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Range Management Practices are Biggest Threat to Grassland Birds

By Craig Volland and Ellie Skokan

Recent studies published by Kansas State University (KSU) biologists identified intensive burning and grazing practices as the biggest threat to grassland birds in the Flint Hills and Smoky Hills regions of Kansas. The broadest study¹ was conducted in the central Flint Hills where the most intensive burning and stocking of grassland typically takes place, another was done at the Konza Prairie Biological Station (KPBS) in Riley County near Manhattan, and two others around the Meridian Way Wind Farm near Concordia.

The greater prairie chicken (GPC) population in the Flint Hills has been in decline since the 1980s. This decline corresponds to the adoption by many landowners of the intensive-early-stocking range management system (IES) whereby very large areas are burned in April of most years and then heavily stocked with cattle.

From 2011 to 2013 KSU biologists collected data on GPC nest selection & survival across Butler, Chase, Greenwood, Lyon and Morris counties. They compared two large areas managed by patch burn grazing (PBG), (Tallgrass Prairie National Preserve and privately-owned Browning Ranch), with 78 properties, about 6 times larger in total area, managed mostly by IES. PBG is a rotational burn management technique that the researchers consider to be “ecologically similar to pre-settlement grazing–fire interactions.” In PBG, typically only one third of the ranch is burned every year.

They found that GPC nest survival was double on the PBG properties and was directly correlated to the amount of vegetative cover. 2012 and 2013 were drought years, so the authors expect that this positive effect will be even greater with normal precipitation, due to more cover for nest concealment. Interestingly, on PBG properties, the cattle stocking density had little effect on nest survival because cattle congregated on the one third of the ranch that was burned, leaving plenty of nesting cover on the remainder. They also noted that PBG results in an accumulation of biomass on unburned patches. This higher fuel load controls encroachment of woody plants when burned in rotation.

In another study of nesting selection and survival, this time for the upland sandpiper at a KPBS site, biologists found that the birds benefited from foraging in burned and grazed plots, but their nest survival was two to three times greater in unburned sites than burned sites. The lowest survival rates were found in units managed with grazing and annual burns.² The reason is the same as with GPC's, i.e., birds nest where the cover is.

The authors said, “Our findings raise concerns for conservation because most native grasslands in the Flint Hills ecoregion are managed with intensive grazing and annual burning.” They urged “new approaches for restoration of heterogeneity of native grasslands and partnerships with private landowners.”

Two other studies measured the response of GPC's to the construction of the Meridian Way Wind Farm near Concordia, which started operation in December of 2008. The authors found some avoidance behavior in use of space by female GPC's.³ However, nest survival was not affected by proximity to wind turbines.⁴ Again researchers found that females preferred nest sites with greater vertical cover. They predicted that, “Changes to rangeland management that improve habitat by doubling vertical cover to 50 centimeters could triple the probability of nest survival from 0.17 to 0.52.” Researchers unexpectedly found that female survival rates actually increased after wind turbines were installed, perhaps because the machines kept predators away from the nests.

As a whole these results are not surprising. Ground-nesting birds, such as the greater prairie chicken and the upland sandpiper, need lots of grass cover to protect themselves and their broods. When frequent, large-scale burns are conducted on rangeland that is then heavily stocked with cattle, the females and their nests are subject to increased predation during breeding season.

These results are also consistent with the Kansas Chapter's advocacy for patch burn grazing and/or burning in alternate seasons as a way to increase diversity in the Flint Hills ecosystem and to decrease the adverse effects of smoke during the burning season. If we are to actually preserve the tall grass prairie in all its elements, landowners need to advance their range management technology to be ecologically compatible, similar to pre-settlement patterns.

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References

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