

Avian Response to Prairie Restoration in the Loess Hills of Western Iowa

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Goals and Objectives:

- Quantify vegetation response to clearing on all avian survey plots.
 - Relate avian habitat use (as measured by species occurrence/abundance) to a gradient of grassland habitat conditions, as defined by local (patch) characteristics and landscape context.
 - Estimate nest success for common grassland bird species and relate variation in nest success to local (around the nest) habitat conditions and landscape context.
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Progress:

All data analyses have been completed, one manuscript has been submitted (see attached), and two manuscripts are now in the final stages of preparation:

- Walker, T. A., and J. Miller. Nest-site selection and reproductive success of grassland songbirds in restored Midwestern prairies. *Condor*.
- Walker, T. A., and J. Miller. Effect of habitat restoration and landscape composition on breeding grassland songbird habitat use in remnant prairies. *Journal of Applied Ecology*.

Conclusions and Recommendations:

A 3-5 year burning cycle has been recommended as optimal for grassland birds. Furthermore, managers have been encouraged to provide a mosaic of burned/unburned, and grazed/ungrazed habitat to maximize the diversity of grassland birds on large sites by providing a wide range of vegetation structure. At the same time, it has been asserted that grassland habitats with 4% cover of woody vegetation begin to benefit edge species over grassland species. Therein is the dilemma in the Loess Hills for grassland bird conservation. The "4%" figure has long ago been exceeded in many locations in this region and sometimes greatly so, as evidenced by the preponderance of woodland and edge species detected during our surveys in 2003 and 2004. Recent analyses of long-term data sets in the Flint Hills of Kansas show that woody vegetation, where it has already become established, may actually increase with five-year burning cycles. At the same time, our results indicate that grazing is associated with more exotic plants and although this may not be an issue for grassland birds, it reduces habitat quality for other taxa. Even though grassland obligate birds tended to reach their highest abundance in grazed areas, at least one species was also experiencing greater rates of nest loss there compared to areas that were burned at Broken Kettle. It will be necessary to focus greater effort on understanding the mechanisms behind this pattern of nest loss before firm conclusions can be drawn as to the relative merits of burning and grazing for nesting birds in the Loess Hills.

It may be difficult to restore some sites south of Broken Kettle to conditions that are suitable for any grassland obligate birds, given limited budgets. These sites may have value for other prairie taxa, however, such as invertebrates, reptiles, or small mammals. Our vegetation data suggest that prairie plant communities may benefit from exploring alternative grazing regimes, or combinations of fire and grazing, as well as greater targeted control of noxious plants and reintroductions of desirable species in some locations.