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# RESPONSE OF GRASSLAND BIRDS TO AGRICULTURAL INTENSITY AT DIFFERENT SPATIAL SCALES IN TEXAS

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## 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.

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**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

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