

LANDFIRE Product Application Summary

Chihuahuan Desert Grassland Bird Habitat Relationships and Abundance

Citations

Pool, D. B., A. Macias-Duarte, A. O. Panjabi, G. Levandoski, and E. Youngberg. 2012. *Chihuahuan Desert Grassland Bird Conservation Plan, version 1.0*. Rocky Mountain Bird Observatory, Brighton, CO, RMBO Technical Report I-RGJV-11-01. 74 pp.

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 INEOTROP- MXPLAT-10-2. 164 pp.

Authors

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Application Location: 30°24'52.97"N, 104°30'45.95"W (near Marfa, TX)

Objective:

Provide science-based guidance to mitigate declines in wild bird populations through habitat protection, restoration and improvement.

Project background and description:

North American Bird Habitat Joint Ventures are responsible for providing science-based guidance to mitigate declines in wild bird populations through habitat protection, restoration and improvement. The breeding regions of North America's central plains are made up of approximately 44.2% grasslands encompassing an area of nearly 2.3 million hectares throughout which grassland birds may disperse. The wintering grounds supporting these same birds are more highly concentrated. The amount of grassland in the Chihuahuan Desert and Sierra Madre Occidental is 16.2% grass or 418,000 hectares in viable habitat area (North American Environmental Atlas; www.cec.org). Grassland birds have less than one-fifth (18.3%) of the area throughout which to disperse during winter compared to their breeding regions. To guide these activities, knowledge of species distribution and abundance is necessary.

Rocky Mountain Bird Observatory (RMBO) developed habitat-specific relationships to bird density for the Grassland Priority Conservation Areas (GPCA) in the U.S. and Mexico. Higher resolution land cover data are required to estimate capacity at the same local level as the

drivers of species density. The authors used 2008 LANDFIRE data in the Texas, New Mexico and Arizona to identify relatively low shrub grasslands based on land cover (existing vegetation type) and fuel models (40 fire behavior fuel models; Table 1). Fuel models represent to some degree biomass and woody vegetation. Combining these parameters allowed us to get a better estimate of open grasslands with lower levels of shrub encroachment versus extant Gap Analysis Program (GAP) or Commission for Environmental Cooperation (CEC) data used for the coarse summaries above. The ability to include shrub level parameters is important to grassland birds, especially at the local scale, since differences between relatively low levels of shrub greatly impact which species may be present, the density of those species and potential winter survival of these birds.

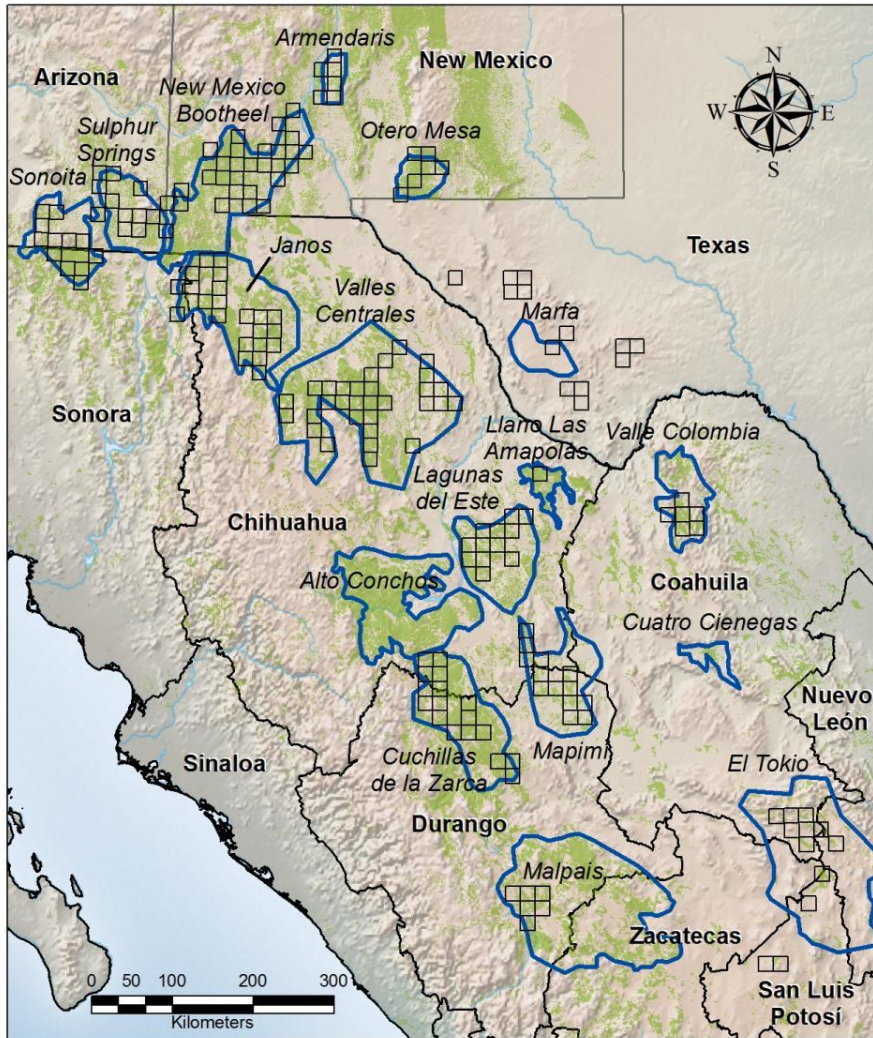
Table 1: Example of data summaries from LANDFIRE used to project local GPCA abundance.

GPCA	Hectares			Total US Area
	Other	Grass	Shrub < 50%	
Armendaris	66,626	18,840	64,538	150,003
Marfa	29,575	18,008	10,268	57,851
Mescalero Sands	13,340	83,399	19,217	115,956
NM Bootheel	29,970	58,687	50,940	139,597
Otero Mesa	10,286	76,355	16,278	102,919
Sonoita	11,296	13,989	17,086	42,371
Sulphur Springs	17,519	22,495	20,067	60,082

The authors surveyed wintering bird communities annually at up to 1,059 randomly-located grassland sites in 17 GPCAs in the Chihuahuan Desert in Mexico and the U.S. between 2007 and 2013 (Figure 1). We used 1-km line-transects with distance-sampling to estimate species' density and characterize vegetation structure. These surveys generated data on habitat conditions and density of 50 grassland obligate or facultative species in the 17 GPCAs, including 29 priority bird species of high regional or continental conservation interest.

Using program distance, plus available GIS data from LANDFIRE and *Instituto Nacional de Estadística y Geografía* (INEGI) corrected by RMBO site verification data, they estimated density and population size for several of the most common passerine grassland bird species wintering in the Chihuahuan Desert for use by Federal, State and non-governmental organization planning and management programs.

Figure 1: This map shows Grassland Priority Conservation Areas in the Chihuahuan Desert (blue boundary), wintering grassland bird sampling blocks surveyed in 2011 (black rectangles) and the extent of desert grasslands (green shading). RMBO sampled birds and estimated several vegetation/cover parameters along transects in these areas (Map by Duane Pool, RMBO).



LANDFIRE products used:

The authors used 2008 LANDFIRE data in the Texas, New Mexico and Arizona to identify relatively low shrub grasslands based on land cover (existing vegetation type or EVT) and fuel models (40 fire behavior fuel models).

Value of the work to the natural resource management/conservation community:

These technical reports estimated the density and population size for several common bird species of the order *Passeriformes* that winter in the Chihuahuan Desert and allowed for the development of habitat-specific relationships to bird density for priority conservation areas in the U.S. and Mexico.

Online supporting information/resources: next page

Chihuahuan Desert Grassland Bird Conservation Plan:

<http://rmbo.org/v3/Portals/0/Documents/International/ChihuahuanDesertGrasslandBirdPlan2012v1.0.pdf>

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

http://rmbo.org/v3/Portals/0/Documents/International/2011_Chihuahuan_Desert_Grassland_Bird_report_with_appendixAB.pdf

Photograph:

Lark bunting at the El Uno Ecological Reserve in the Janos Valley of Chihuahua, Mexico. Photo credit: © Magill Weber/TNC

