Response of Grassland Birds to Agricultural Intensity at Different Spatial Scales in Texas

Anna Matthews  
Texas State University

M. Clay Green  
Texas State University

James Giocomo  
Oaks and Prairies Joint Venture

Follow this and additional works at: http://trace.tennessee.edu/nqsp

Part of the Natural Resources and Conservation Commons

Recommended Citation
Available at: http://trace.tennessee.edu/nqsp/vol8/iss1/43

This Bobwhite Restoration: Approaches and Theory is brought to you for free and open access by Trace: Tennessee Research and Creative Exchange. It has been accepted for inclusion in National Quail Symposium Proceedings by an authorized editor of Trace: Tennessee Research and Creative Exchange. For more information, please contact trace@utk.edu.
RESPONSE OF GRASSLAND BIRDS TO AGRICULTURAL INTENSITY AT DIFFERENT SPATIAL SCALES IN TEXAS

Anna Matthews
Department of Biology, Texas State University, 601 University Dr., Supple Science Building, San Marcos, TX 78666, USA

M. Clay Green
Department of Biology, Texas State University, 601 University Dr., Supple Science Building, San Marcos, TX 78666, USA

James Giocomo
Oaks and Prairies Joint Venture, American Bird Conservancy, 1141 Renaissance Trail, Round Rock, TX 78665, USA

ABSTRACT

The decline in grassland birds is often associated with habitat loss due to intensity of conversion to agricultural lands and the alterations of natural disturbances. We sought to identify agricultural effects at differing scales that correlate to Texas grassland bird abundance, especially northern bobwhite (Colinus virginianus). Ninety-five roadside routes were surveyed in 20 Texas counties ranging from the Oklahoma border to the coastal plains. We conducted point counts in May and June from 2013 to 2016. To estimate the coarse effects of agriculture on bird abundance at a county level, we used number of cattle and area of farmland used per crop type amongst other data from the National Agriculture Statistics Service (NASS, 2012) for analyses. For estimates at finer scales, including the scale of individual routes and points, we obtained annual agricultural data and GIS layers from the NASS. We determined the predictive ability of each agricultural type via linear models and stepwise selection. From 2013 to 2016, we detected 32,373 individual birds, including 5,329 northern bobwhite, from 150,423 point count surveys. Our preliminary results revealed that agriculture only affects a few species at a county level. The top models for rufous-crowned sparrows (Aimophila ruficeps) and field sparrows (Spizella pusilla) included only one predictor from the full model - the number of cattle per county ($R^2 = 0.10; R^2 = 0.29$). The top model for yellow-billed cuckoos (Coccyzus americanus) included cattle per county and year, while the best model was found for dickcissels (Spiza americana), which included year and the proportions of woodland agriculture and pasture ($R^2 = 0.23; R^2 = 0.33$). While our results may indicate that agriculture impacts some species on coarse scales, it appears that bobwhite are likely impacted only on smaller scales and further analysis will be needed to identify specific impacts of agriculture on these scales.

Citation: Matthews, A., M. C. Green, and J. Giocomo. 2017. Response of grassland birds to agricultural intensity at different spatial scales in Texas. National Quail Symposium Proceedings 8:148.

Key words: Colinus virginianus, northern bobwhite, Spiza americana, dickcissel, Coccyzus americanus, yellow-billed cuckoo, Aimophila ruficeps, rufous-crowned sparrow, Spizella pusilla, field sparrow, grassland birds, Texas, agriculture, abundance, scale