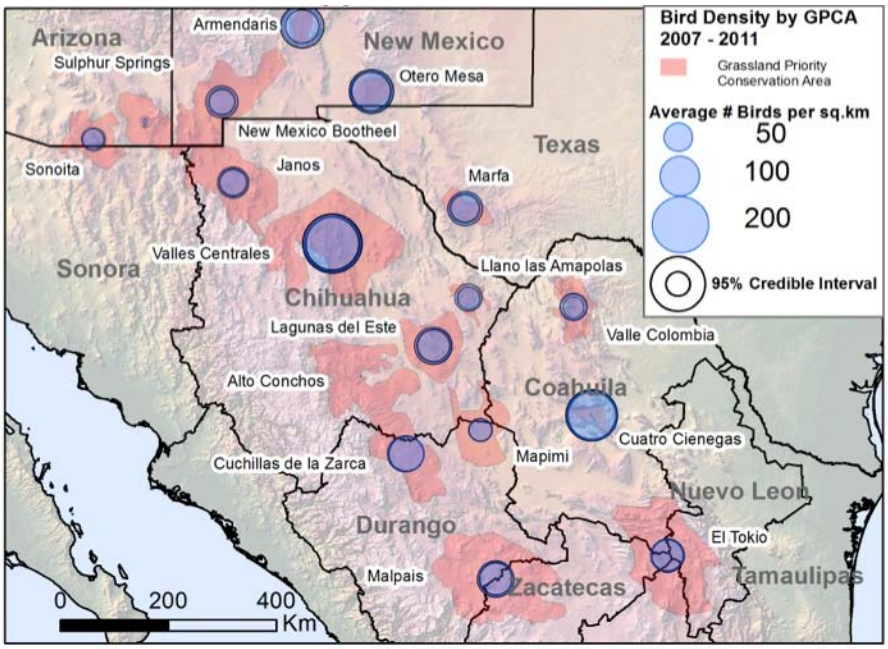
Ammodramus-Passerculus (*n* = 5,609)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					95.16	95.16
	SD					12.85	12.85
	2.5%					72.18	72.18
	25.0%					86.23	86.23
	50.0%					94.30	94.30
	75.0%					103.40	103.40
	97.5%					121.70	121.70
Cuatro Ciénegas	Mean	84.26	166.98	228.42	157.29		159.24
	SD	6.35	8.96	10.28	8.37		4.43
	2.5%	72.47	149.50	208.80	141.30		150.70
	25.0%	79.82	161.00	221.40	151.50		156.25
	50.0%	84.13	167.00	228.20	157.10		159.20
	75.0%	88.50	172.90	235.30	162.80		162.22
	97.5%	97.13	184.80	248.90	174.20		167.94
Cuchillas de la Zarca	Mean	135.38	32.84	177.68	34.69	29.01	81.92
	SD	9.18	4.25	10.36	4.21	3.07	3.15
	2.5%	117.80	24.89	158.00	27.20	23.34	75.88
	25.0%	129.10	29.90	170.50	31.73	26.89	79.76
	50.0%	135.20	32.75	177.50	34.44	28.88	81.88
	75.0%	141.40	35.64	184.60	37.35	31.04	83.99
	97.5%	154.10	41.65	198.50	43.45	35.35	88.27
El Tokio	Mean	27.24	177.42	12.33	73.98	45.01	67.20
	SD	4.32	11.80	2.01	5.06	3.87	2.85
	2.5%	19.61	154.90	8.66	64.56	37.67	61.80
	25.0%	24.27	169.30	10.91	70.49	42.34	65.20
	50.0%	26.92	177.20	12.23	73.78	44.97	67.12
	75.0%	29.86	185.20	13.65	77.30	47.63	69.11
	97.5%	36.78	201.40	16.54	84.36	52.69	72.92
Janos	Mean	128.48	12.40	42.56	55.54	18.55	51.50
	SD	9.21	2.96	5.41	17.72	9.59	4.99
	2.5%	111.00	7.50	32.50	28.43	6.93	42.78
	25.0%	122.20	10.28	38.78	42.40	12.10	47.91
	50.0%	128.40	12.05	42.45	53.48	15.97	51.16
	75.0%	134.60	14.22	46.12	65.56	22.19	54.71
	97.5%	146.90	18.95	53.72	97.44	45.45	62.35
Lagunas del Este	Mean			16.26	111.01	108.17	78.48
	SD			9.44	11.41	11.36	6.28
	2.5%			4.97	89.51	87.32	66.87
	25.0%			9.14	103.10	100.30	74.11
	50.0%			13.97	110.70	107.70	78.18
	75.0%			20.66	118.70	115.60	82.61
	97.5%			41.65	133.80	131.30	91.57
Llano Las Amapolas	Mean			0.00	108.37	9.11	39.16
	SD			0.00	14.56	2.17	4.94
	2.5%			0.00	80.86	5.19	29.78
	25.0%			0.00	98.26	7.51	35.75
	50.0%			0.00	108.30	9.13	39.05
	75.0%			0.00	118.20	10.54	42.50
	97.5%			0.00	137.50	13.53	49.05
Malpaís	Mean				101.06	56.78	78.92
	SD				7.58	5.53	4.74
	2.5%				86.91	46.19	69.97
	25.0%				95.85	53.02	75.62
	50.0%				100.80	56.66	78.80
	75.0%				106.00	60.47	82.10
	97.5%				116.80	67.87	88.51

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	13.62	87.57	8.01	16.02	43.30	33.70
	SD	3.01	6.95	2.18	3.12	3.55	1.85
	2.5%	8.26	74.62	4.30	10.24	36.80	30.11
	25.0%	11.52	82.85	6.45	13.91	40.84	32.46
	50.0%	13.47	87.33	7.90	15.87	43.15	33.70
	75.0%	15.53	91.98	9.30	17.97	45.64	34.91
	97.5%	19.97	102.10	12.81	22.75	50.59	37.41
Marfa	Mean			36.06	39.90	114.43	63.46
	SD			6.24	12.25	11.37	5.86
	2.5%			24.51	18.27	93.19	52.80
	25.0%			31.79	31.38	106.60	59.40
	50.0%			35.72	39.23	114.10	63.15
	75.0%			40.12	47.38	121.90	67.17
	97.5%			49.02	66.55	137.80	75.78
New Mexico Bootheel	Mean					53.12	53.12
	SD					7.72	7.72
	2.5%					39.11	39.11
	25.0%					47.79	47.79
	50.0%					52.60	52.60
	75.0%					58.04	58.04
	97.5%					69.81	69.81
Otero Mesa	Mean					109.69	109.69
	SD					8.00	8.00
	2.5%					94.40	94.40
	25.0%					104.20	104.20
	50.0%					109.60	109.60
	75.0%					115.10	115.10
	97.5%					125.40	125.40
Sonoita	Mean		77.42	13.88	21.43	17.20	32.48
	SD		7.27	6.91	3.86	3.49	2.78
	2.5%		64.49	2.75	14.27	10.99	27.45
	25.0%		72.37	8.58	18.83	14.73	30.58
	50.0%		77.02	13.29	21.25	17.00	32.34
	75.0%		81.99	18.23	23.76	19.47	34.21
	97.5%		92.84	29.16	29.83	24.72	38.50
Sulphur Springs	Mean					3.22	3.22
	SD					1.42	1.42
	2.5%					1.14	1.14
	25.0%					2.20	2.20
	50.0%					2.94	2.94
	75.0%					3.97	3.97
	97.5%					6.76	6.76
Valle Colombia	Mean	138.66	5.46	6.78	28.67	15.70	39.05
	SD	13.63	4.92	5.99	9.09	7.75	5.03
	2.5%	112.60	0.50	0.42	13.93	4.47	29.48
	25.0%	129.30	0.91	1.27	21.60	9.15	35.25
	50.0%	138.30	5.14	5.72	27.75	15.53	39.18
	75.0%	147.70	7.48	10.78	34.27	21.57	42.67
	97.5%	165.70	19.41	19.80	49.10	31.16	48.62
Valles Centrales	Mean	46.96	117.77	61.05	610.19	170.20	201.23
	SD	3.42	29.83	8.95	27.44	14.66	9.17
	2.5%	40.37	66.06	45.06	558.00	142.80	184.58
	25.0%	44.65	96.11	54.62	591.30	160.20	194.82
	50.0%	46.90	116.20	60.47	609.70	169.70	200.84
	75.0%	49.19	136.80	66.94	628.50	179.90	207.15
	97.5%	53.92	183.30	79.86	665.70	200.20	220.31

Ammodramus-Passerculus



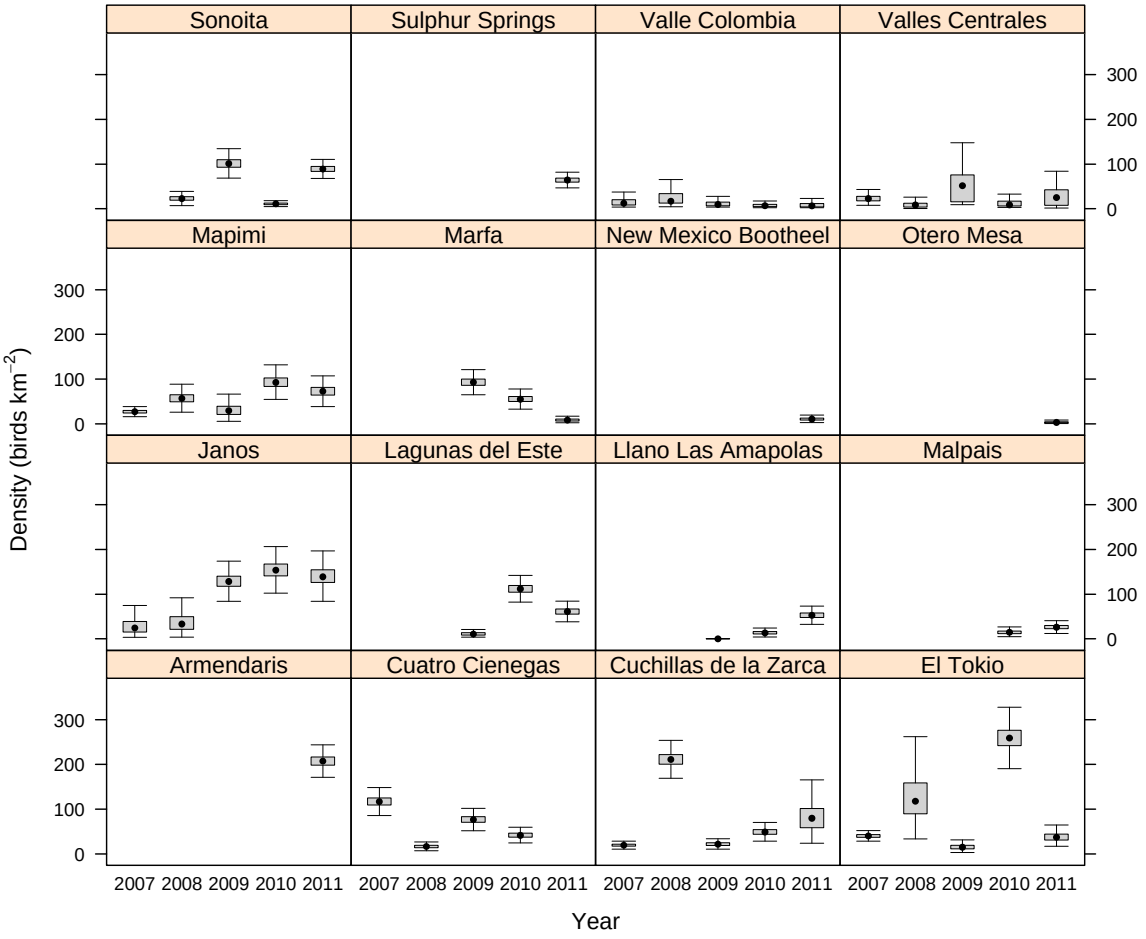


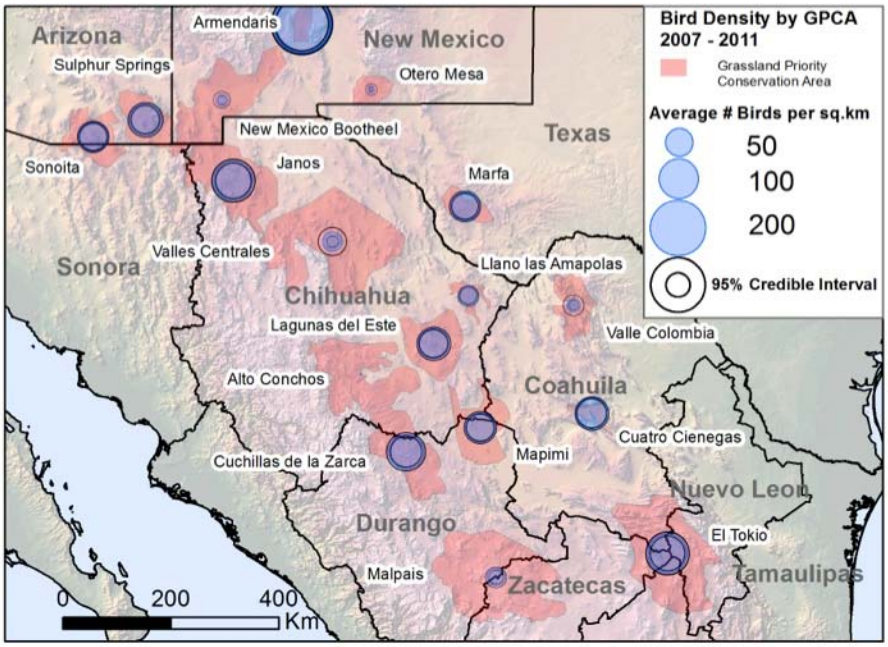
Ammodramus spp. (*n* = 2,582)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					207.58	207.58
	SD					13.65	13.65
	2.5%					181.10	181.10
	25.0%					198.40	198.40
	50.0%					207.40	207.40
	75.0%					216.60	216.60
	97.5%					234.70	234.70
Cuatro Ciénegas	Mean	117.33	16.69	77.20	41.99		63.30
	SD	11.75	3.87	9.60	6.35		4.20
	2.5%	95.87	10.05	59.60	30.75		55.27
	25.0%	109.30	13.95	70.60	37.35		60.43
	50.0%	116.80	16.56	76.74	41.54		63.22
	75.0%	124.90	19.09	83.24	46.22		66.03
	97.5%	141.50	24.64	97.65	55.18		71.93
Cuchillas de la Zarca	Mean	19.67	211.62	22.11	49.52	83.60	77.30
	SD	3.35	15.95	4.52	7.61	32.67	7.41
	2.5%	13.62	181.30	14.83	36.17	37.09	65.25
	25.0%	17.35	200.80	18.84	44.05	58.56	72.14
	50.0%	19.50	211.20	21.67	49.00	79.76	76.38
	75.0%	21.78	222.10	24.84	54.46	101.30	81.52
	97.5%	26.79	244.00	32.15	65.94	162.40	94.89
El Tokio	Mean	40.40	127.11	15.84	259.52	38.40	96.25
	SD	4.37	48.03	6.39	25.28	10.06	11.13
	2.5%	32.48	56.72	5.83	211.30	22.56	77.10
	25.0%	37.31	89.59	11.16	242.10	30.93	88.22
	50.0%	40.21	117.80	14.95	259.00	37.18	95.22
	75.0%	43.19	158.60	19.28	276.50	44.39	103.50
	97.5%	49.50	232.70	31.38	310.20	60.37	120.10
Janos	Mean	29.72	38.45	129.33	154.53	140.77	98.56
	SD	21.10	23.41	17.38	19.76	21.62	9.52
	2.5%	5.55	7.60	97.73	117.20	102.20	81.43
	25.0%	15.30	21.53	117.60	141.10	126.10	92.11
	50.0%	24.36	33.15	128.20	153.70	138.80	98.03
	75.0%	39.01	49.62	140.10	167.20	154.30	104.48
	97.5%	85.77	96.76	166.40	195.80	187.90	118.72
Lagunas del Este	Mean			11.27	112.10	61.30	61.56
	SD			3.64	11.29	8.39	4.78
	2.5%			5.27	90.72	45.95	52.48
	25.0%			8.58	104.40	55.29	58.23
	50.0%			10.86	111.70	61.11	61.45
	75.0%			13.56	119.40	66.93	64.75
	97.5%			19.20	135.60	78.50	71.20
Llano Las Amapolas	Mean			0.00	13.80	53.06	22.29
	SD			0.00	3.97	7.79	2.84
	2.5%			0.00	7.37	38.80	17.12
	25.0%			0.00	10.98	47.75	20.41
	50.0%			0.00	13.43	52.67	22.12
	75.0%			0.00	16.18	57.91	24.01
	97.5%			0.00	22.81	69.30	28.19
Malpaís	Mean				14.99	26.45	20.72
	SD				4.24	5.35	3.36
	2.5%				7.96	16.93	14.49
	25.0%				11.80	22.69	18.40
	50.0%				14.70	26.13	20.64
	75.0%				17.72	29.81	22.91
	97.5%				24.10	37.87	27.75

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	27.24	57.36	31.34	93.39	73.56	56.58
	SD	4.15	11.33	14.92	14.14	13.16	5.10
	2.5%	20.01	37.04	9.92	68.41	50.22	46.94
	25.0%	24.26	49.29	20.86	83.43	64.40	53.11
	50.0%	27.02	56.85	29.55	92.56	72.66	56.48
	75.0%	29.90	65.01	39.05	102.70	81.60	59.88
	97.5%	35.97	80.46	68.44	122.30	102.60	67.20
Marfa	Mean			93.22	55.57	8.96	52.58
	SD			10.46	8.25	3.43	4.73
	2.5%			73.37	40.63	3.94	43.58
	25.0%			86.07	49.66	6.47	49.32
	50.0%			92.86	55.10	8.43	52.46
	75.0%			100.10	61.01	10.77	55.77
	97.5%			114.60	72.70	17.54	62.14
New Mexico Bootheel	Mean					10.79	10.79
	SD					3.47	3.47
	2.5%					4.29	4.29
	25.0%					8.36	8.36
	50.0%					10.56	10.56
	75.0%					12.90	12.90
	97.5%					18.41	18.41
Otero Mesa	Mean					3.59	3.59
	SD					1.89	1.89
	2.5%					1.00	1.00
	25.0%					2.19	2.19
	50.0%					3.24	3.24
	75.0%					4.63	4.63
	97.5%					8.29	8.29
Sonoita	Mean		23.55	101.51	11.24	89.26	56.39
	SD		6.12	12.15	2.65	7.95	3.96
	2.5%		13.67	79.15	6.86	74.19	48.81
	25.0%		19.16	93.14	9.31	83.79	53.67
	50.0%		22.69	101.00	11.01	88.95	56.34
	75.0%		27.05	109.70	12.82	94.53	59.08
	97.5%		37.58	126.20	17.27	105.50	64.24
Sulphur Springs	Mean					64.35	64.35
	SD					6.62	6.62
	2.5%					52.17	52.17
	25.0%					59.80	59.80
	50.0%					64.13	64.13
	75.0%					68.51	68.51
	97.5%					78.24	78.24
Valle Colombia	Mean	16.04	23.28	11.19	8.24	8.68	13.48
	SD	11.24	13.46	5.28	4.48	5.67	6.44
	2.5%	5.41	6.97	4.67	3.29	3.16	6.16
	25.0%	8.51	12.62	6.68	5.02	4.38	7.91
	50.0%	12.34	17.05	9.61	6.84	6.68	12.14
	75.0%	20.09	33.67	15.01	9.96	11.85	17.90
	97.5%	46.35	53.35	23.90	19.62	23.17	27.46
Valles Centrales	Mean	23.52	9.04	53.17	13.59	27.16	25.30
	SD	7.45	6.46	35.46	11.01	19.39	12.60
	2.5%	11.26	1.35	11.19	4.00	2.91	8.68
	25.0%	17.94	3.59	15.59	6.27	7.86	12.04
	50.0%	22.80	8.38	51.62	8.73	25.07	25.15
	75.0%	28.08	12.56	75.87	16.91	42.51	34.07
	97.5%	40.80	25.06	129.10	40.45	67.07	50.22

Ammodramus spp.



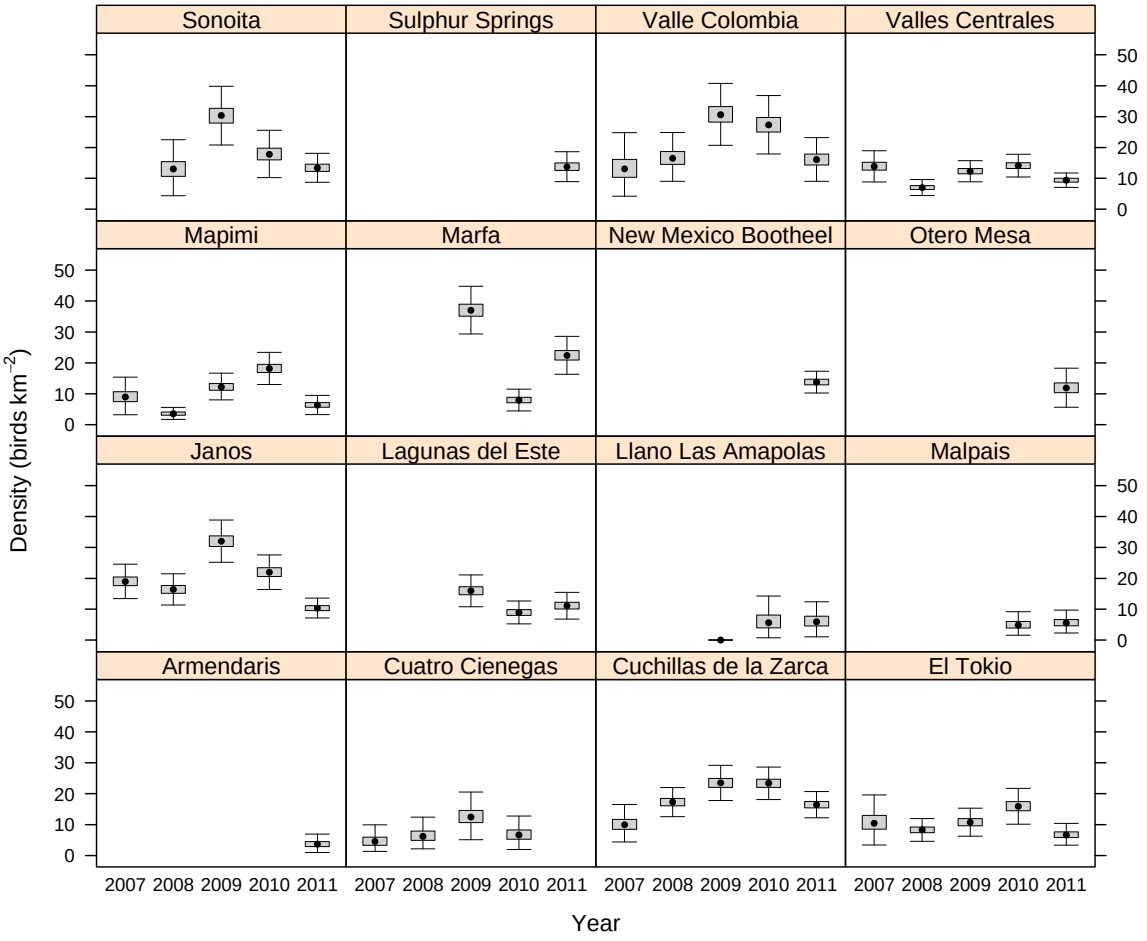


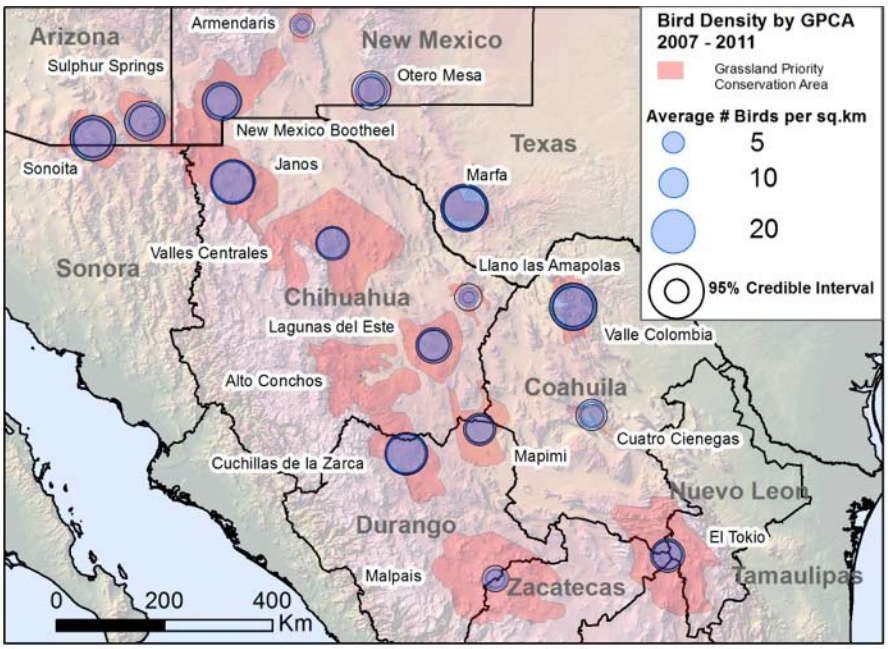
Sturnella spp. (*n* = 2,849)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					3.75	3.75
	SD					1.22	1.22
	2.5%					1.77	1.77
	25.0%					2.84	2.84
	50.0%					3.68	3.68
	75.0%					4.49	4.49
	97.5%					6.43	6.43
Cuatro Ciénegas	Mean	4.74	6.57	12.66	6.87		7.71
	SD	1.84	2.29	3.02	2.28		1.31
	2.5%	1.84	3.21	7.19	3.19		5.47
	25.0%	3.29	4.88	10.64	5.24		6.78
	50.0%	4.57	6.20	12.46	6.64		7.59
	75.0%	5.94	7.88	14.61	8.25		8.52
	97.5%	8.72	12.01	19.07	12.04		10.71
Cuchillas de la Zarca	Mean	10.15	17.33	23.53	23.43	16.47	18.18
	SD	2.33	1.69	2.06	1.95	1.57	0.92
	2.5%	6.13	14.25	19.62	19.72	13.49	16.42
	25.0%	8.47	16.12	22.08	22.08	15.39	17.54
	50.0%	9.96	17.27	23.51	23.40	16.44	18.16
	75.0%	11.67	18.47	24.94	24.71	17.52	18.80
	97.5%	14.98	20.77	27.55	27.40	19.60	20.03
El Tokio	Mean	10.98	8.35	10.84	16.01	6.78	10.59
	SD	3.51	1.41	1.74	2.20	1.35	1.03
	2.5%	5.48	5.87	7.72	12.05	4.38	8.76
	25.0%	8.53	7.35	9.64	14.50	5.82	9.87
	50.0%	10.44	8.28	10.75	15.91	6.67	10.55
	75.0%	12.97	9.20	11.91	17.40	7.65	11.25
	97.5%	19.44	11.45	14.57	20.69	9.63	12.76
Janos	Mean	19.06	16.42	32.08	22.03	10.40	20.00
	SD	2.09	1.82	2.55	2.11	1.18	0.94
	2.5%	15.25	13.04	27.30	18.02	8.24	18.20
	25.0%	17.61	15.14	30.33	20.59	9.56	19.35
	50.0%	18.94	16.39	32.01	21.97	10.35	19.97
	75.0%	20.39	17.66	33.75	23.40	11.17	20.62
	97.5%	23.48	20.11	37.29	26.38	12.84	21.88
Lagunas del Este	Mean			15.99	8.96	11.20	12.05
	SD			1.93	1.39	1.63	1.00
	2.5%			12.41	6.44	8.24	10.17
	25.0%			14.66	8.00	10.08	11.36
	50.0%			15.94	8.90	11.11	12.02
	75.0%			17.25	9.86	12.24	12.71
	97.5%			20.09	11.89	14.63	14.13
Llano Las Amapolas	Mean			0.00	6.42	6.44	4.28
	SD			0.00	3.61	2.70	1.70
	2.5%			0.00	1.36	2.47	1.54
	25.0%			0.00	3.97	4.58	3.08
	50.0%			0.00	5.61	5.94	4.06
	75.0%			0.00	8.09	7.72	5.20
	97.5%			0.00	16.21	13.36	8.52
Malpaís	Mean				5.07	5.69	5.38
	SD				1.52	1.48	1.13
	2.5%				2.67	3.25	3.37
	25.0%				3.93	4.60	4.58
	50.0%				4.85	5.55	5.28
	75.0%				6.04	6.63	6.11
	97.5%				8.48	9.03	7.79

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	9.17	3.58	12.29	18.27	6.42	9.95
	SD	2.36	0.75	1.61	1.94	1.18	0.76
	2.5%	5.12	2.29	9.41	14.71	4.37	8.47
	25.0%	7.46	3.03	11.14	16.90	5.61	9.42
	50.0%	8.95	3.53	12.19	18.18	6.31	9.93
	75.0%	10.64	4.06	13.35	19.52	7.15	10.46
	97.5%	14.42	5.17	15.61	22.37	8.99	11.48
Marfa	Mean			37.10	8.03	22.50	22.54
	SD			2.87	1.35	2.24	1.31
	2.5%			31.64	5.62	18.43	20.08
	25.0%			35.15	7.10	20.92	21.65
	50.0%			37.02	7.93	22.38	22.52
	75.0%			39.01	8.86	23.99	23.40
	97.5%			42.94	11.00	27.10	25.22
New Mexico Bootheel	Mean					13.81	13.81
	SD					1.29	1.29
	2.5%					11.39	11.39
	25.0%					12.91	12.91
	50.0%					13.78	13.78
	75.0%					14.68	14.68
	97.5%					16.45	16.45
Otero Mesa	Mean					12.04	12.04
	SD					2.34	2.34
	2.5%					7.97	7.97
	25.0%					10.37	10.37
	50.0%					11.86	11.86
	75.0%					13.53	13.53
	97.5%					17.15	17.15
Sonoita	Mean		13.32	30.37	17.98	13.47	18.78
	SD		3.87	3.44	2.77	1.70	1.63
	2.5%		6.40	23.88	13.05	10.46	15.77
	25.0%		10.65	27.94	15.98	12.26	17.65
	50.0%		13.02	30.34	17.79	13.38	18.73
	75.0%		15.40	32.68	19.81	14.59	19.82
	97.5%		22.69	37.24	23.85	16.98	22.22
Sulphur Springs	Mean					13.83	13.83
	SD					1.80	1.80
	2.5%					10.64	10.64
	25.0%					12.56	12.56
	50.0%					13.74	13.74
	75.0%					14.98	14.98
	97.5%					17.67	17.67
Valle Colombia	Mean	13.68	16.71	30.81	27.45	16.19	20.97
	SD	4.68	2.98	3.85	3.55	2.75	1.70
	2.5%	6.82	11.56	23.72	20.99	11.16	17.87
	25.0%	10.36	14.51	28.19	24.99	14.34	19.80
	50.0%	13.09	16.48	30.61	27.31	16.06	20.90
	75.0%	16.12	18.66	33.22	29.72	17.87	22.06
	97.5%	24.75	23.20	38.91	34.87	22.23	24.56
Valles Centrales	Mean	13.94	7.05	12.36	14.18	9.43	11.39
	SD	1.90	0.95	1.27	1.40	0.88	0.63
	2.5%	10.47	5.30	10.05	11.58	7.78	10.19
	25.0%	12.64	6.38	11.46	13.22	8.82	10.97
	50.0%	13.86	7.01	12.29	14.12	9.39	11.38
	75.0%	15.17	7.68	13.18	15.07	10.00	11.80
	97.5%	17.90	8.96	15.02	17.06	11.25	12.66

Sturnella spp.



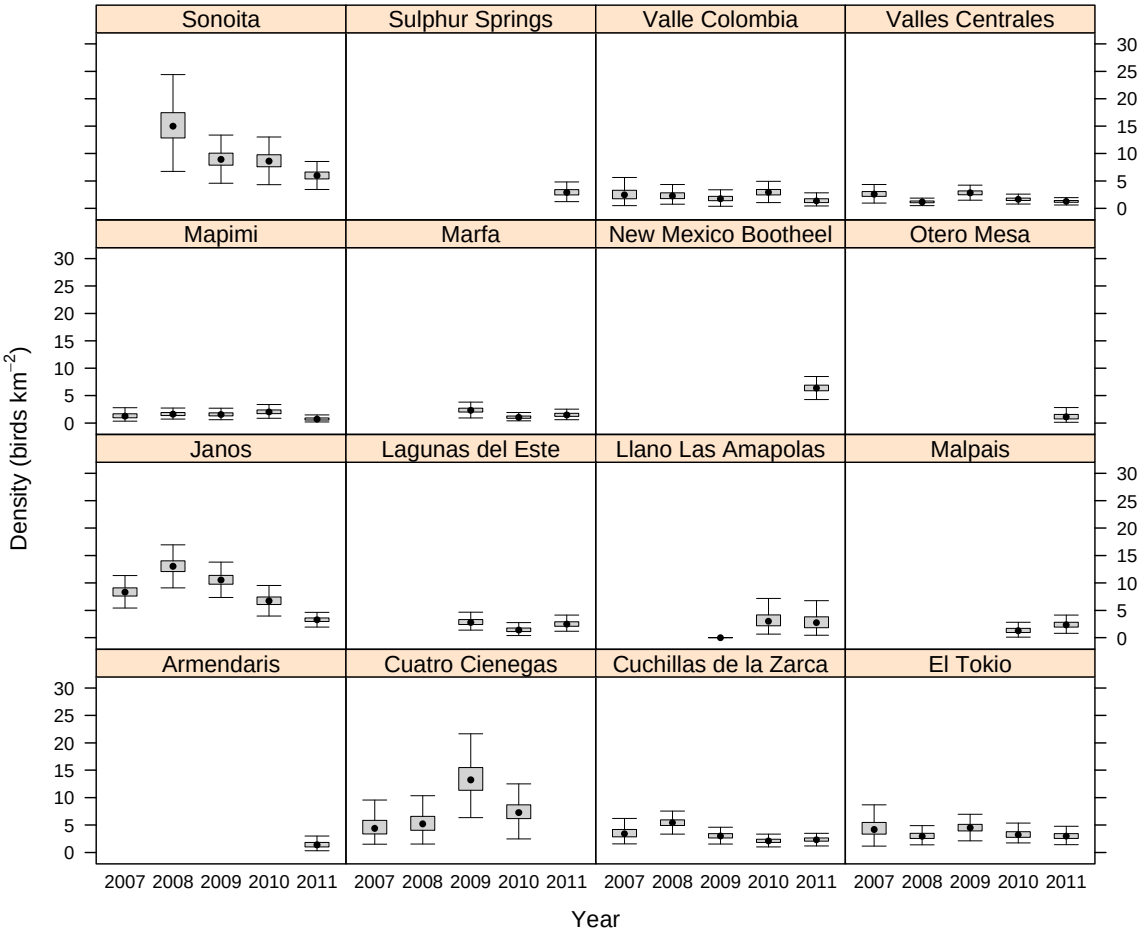


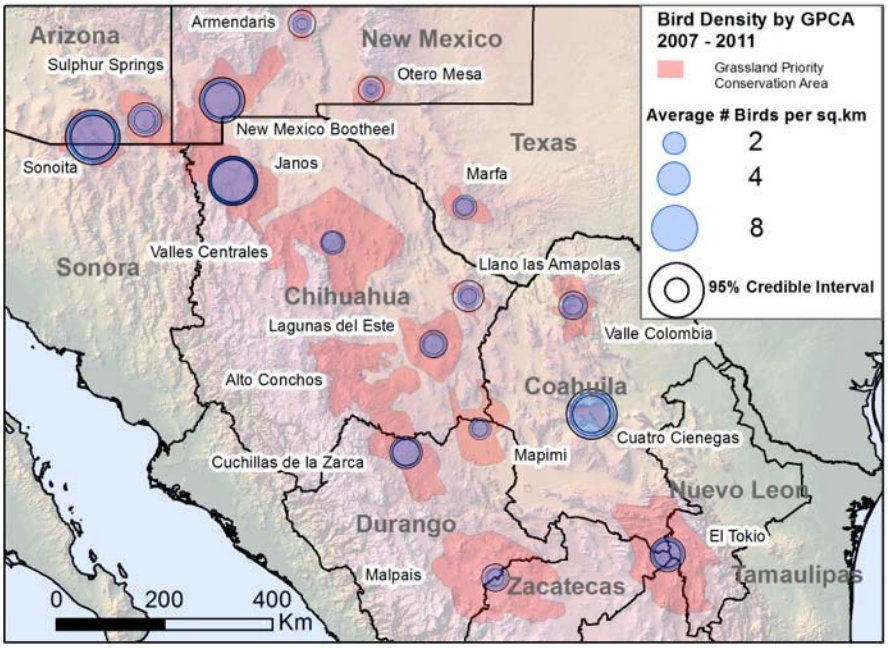
Corvus spp. (*n* = 990)

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Armendaris	Mean					1.47	1.47
	SD					0.66	0.66
	2.5%					0.49	0.49
	25.0%					1.02	1.02
	50.0%					1.40	1.40
	75.0%					1.81	1.81
	97.5%					2.95	2.95
Cuatro Ciénegas	Mean	4.75	5.41	13.50	7.52		7.79
	SD	1.77	1.85	2.86	1.93		1.14
	2.5%	2.22	2.36	8.74	4.41		5.82
	25.0%	3.37	4.06	11.35	6.16		6.97
	50.0%	4.39	5.22	13.25	7.29		7.71
	75.0%	5.85	6.58	15.48	8.69		8.53
	97.5%	8.79	9.37	19.43	11.79		10.24
Cuchillas de la Zarca	Mean	3.60	5.47	3.03	2.13	2.36	3.32
	SD	1.05	0.80	0.59	0.48	0.47	0.36
	2.5%	2.04	4.04	1.95	1.30	1.55	2.68
	25.0%	2.85	4.92	2.63	1.80	2.05	3.08
	50.0%	3.42	5.42	3.02	2.09	2.32	3.30
	75.0%	4.19	5.96	3.42	2.42	2.63	3.53
	97.5%	6.00	7.18	4.25	3.19	3.45	4.12
El Tokio	Mean	4.50	3.05	4.59	3.31	3.02	3.69
	SD	1.57	0.72	0.94	0.74	0.68	0.50
	2.5%	2.09	1.89	2.98	2.12	1.79	2.79
	25.0%	3.35	2.54	3.94	2.75	2.55	3.33
	50.0%	4.18	2.96	4.51	3.23	2.97	3.66
	75.0%	5.48	3.48	5.14	3.79	3.44	4.03
	97.5%	8.17	4.67	6.57	4.91	4.49	4.74
Janos	Mean	8.41	13.09	10.60	6.76	3.30	8.43
	SD	1.14	1.48	1.25	1.02	0.49	0.57
	2.5%	6.46	10.32	8.29	4.88	2.36	7.36
	25.0%	7.61	12.06	9.76	6.04	2.96	8.04
	50.0%	8.31	13.04	10.54	6.73	3.29	8.41
	75.0%	9.11	14.02	11.38	7.45	3.63	8.80
	97.5%	10.91	16.16	13.24	8.83	4.28	9.61
Lagunas del Este	Mean			2.89	1.48	2.54	2.30
	SD			0.67	0.49	0.59	0.36
	2.5%			1.84	0.72	1.56	1.65
	25.0%			2.40	1.11	2.10	2.04
	50.0%			2.79	1.40	2.48	2.28
	75.0%			3.30	1.77	2.91	2.53
	97.5%			4.41	2.58	3.87	3.06
Llano Las Amapolas	Mean			0.00	3.36	2.92	2.09
	SD			0.00	1.62	1.38	0.83
	2.5%			0.00	1.28	0.91	0.94
	25.0%			0.00	2.16	1.83	1.45
	50.0%			0.00	3.00	2.75	1.95
	75.0%			0.00	4.17	3.80	2.59
	97.5%			0.00	7.58	6.01	4.05
Malpaís	Mean				1.37	2.41	1.89
	SD				0.58	0.65	0.47
	2.5%				0.43	1.28	1.11
	25.0%				0.97	1.96	1.57
	50.0%				1.28	2.35	1.86
	75.0%				1.71	2.83	2.19
	97.5%				2.72	3.77	2.93

GPCA	Parameter	2007	2008	2009	2010	2011	Average
Mapimí	Mean	1.38	1.65	1.61	2.09	0.76	1.50
	SD	0.58	0.39	0.42	0.52	0.28	0.25
	2.5%	0.55	0.99	0.93	1.26	0.34	1.06
	25.0%	0.95	1.37	1.31	1.72	0.54	1.32
	50.0%	1.25	1.62	1.56	2.03	0.72	1.48
	75.0%	1.68	1.92	1.87	2.38	0.92	1.66
	97.5%	2.84	2.46	2.54	3.28	1.40	2.04
Marfa	Mean			2.38	1.11	1.52	1.67
	SD			0.54	0.36	0.40	0.28
	2.5%			1.45	0.59	0.87	1.16
	25.0%			2.00	0.86	1.25	1.48
	50.0%			2.33	1.05	1.49	1.65
	75.0%			2.72	1.29	1.76	1.85
	97.5%			3.55	1.99	2.43	2.25
New Mexico Bootheel	Mean					6.42	6.42
	SD					0.78	0.78
	2.5%					5.00	5.00
	25.0%					5.87	5.87
	50.0%					6.39	6.39
	75.0%					6.92	6.92
	97.5%					8.02	8.02
Otero Mesa	Mean					1.22	1.22
	SD					0.59	0.59
	2.5%					0.36	0.36
	25.0%					0.77	0.77
	50.0%					1.12	1.12
	75.0%					1.59	1.59
	97.5%					2.54	2.54
Sonoita	Mean		15.30	9.03	8.72	6.04	9.77
	SD		3.35	1.57	1.62	0.95	1.11
	2.5%		9.76	6.35	5.84	4.32	7.82
	25.0%		12.83	7.86	7.58	5.36	8.98
	50.0%		14.99	8.92	8.62	5.99	9.70
	75.0%		17.45	10.06	9.76	6.64	10.49
	97.5%		22.67	12.42	12.12	8.05	12.09
Sulphur Springs	Mean					2.96	2.96
	SD					0.70	0.70
	2.5%					1.77	1.77
	25.0%					2.45	2.45
	50.0%					2.91	2.91
	75.0%					3.40	3.40
	97.5%					4.50	4.50
Valle Colombia	Mean	2.59	2.35	1.85	2.99	1.43	2.24
	SD	1.18	0.75	0.59	0.78	0.55	0.43
	2.5%	0.77	1.17	0.91	1.64	0.57	1.41
	25.0%	1.75	1.78	1.42	2.45	1.03	1.96
	50.0%	2.47	2.27	1.76	2.93	1.35	2.23
	75.0%	3.30	2.82	2.21	3.44	1.75	2.51
	97.5%	5.39	4.03	3.17	4.74	2.72	3.14
Valles Centrales	Mean	2.66	1.19	2.86	1.67	1.29	1.93
	SD	0.64	0.27	0.51	0.34	0.26	0.22
	2.5%	1.61	0.70	1.99	1.06	0.85	1.53
	25.0%	2.20	1.02	2.48	1.42	1.11	1.77
	50.0%	2.58	1.18	2.82	1.65	1.27	1.92
	75.0%	3.06	1.36	3.18	1.89	1.45	2.08
	97.5%	4.08	1.78	3.95	2.39	1.90	2.39

Corvus spp.


Sonoita
Sulphur Springs
Valle Colombia
Valles Centrales
Mapimi
Marfa
New Mexico Bootheel
Otero Mesa
Janos
Lagunas del Este
Llano Las Amapolas
Malpais
Armendaris
Cuatro Cienegas
Cuchillas de la Zarca
El Tokio
Density (birds km^{-2})
0 5 10 15 20 25 30
2007 2008 2009 2010 2011
Year


Bird Density by GPCA
2007 - 2011
Grassland Priority Conservation Area
Average # Birds per sq.km
2
4
8
95% Credible Interval
Arizona
New Mexico
Texas
Sonora
Chihuahua
Coahuila
Nuevo Leon
Durango
Zacatecas
Tamaulipas
Armendaris
Sulphur Springs
Otero Mesa
New Mexico Bootheel
Sonoita
Janos
Marfa
Valles Centrales
Llano las Amapolas
Lagunas del Este
Valle Colombia
Alto Conchos
Cuatro Cienegas
Mapimi
Cuchillas de la Zarca
El Tokio
Malpais
0 200 400
Km